

# Installing, Configuring, and Upgrading vCloud Availability in the Cloud

VMware vCloud Availability 3.5



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**VMware, Inc.**  
3401 Hillview Ave.  
Palo Alto, CA 94304  
[www.vmware.com](http://www.vmware.com)

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# vCloud Availability Overview in the Cloud



The VMware vCloud Availability solution provides replication and failover capabilities for VMware vCloud Director and vCenter Server workloads at both the virtual machine and at the vApp level.

vCloud Availability is available through the VMware Cloud Provider Program. The solution provides multi-tenant workload recovery to cloud sites and to on-premises environments. vCloud Availability provides:

- A single-cloud site supports multiple-tenants.
- Replication management and monitoring from an on-premises site to a cloud site and reverse.
- Replication and recovery of vApps and virtual machines between vCloud Director sites.
- Failback of recovered in the cloud workloads to the on-premises site.
- Migration of protected virtual machines in the cloud site back to the on-premises site.
- Self-service protection and failover workflows per virtual machine.
- Single installation package as a Photon-based virtual appliance.
- Each deployment can serve as both a source and a recovery site. There are no dedicated source and destination sites.
- Symmetrical replication flow that can be started from either the source or the recovery site.
- A single-site vCloud Availability can migrate virtual machines and vApps between Virtual Data Centers belonging to a single vCloud Director organization.
- Built-in secure tunneling that requires no incoming allowed ports in the firewall in the on-premises site.
- Built-in end-to-end TLS encryption of the replication traffic that is terminated at each vCloud Availability Cloud Replicator Appliance.
- Optional compression of the replication traffic.
- vCloud Availability vSphere Client Plug-In integration with the existing vSphere environment.
- Support for multiple vCenter Server and ESXi versions.
- A single installation package, distributed as a Photon-based virtual appliance to deploy all vCloud Availability components.

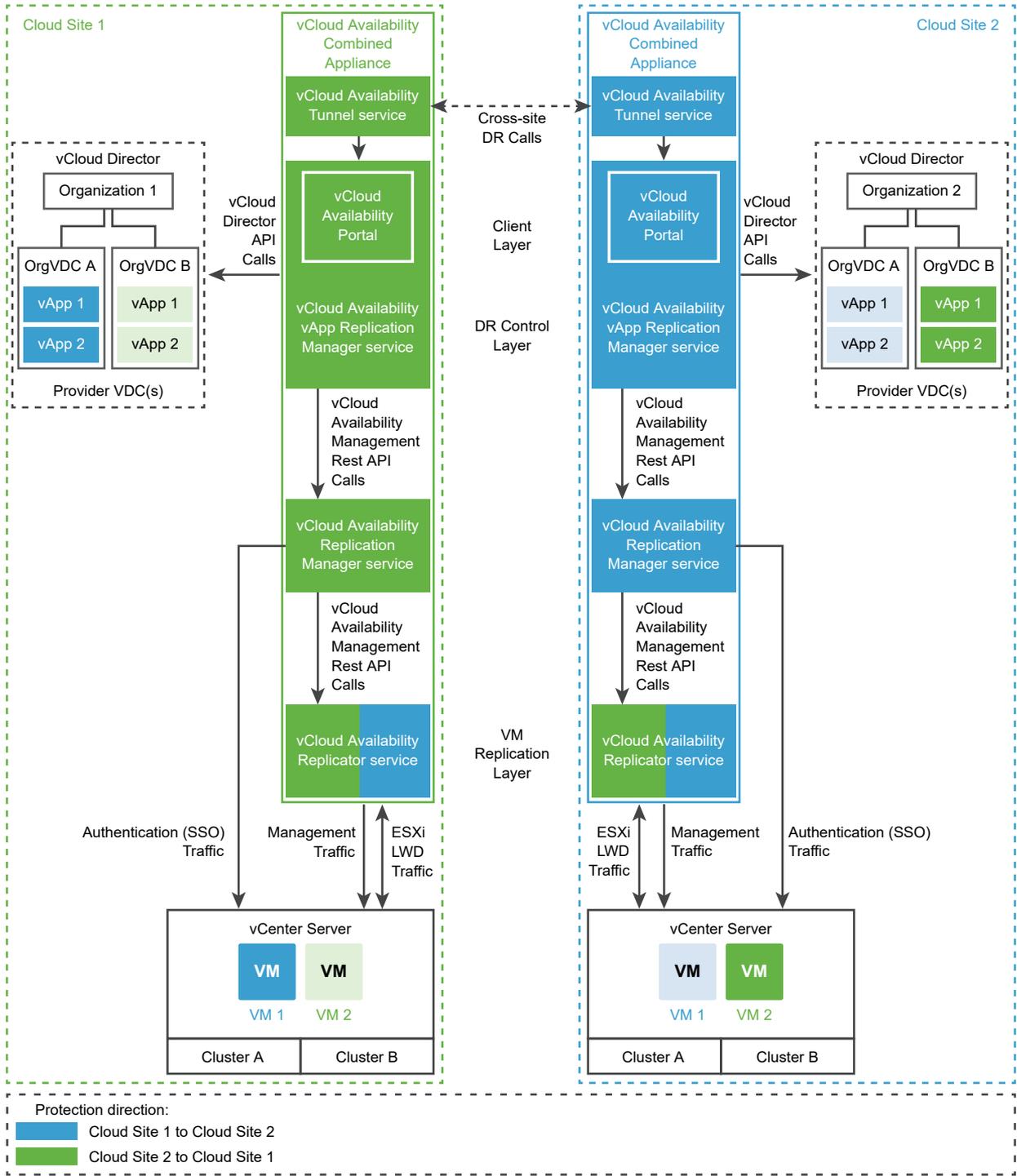
# vCloud Availability Deployment Architecture in the Cloud

# 2

The cloud deployment architecture of vCloud Availability relies on symmetrical replication operations between cloud environments.

## Test and Development Deployment

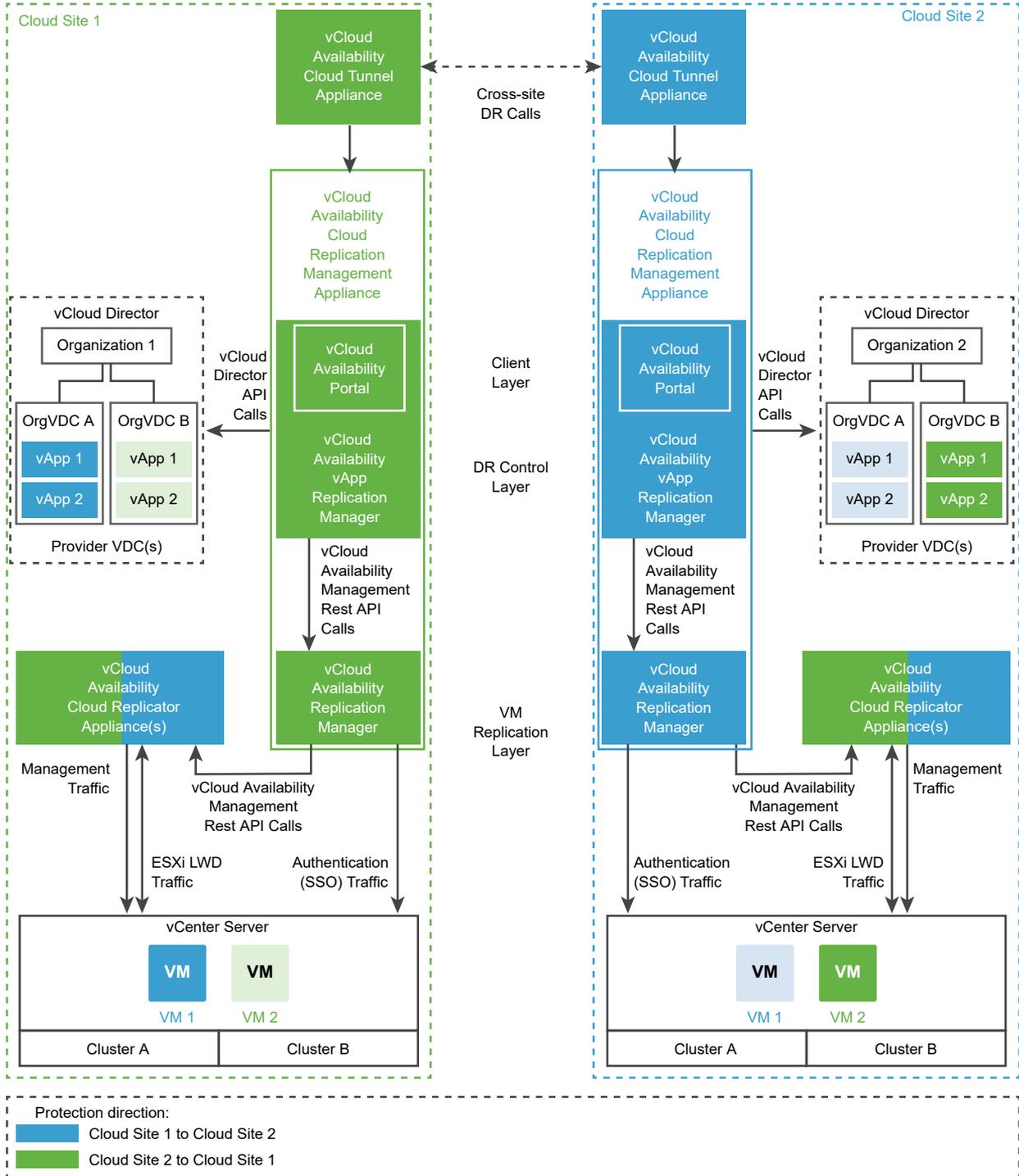
In a test and development environment, you can deploy the simplest architecture. In the cloud site, the vCloud Availability Tunnel service, the vCloud Availability Replication Manager and vCloud Availability vApp Replication Manager service, and the vCloud Availability Replicator service reside on a single vCloud Availability Combined Appliance.



The components with no color in the diagrams represent existing components in the VMware vCloud Director environments. The colored components represent the vCloud Availability services deployed during the installation and initial configuration. The color of the components indicates which services participate for each replication direction. The replication is always placed at the destination site, and a protection from Cloud Site 1 to Cloud Site 2 uses the Cloud Site 2 vCloud Availability services.

# Production Deployment

In a production environment, you deploy and configure a vCloud Availability Cloud Tunnel Appliance, a vCloud Availability Cloud Replication Management Appliance and one or more vCloud Availability Cloud Replicator Appliances.



## Deploying Multiple vCloud Availability Instances in vCloud Director

In a production cloud site, you can deploy one or more vCloud Availability instances, distributed in provider virtual data centers (PVDC). A single vCloud Director instance manages all vCloud Availability instances, for both a replication source or a replication destination.

In vCloud Director, each vCloud Availability instance is registered as a plug-in with its local site name.

In vCloud Availability, each PVDC represents a cloud site and the replication traffic can transit directly and securely between each site. In each vCloud Availability instance, the service provider controls the accessible PVDC.

# vCloud Availability Services

# 3

The services of vCloud Availability can coexist on one virtual appliance or on dedicated appliances.

**Table 3-1. vCloud Availability Services**

Service Name	Service Description
vCloud Availability Replicator	Exposes the low-level HBR primitives as REST APIs.
vCloud Availability Replication Manager	A management service operating with vCenter Server-level concepts for managing the replication workflow.
vCloud Availability vApp Replication Manager with an embedded vCloud Availability Portal	Provides the main interface for replication operations and operates with vCloud Director-level concepts and works with vApps and virtual machines. The embedded vCloud Availability Portal provides the tenants and the service providers of the vCloud Availability Service Provider Portal with a graphic user interface to operate with vCloud Availability.
vCloud Availability Tunnel	The single point that channels all the site traffic: both management and replication data (LWD traffic).

For more information about the vCloud Availability appliances, see [VMware vCloud Availability Deployment Requirements](#).

Each service provides a dedicated service management interface for configuration and administration.

You perform an initial configuration by using the vCloud Availability Replication Manager, the vCloud Availability Replicator, and the vCloud Availability vApp Replication Manager service management interfaces. After vCloud Availability is deployed and configured, tenants can access the vCloud Availability Portal.

**Table 3-2. Replication Services**

Service Name	Service Description
vSphere Replication Server and vSphere Replication Filter	Receives and records the delta information for each replicated workload. During a cloud-to-cloud replication, only the delta information is sent from one ESXi host to another ESXi host.
Lightweight Delta Protocol Service (LWD Proxy)	A proprietary replication protocol service. Verifies that each incoming replication data stream comes only from the authorized source LWD Proxy instance. Also verifies that each outgoing replication data stream goes only to an authorized destination LWD Proxy instance.

**Table 3-3. External Components**

<b>Component Name</b>	<b>Component Description</b>
vCloud Director	Service providers can build secure, multi-tenant private clouds. Pools infrastructure resources into virtual data centers. Exposes them to tenant users through Web portals and programmatic interfaces as fully automated, catalog-based services.
Platform Services Controller	Provides common infrastructure services to the vSphere environment. Services include licensing, certificate management, and authentication with VMware vCenter <sup>®</sup> Single Sign-On.

# Installing and Configuring vCloud Availability

# 4

First you deploy the vCloud Availability appliances. Then you perform an initial configuration of each appliance so that all the components in the disaster recovery infrastructure are visible and able to connect.

This chapter includes the following topics:

- [Installation Requirements in the Cloud](#)
- [Deploying in the Cloud](#)
- [Installation Checklist](#)
- [Configuring vCloud Availability](#)
- [Customer Experience Improvement Program](#)

## Installation Requirements in the Cloud

Before you start deploying and configuring the cloud vCloud Availability appliances, verify that your cloud site environment meets the specific requirements.

### VMware vCloud Availability Deployment Requirements

Before installing vCloud Availability, verify that your environment satisfies the following requirements.

#### Deployment Types and Hardware Requirements

You install all vCloud Availability components by using a single installation OVA file. In all cloud sites, use the same file to deploy all vCloud Availability appliances.

Depending on scale and deployment goals, you can select various deployment types. The following table describes the different deployment types in a cloud site and their hardware requirements.

**Table 4-1. VMware vCloud Availability Cloud Deployment Types**

Appliance Deployment Type	Description	Hardware Requirements
vCloud Availability Cloud Replication Management Appliance	<p>A dedicated appliance deployment type, where a single cloud replication management appliance runs the following services.</p> <ul style="list-style-type: none"> <li>■ vCloud Availability Replication Manager</li> <li>■ vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal</li> </ul> <p>You deploy the cloud replication management appliance to configure replications from and to VMware vCloud Director.</p>	<ul style="list-style-type: none"> <li>■ 2 vCPUs</li> <li>■ 4 GB RAM</li> <li>■ 10 GB Storage</li> </ul>
vCloud Availability Cloud Replicator Appliance	<p>A dedicated vCloud Availability Replicator appliance handles the replication traffic for a site. For large-scale environments, you can deploy more than one vCloud Availability Replicator instance per site.</p>	<ul style="list-style-type: none"> <li>■ 4 vCPUs</li> <li>■ 6 GB RAM</li> <li>■ 10 GB Storage</li> </ul>
vCloud Availability Cloud Tunnel Appliance	<p>A dedicated vCloud Availability Tunnel appliance.</p>	<ul style="list-style-type: none"> <li>■ 2 vCPUs</li> <li>■ 2 GB RAM</li> <li>■ 10 GB Storage</li> </ul>
vCloud Availability Combined Appliance	<p>An all-in-one appliance deployment type, only suitable for testing and evaluation environments. A single combined appliance includes all vCloud Availability services, ready for configuration.</p> <ul style="list-style-type: none"> <li>■ vCloud Availability Replication Manager</li> <li>■ vCloud Availability Replicator</li> <li>■ vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal</li> <li>■ vCloud Availability Tunnel</li> </ul>	<ul style="list-style-type: none"> <li>■ 4 vCPUs</li> <li>■ 6 GB RAM</li> <li>■ 10 GB Storage</li> </ul>

In the on-premises sites, a separate OVA file is used to deploy the vCloud Availability On-Premises Appliance. When installing vCloud Availability on-premises, only a vCloud Availability Replicator service deploys in the vCloud Availability On-Premises Appliance.

## vCloud Availability Deployment Requirements

- Use the resource vCenter Server Lookup service instance, when in a single site several vCenter Server instances are dedicated for different tasks:
  - vCenter Server instances dedicated for management operations.
  - vCenter Server instances dedicated as vCloud Director resources.

vCloud Availability uses the resource vCenter Server instances to locate and authenticate to resources and create or edit inventory objects. Register vCloud Availability Replicator, vCloud Availability vApp Replication Manager, and optionally, vCloud Availability Tunnel and vCloud Availability Replication Manager, with the vCenter Server Lookup service, provided by the Platform Services Controller used by the resource vCenter Server instances.

- Deploy one or more vCloud Availability vApp Replication Manager instances per a vCloud Director server group. The server group in vCloud Director consists of a vCloud Director cell and a resource vCenter Server with at least one ESXi host.

- vCloud Availability verifies the host name of vCloud Director in the vCloud Director certificate. The `CommonName` or at least one of the entries in the `Subject Alternative Name` must match the FQDN or IP of vCloud Director used when registering vCloud Director in vCloud Availability.
- vCloud Director vApps discovery and adoption must be disabled. For more information, see [Discovering and Adopting vApps](#) in the vCloud Director documentation.
- In the ESXi hosts, a VMkernel interface can be dedicated for the replication traffic. By default, ESXi handles the replication traffic through its management VMkernel interface. As a good practice, you can separate the management traffic from the replication traffic by creating a dedicated replication VMkernel interface. Use the following tags when creating a VMkernel interface for the replication traffic:
  - Use the `vSphere Replication` tag to configure the ESXi host for the outgoing replication traffic.
  - Use the `vSphere Replication NFC` tag to configure the ESXi host for the incoming replication traffic.

Configure the replication VMkernel interface in its own IP subnet and connect vCloud Availability Replicator to the same virtual port group. Using this configuration, the replication traffic between the ESXi hosts and the vCloud Availability Replicator instances stays in the same broadcast domain. As a result, uncompressed replication traffic avoids crossing a router and saves the network bandwidth. For information about configuring a dedicated replication VMkernel interface, see [Set Up a VMkernel Adapter for vSphere Replication Traffic on a Source Host](#) in the vSphere Replication documentation.

## vCloud Availability Storage Requirements

For a successful failover, the destination storage must accommodate double the source virtual machine disk size.

- Example required space in the datastore, for a source virtual machine with a 2 TB virtual disk. When the replication is created, vCloud Availability allocates 2 TB in the destination storage. vCloud Availability allocates additional 2 TB when starting a failover task. After finishing the failover task, the additional 2 TB space is unallocated.
- Example for a VMware vSAN storage, with the same virtual machine. The same storage implication applies, where the vSAN must accommodate double the virtual machine disk size. When the replication is created in this example, vCloud Availability allocates 2 TB multiplied by the `vSAN_Protection_Level_Disk_Space_Penalty`. When starting a failover task, additional 2 TB are allocated multiplied by the `vSAN_Protection_Level_Disk_Space_Penalty`. For more information, see [About vSAN Policies](#) and [Planning Capacity in vSAN](#) in the vSphere documentation.

## vCloud Availability Supported Topologies

The resource vCenter Server instances within a vCloud Director site must be within the same single sign-on domain. All vCloud Availability Replicator, vCloud Availability Replication Manager, vCloud Availability vApp Replication Manager, and vCloud Availability Tunnel instances within the respective site must be configured with that same single sign-on domain.

## vCloud Availability Interoperability

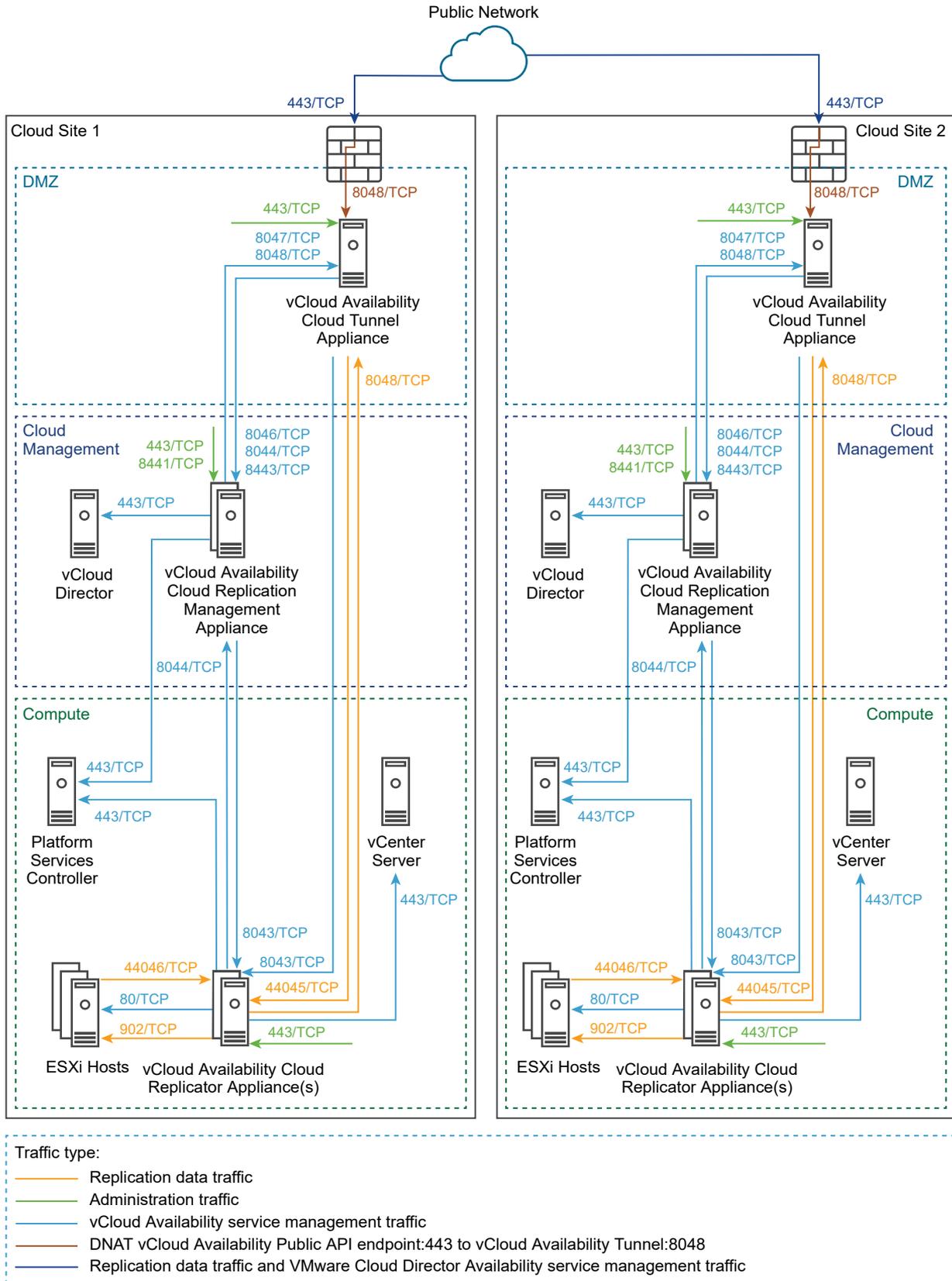
Before installing vCloud Availability, verify the supported versions of ESXi and vSphere. For information about the vCloud Availability interoperability with other VMware products, see [VMware Product Interoperability Matrices](#).

## vCloud Availability Network Ports Requirements

Before you start deploying and configuring vCloud Availability, ensure that the required network ports are opened and allow the vCloud Availability services communication within a site and between cloud sites.

To get a list of the required firewall ports to be opened, see [vCloud-Availability Network Ports](#).

The following network diagram shows the data flow direction, data traffic type, and the required network ports for communication between the vCloud Availability services and the disaster recovery infrastructure for a deployment with two cloud sites.



## Services Connectivity

- The vCloud Availability vApp Replication Manager must have a TCP access to vCloud Director, vCloud Availability Replication Manager, vCenter Server, and to Platform Services Controller, depending on where the vCenter Server Lookup service is hosted.
- The vCloud Availability Replication Manager must have a TCP access to the vCenter Server Lookup service and all the vCloud Availability Replicator instances in both local, and in remote sites.
- The vCloud Availability Replicator must have a TCP access to the vCloud Availability Replication Manager, vCenter Server, and the vCenter Server Lookup service.

**Note** The vCloud Availability services use end-to-end encryption for the communication across sites. For example, when a vCloud Availability Replicator on site 1 is communicating to a vCloud Availability Replicator on site 2, vCloud Availability expects that the TLS session is terminated at each vCloud Availability Replicator.

vCloud Availability does not support any TLS terminating products or solutions placed between the appliances, for example, VMware NSX® Edge™ instances, HAProxy, Nginx, Fortinet, and others. If such solutions are in place, they must be configured in pass-thru mode, also known as TCP mode, to prevent from interfering with the TLS traffic of vCloud Availability.

**Table 4-2. Firewall Rules for External Communication**

Original Destination	Translated Destination	Original Destination Port	DNAT Translated Port	Protocol	Description
Public Network/ Uplink Interface	vCloud Availability Cloud Tunnel Appliance	443	8048	TCP	Used for incoming replication management and replication data traffic from public networks to vCloud Availability Tunnel. The tunnel then routes the traffic to the local services.

## VMware vCloud Availability Users Requirements

Before you start deploying and configuring vCloud Availability, verify that the users comply with the following requirements.

### vCloud Availability vApp Replication Manager Users Requirements

The vCloud Availability vApp Replication Manager distinguishes between admin users and regular users. To start a session with administrator privileges, the credentials you enter for both of the VMware vCloud Director sites must belong to the **ADMINISTRATORS** or **VRADMINISTRATORS** group. For example, the **Administrator@vsphere.local** single sign-on user you enter when logging into the management portal, is a member of the **ADMINISTRATORS** group.

### VMware vCloud Availability User Sessions Requirements

Each vCloud Availability user session is guaranteed to have a VMware vCloud Director user and VMware vCloud Director organization associated with the session.

To manage VMware vCloud Availability objects and the local vCloud Availability vApp Replication Manager appliance as a service provider, you start a user session as a VMware vCloud Director **system administrator** by using VMware vCloud Director user name and password. **System administrator** users can manage any local and monitor any remote VMware vCloud Availability inventory object. To manage VMware vCloud Availability objects in the remote sites, you must authenticate as a system administrator to the remote site.

To perform disaster recovery operations and manage local VMware vCloud Availability objects as a tenant user, you start a user session as a VMware vCloud Director organization administrator by using VMware vCloud Director credentials. As an organization administrator, you can perform disaster recovery operations in the local site, you can manage any local VMware vCloud Availability object, and can monitor any remote VMware vCloud Availability object that belongs to the respective VMware vCloud Director organization. To manage remote VMware vCloud Availability objects, you must authenticate to the corresponding remote organization.

For more information about authenticating to remote sites, see the *Authenticate to Remote Sites as a Service Provider* and *Authenticate to Remote Sites as a Tenant* topics in the *vCloud Availability User's Guide* document.

The following table lists vCloud Availability vApp Replication Manager disaster recovery operations that require sessions on either of the sites, or both.

**Table 4-3. vCloud Availability vApp Replication Manager Replication Operations with Required Sessions**

Operation	Incoming Replication		Outgoing Replication	
	Required Session on Source Site	Required Session on Destination Site	Required Session on Source Site	Required Session on Destination Site
start	Yes	Yes	Yes	Yes
stop	No	Yes	Yes	Yes
reconfigure	No	Yes	Yes	Yes
failover	No	Yes	Yes	Yes
migrate	Yes	Yes	Yes	Yes
sync	No	Yes	Yes	Yes
pause	No	Yes	Yes	Yes
resume	No	Yes	Yes	Yes
reverse	Yes	Yes	Yes	Yes
failover test	No	Yes	Yes	Yes
failover test cleanup	No	Yes	Yes	Yes

## Deploying in the Cloud

In a cloud environment with VMware vCloud Director, you can deploy vCloud Availability. By using a single OVA file, you deploy the vCloud Availability appliances either by using the vSphere Client, or VMware OVF Tool.

The vCloud Availability appliances come as preconfigured virtual machines that are optimized for running the vCloud Availability services.

The vCloud Availability cloud appliances are distributed with a name of the form `VMware-Cloud-Director-Availability-Provider-release.number.xxx-build_number_OVF10.ova`.

### Deploy vCloud Availability by Using the vSphere Client

In the vSphere Client, you can deploy all vCloud Availability services from a single OVA file.

#### Prerequisites

- Download vCloud Availability 3.x Appliance for Cloud Providers (Cloud Sites) as the `VMware-vCloud-Availability-release.number-xxx-build_number_OVF10.ova` file, containing the binaries for the vCloud Availability appliance.
- If using a version of vSphere earlier than 6.5, install the Client Integration Plug-in to use the **Deploy OVF Template** option in the vSphere Web Client.

#### Procedure

- 1 Log in to the vCenter Server by using the vSphere Client.
- 2 Navigate to a target object where you want to deploy the vCloud Availability services.  
As a target object you can use a data center, a folder, a cluster, a resource pool, or a host.
- 3 Right-click the target object and from the drop-down menu select **Deploy OVF Template**.  
The **Deploy OVF Template** wizard opens.
- 4 On the **Select an OVF template** page, browse to the `VMware-vCloud-Availability-release.number-xxx-build_number_OVF10.ova` file location and click **Next**.
- 5 On the **Select a name and folder** page, enter a name for the appliance, select a deployment location, and click **Next**.
- 6 On the **Select a compute resource** page, select a host, or cluster as a compute resource to run the appliance on, and click **Next**.
- 7 On the **Review details** page, verify the OVF template details and click **Next**.
- 8 On the **License agreements** page, select the **I accept all license agreements** check box and click **Next**.
- 9 On the **Configuration** page, select the appliance deployment type configuration and click **Next**.  
For more information about the appliance deployment types, see [VMware vCloud Availability Deployment Requirements](#).

- 10 On the **Select storage** page, select the virtual disk format and the storage policy for the appliance and click **Next**.
- 11 On the **Select networks** page, optionally configure the network settings, then click **Next**.
- 12 On the **Customize template** page, customize the deployment properties of the appliance and click **Next**.

- a Enter and confirm the initial password for the appliance **root** user.

You must change the initial **root** user password when you log in for the first time.

- b Select the **Enable SSH** check box.

If you do not enable SSH, you can configure the appliance later. For more information to allow the SSH access, see the *Administering vCloud Availability* document.

- c In the **NTP Server** section, enter the NTP server address for the appliance to use.

---

**Important** Ensure that all instances of vCenter Server, ESXi, vCloud Director, Platform Services Controller, and all vCloud Availability appliances use the same NTP server.

---

- 13 On the **Ready to complete** page, review the settings, optionally select **Power on after deployment** and to begin the OVA installation process, click **Finish**.

## Results

The **Recent Tasks** pane shows a new task for initializing the OVA deployment. After the task is complete, the new appliance is created on the selected resource.

## Deploying VMware vCloud Availability Services with the VMware OVF Tool

To deploy VMware vCloud Availability services by using the OVF Tool, define deployment parameters and run a deployment script.

### Defining OVF Tool Parameters for VMware vCloud Availability Services Deployment

Before you deploy VMware vCloud Availability services, you must define the specific OVF Tool parameters for deployment.

The following table describes the parameters you must define when deploying VMware vCloud Availability services by using the OVF Tool scripts.

Parameter	Description
OVA	The local client path to the installation OVA package. For example, OVA=" <i>local_client_path</i> /VMware-vCloud-Availability- <i>release_number-xxx-build_number</i> _OVF10.ova".
VMNAME	Virtual machine name.
VSPHERE_DATASTORE	The VSPHERE_DATASTORE value is the datastore name as it is displayed in the .
VSPHERE_NETWORK	The name of the network on which the appliance to run.

Parameter	Description
VSPHERE_ADDRESS	The IP address of the vCenter Server instance on which you deploy the appliance.
VSPHERE_USER	User name for a vCenter Server administrator.
VSPHERE_USER_PASSWORD	Password for a vCenter Server administrator.
VSPHERE_LOCATOR	<p>The VSPHERE_LOCATOR value contains the target data center name, the tag <i>host</i>, the name of the target cluster, and the IP address or the fully qualified domain name (FQDN) of the target ESXi host. The VSPHERE_LOCATOR value depends on the topology of your vSphere environment. Following are examples for valid VSPHERE_LOCATOR values.</p> <ul style="list-style-type: none"> <li>■ <i>/data-center-name/host/cluster-1-name/ESXi-host-fully-qualified-domain-name</i></li> <li>■ <i>/data-center-name/host/cluster-2-name/ESXi-host-IP-address</i></li> </ul> <p>If the target ESXi host is not part of a cluster, skip the <i>cluster-name</i> element, as shown in the following examples.</p> <ul style="list-style-type: none"> <li>■ <i>/data-center-name/host/ESXi-host-fully-qualified-domain-name</i></li> <li>■ <i>/data-center-name/host/ESXi-host-IP-address</i></li> </ul> <p>For more information about the VSPHERE_LOCATOR value, run the <code>./ovftool --help locators</code> command.</p>

## Deploy VMware vCloud Availability Services by Using the OVF Tool

In the OVF tool console, you can use a single installation OVA file to deploy all VMware vCloud Availability services. You define deployment parameters in the OVF Tool console and run the deployment script.

### Prerequisites

- Download the vCloud Availability 3.0.x Appliance for Cloud Providers (Cloud Sites) VMware-vCloud-Availability-release\_number-xxx-build\_number\_OVF10.ova file, containing the binaries for the VMware vCloud Availability appliance.
- Verify that the OVF Tool is installed and configured.

### Procedure

- 1 Log in to a server where the OVF Tool is running, by using a Secure Shell (SSH) client.
- 2 Define deployment parameters in the OVF Tool console by running the following commands.

```
# VMNAME="Name-to-be-Assigned-to-the-VM"

# VSPHERE_DATASTORE="vSphere-datastore"

# VSPHERE_NETWORK="VM-Network"

# OVA="local_client_path/VMware-vCloud-Availability-release_number-xxx-build_number_OVF10.ova"

# VSPHERE_USER="vCenter-Server-admin-user"

# VSPHERE_USER_PASSWORD="vCenter-Server-admin-user-password"

# VSPHERE_ADDRESS="vCenter-Server-IP-address"

# VSPHERE_LOCATOR="vSphere-locator"
```

### 3 Deploy a VMware vCloud Availability appliance.

Use the `--deploymentOption` argument to specify the deployment type for the appliance you are deploying.

The following example command deploys a combined VMware vCloud Availability appliance and sets a static IP address.

```
#./ovftool/ovftool --name="{VMNAME}" --datastore="{VSPHERE_DATASTORE}" --acceptAllEulas
--powerOn --X:enableHiddenProperties --X:injectOvfEnv --X:waitForIp
--ipAllocationPolicy=fixedPolicy --deploymentOption=combined --machineOutput --noSSLVerify
--overwrite --powerOffTarget "--net:VM Network={VSPHERE_NETWORK}" --diskMode=thin
--prop:guestinfo.cis.appliance.root.password='Your-Root-Password'
--prop:guestinfo.cis.appliance.ssh.enabled=True
--prop:guestinfo.cis.appliance.net.ntp='Your-ntp-server-ip-address'
--prop:vami.DNS.VMware_vCloud_Availability='Your-DNS-Server-Address'
--prop:vami.domain.VMware_vCloud_Availability='Your-Domain-Name'
--prop:vami.gateway.VMware_vCloud_Availability='Your-Gateway-IP-Address'
--prop:vami.ip0.VMware_vCloud_Availability='IP-to-be-Assigned-to-the-Appliance'
--prop:vami.netmask0.VMware_vCloud_Availability='Your-Netmask-Address'
--prop:vami.searchpath.VMware_vCloud_Availability='Your-Search-Path-Address'
"{OVA}" "vi://{VSPHERE_USER}:{VSPHERE_USER_PASSWORD}@{VSPHERE_ADDRESS}{VSPHERE_LOCATOR}"
```

The console outputs the IP address of the VMware vCloud Availability appliance.

## Installation Checklist

Follow the interactive installation checklist that guides you through the required steps of the installation process.

The interactive installation checklist guides you through the required steps to set up all vCloud Availability appliances.

The installation checklist is available in a vCloud Availability Cloud Replication Management Appliance or in a vCloud Availability Combined Appliance.

## Use the Installation Checklist

To follow a complete setup guide, you can use the interactive installation checklist.

### Procedure

- 1 Log in to the management interface of the vCloud Availability Cloud Replication Management Appliance.
  - a In a Web browser, go to `https://Appliance-IP-Address/ui/admin`.
  - b Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
  - c Click **Login**.

- 2 If you did not complete the initial setup wizard, on the **Getting Started** page click the **Access the installation checklist** link.

Alternatively, navigate your browser to `https://Appliance-IP-Address/ui/guide/checklist`.

- 3 In the **Select Installation Type** page, select the deployment type of the appliance and click **Next**.

The **Installation and configuration checklist** page opens and the installation checklist highlights the installation step that is pending. For more information, see [Configuring vCloud Availability](#).

- 4 Perform the highlighted procedure in the step and when you are ready, mark it as completed by clicking **Done**.

The installation checklist verifies the configuration for some of the steps and provides you with feedback.

- 5 Follow the remaining steps through the end of the installation checklist. When you complete all steps, you see the following confirmation message:

You have completed all installation steps.

## Resume an Incomplete Installation

Closing the installation checklist at any time does not interrupt the installation progress. Resume following the steps at a later stage by returning to the installation checklist. The installation checklist shows the current installation state, verifies the completed steps, and shows the remaining steps to complete the installation.

### Prerequisites

### Procedure

- 1 To return to the installation checklist, in the browser go to the following address, depending on the appliance deployment type.

Appliance Deployment Type	Installation Checklist URL
vCloud Availability Combined Appliance	<code>https://Appliance-IP-Address/ui/guide/checklist/combined</code>
vCloud Availability Cloud Replication Management Appliance	<code>https://Appliance-IP-Address/ui/guide/checklist/dedicated</code>

The installation checklist shows the completed and verified steps.

- 2 Resume the installation with the pending step highlighted by the installation checklist. When you are ready, to mark the step as completed click **Done**.

The installation checklist verifies the configuration for some of the steps and provides you with feedback.

- 3 Follow the remaining steps through the end of the installation checklist. When you complete all steps, you see the following confirmation message:

You have completed all installation steps.

## Configuring vCloud Availability

To configure the VMware vCloud Availability solution, in a single site perform an initial configuration of vCloud Availability Replication Manager, vCloud Availability vApp Replication Manager, vCloud Availability Replicator and vCloud Availability Tunnel, register the services in the site, and pair cloud sites.

As a best practice, configure all services in one site, register the vCloud Availability Replicator instance with the vCloud Availability Replication Manager instance in the same site, and to allow for pairing, perform an initial configuration and registration of the second site.

After configuring a vCloud Availability service, you can validate that the setup is complete by opening the service management interface to the **System Monitoring** page. On that page, the entries are green to indicate successfully configured services, and red entries indicate an incomplete setup.

### Procedure

- 1 [Configure a vCloud Availability vApp Replication Manager Instance](#)

Enter a site name to use as an identifier of the vCloud Availability vApp Replication Manager instance and register the vCloud Availability vApp Replication Manager with a vCenter Server Lookup service, and with a VMware vCloud Director instance.

- 2 [Configure the vCloud Availability Replication Manager](#)

Register the vCloud Availability Replication Manager with the vCenter Server Lookup service.

- 3 [Configure a vCloud Availability Replicator Instance](#)

Register the vCloud Availability Replicator with a vCenter Server Lookup service.

- 4 [Register the vCloud Availability Replicator with the vCloud Availability Replication Manager in the Cloud Site](#)

Register the vCloud Availability Replicator with the vCloud Availability Replication Manager in the same cloud site.

- 5 [Configure a vCloud Availability Tunnel Instance](#)

Change the initial password of the vCloud Availability Tunnel appliance **root** user. Optionally, to allow a single sign-on login to the vCloud Availability Tunnel, register the vCloud Availability Tunnel with a vCenter Server Lookup service.

- 6 [Enable a vCloud Availability Tunnel Instance](#)

Register the vCloud Availability Tunnel with the vCloud Availability vApp Replication Manager.

## 7 Add an Additional vCloud Availability Replicator Instance

Depending on your deployment requirements, you can add more vCloud Availability Replicator instances to your disaster recovery environment.

### Configure a vCloud Availability vApp Replication Manager Instance

Enter a site name to use as an identifier of the vCloud Availability vApp Replication Manager instance and register the vCloud Availability vApp Replication Manager with a vCenter Server Lookup service, and with a VMware vCloud Director instance.

#### Procedure

- 1 In a Web browser, navigate to **https://Appliance-IP-Address/ui/admin**.

The service management interface of vCloud Availability vApp Replication Manager opens the login page.

- 2 Log in by using the **root** user password that you set during the OVA deployment.
- 3 If you log in to the appliance for the first time, you must change the initial **root** user password.

- a Enter the initial **root** user password that you set during the OVA deployment.

- b Enter and confirm a new password.

The password that you enter must be a secured password with a minimum of eight characters and it must consist of:

- At least one lowercase letter.
- At least one uppercase letter.
- At least one number.
- At least one special character, such as & # %.

- c Click **Apply**.

The **Getting Started** tab opens.

- 4 Click **Run initial setup wizard**.

The **Initial Setup** wizard opens.

- 5 On the **Site Details** page, enter a **Site Name**, optionally enter a **Site Description**, and click **Next**.

---

**Important** The site name is used as an identifier of this instance of vCloud Availability vApp Replication Manager and cannot be changed later.

---

- 6 On the **Lookup Service** page, enter the **lookup-service-IP-address**.
  - a Press Tab and autocomplete the address as `https://Lookup-Service-IP-address:443/lookupservice/sdk`.
  - b Click **Next**.
  - c Accept the SSL certificate of the vCenter Server Lookup service.
- 7 On the **vCloud Director** page, install the vCloud Availability plug-in for vCloud Director.
  - a Enter the vCloud Director URL as `https://vCloud Director-IP-address:443/api`.
  - b Enter a vCloud Director **System administrator** credentials, for example use `administrator@system`.
  - c Click **Next**.
  - d Accept the SSL certificate of the vCloud Director instance.
- 8 On the **Licensing** page, enter a valid VMware vCloud Availability license key and click **Next**.
- 9 (Optional) On the **CEIP** page, to **Join the VMware Customer Experience Improvement Program**, select the check box and click **Next**.

For more information on the VMware Customer Experience Improvement Program, see [Customer Experience Improvement Program](#).
- 10 On the **Ready To Complete** page, review the vCloud Availability vApp Replication Manager configuration summary and click **Finish**.
- 11 Verify that the vCloud Availability vApp Replication Manager configuration is correct.
  - a In the left pane, click **System Monitoring**.
  - b Under **Service status**, verify that **Lookup Service connectivity** shows a green check status.
  - c On the **System Monitoring** page, you can see the remaining configurations to complete the vCloud Availability vApp Replication Manager service configuration.

#### What to do next

You can now perform an initial configuration of vCloud Availability Replication Manager. For more information, see [Configure the vCloud Availability Replication Manager](#).

## Configure the vCloud Availability Replication Manager

Register the vCloud Availability Replication Manager with the vCenter Server Lookup service.

#### Procedure

- 1 In a Web browser, go to `https://Appliance-IP-Address:8441/ui/admin`.
- 2 Log in as the **root** user.
- 3 In the left pane, click **Configuration** and next to **Lookup service address** click **Edit**.

- 4 In the **Lookup Service Details** window, enter the vCenter Server Lookup service address.
  - a Press Tab and autocomplete the address as `https://Lookup-Service-IP-address:443/lookupservice/sdk`.
  - b Click **Apply**.
  - c Accept the SSL certificate of the vCenter Server Lookup service.
- 5 Verify that the vCenter Server Lookup service connectivity is operational.
  - a In the left pane, click **System Monitoring**.
  - b Under **Service status**, verify that **Lookup Service connectivity** shows a green check status.

#### What to do next

You can now perform an initial configuration of vCloud Availability Replicator. For more information, see [Configure a vCloud Availability Replicator Instance](#).

## Configure a vCloud Availability Replicator Instance

Register the vCloud Availability Replicator with a vCenter Server Lookup service.

#### Procedure

- 1 In a Web browser, go to the vCloud Availability Replicator service management interface for your deployment type.

Deployment type	Service Management Interface
vCloud Availability Combined Appliance	<code>https://Appliance-IP-Address:8440/ui/admin</code>
vCloud Availability Cloud Replicator Appliance	<code>https://Replicator-Appliance-IP-Address/ui/admin</code>

- a Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
- b Click **Login**.

- 2 If you log in to the appliance for the first time, you must change the initial **root** user password.
  - a Enter the initial **root** user password that you set during the OVA deployment.
  - b Enter and confirm a new password.

The password that you enter must be a secured password with a minimum of eight characters and it must consist of:

- At least one lowercase letter.
  - At least one uppercase letter.
  - At least one number.
  - At least one special character, such as & # %.
- c Click **Apply**.

The **Getting Started** tab opens.

- 3 In the left pane, click **Configuration** and next to **Lookup service address** click **Edit**.
- 4 In the **Lookup Service Details** window, enter the vCenter Server Lookup service address.
  - a Press Tab and autocomplete the address as `https://Lookup-Service-IP-address:443/lookupservice/sdk`.
  - b Click **Apply**.
  - c Accept the SSL certificate of the vCenter Server Lookup service.
- 5 Verify that the vCenter Server Lookup service connectivity is operational.
  - a In the left pane, click **System Monitoring**.
  - b Under **Service status**, verify that **Lookup Service connectivity** shows a green check status.

#### What to do next

You can now register vCloud Availability Replicator with vCloud Availability Replication Manager. For more information, see [Register the vCloud Availability Replicator with the vCloud Availability Replication Manager in the Cloud Site](#).

## Register the vCloud Availability Replicator with the vCloud Availability Replication Manager in the Cloud Site

Register the vCloud Availability Replicator with the vCloud Availability Replication Manager in the same cloud site.

#### Prerequisites

Verify that in the same site you have configured a vCloud Availability Replicator instance and a vCloud Availability Replication Manager instance.

## Procedure

- 1 Log in to the vCloud Availability Replication Manager service management interface.
  - a In a Web browser, go to `https://Appliance-IP-Address:8441/ui/admin`.
  - b Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
  - c Click **Login**.
- 2 In the left pane, click **Replicators**.
- 3 On the **Replicators administration** page, click **New**.
- 4 In the **New Replicator** window, enter the details for the new vCloud Availability Replicator instance and click **Add**.

Option	Description
Site	Select the site where the vCloud Availability Replicator instance is deployed.
Description	You can optionally add a description for the vCloud Availability Replicator instance you register.
API URL	The vCloud Availability Replicator instance API endpoint address.
Appliance Password	The <b>root</b> user password for the vCloud Availability Replicator appliance.
SSO Admin Username	A user with administrative privileges in the local site single sign-on domain, for example <i>Administrator@VSPHERE.LOCAL</i> .
SSO Password	The password for the administrative user.

If you enter the FQDN of vCloud Availability Replicator, the interface always shows the IP address of vCloud Availability Replicator.

- 5 Accept the SSL certificate of the vCloud Availability Replicator.
 

On the **Replicators administration** page, you now see a green check status for the new vCloud Availability Replicator instance added to the vCloud Availability Replication Manager instance.
- 6 Verify that the vCloud Availability Replicator connectivity is operational.
  - a In the left pane, click **System Monitoring**.
  - b Under **Local replicators**, verify that **Service connectivity** shows a green check status.

## Configure a vCloud Availability Tunnel Instance

Change the initial password of the vCloud Availability Tunnel appliance **root** user. Optionally, to allow a single sign-on login to the vCloud Availability Tunnel, register the vCloud Availability Tunnel with a vCenter Server Lookup service.

## Procedure

- 1 In a Web browser, go to the vCloud Availability Tunnel service management interface for your deployment type.

Deployment type	Service Management Interface
vCloud Availability Combined Appliance	<code>https://Appliance-IP-Address:8442/ui/admin</code>
vCloud Availability Cloud Tunnel Appliance	<code>https://Tunnel-Appliance-IP-Address/ui/admin</code>

- a Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
- b Click **Login**.

- 2 If you log in to the appliance for the first time, you must change the initial **root** user password.

- a Enter the initial **root** user password that you set during the OVA deployment.
- b Enter and confirm a new password.

The password that you enter must be a secured password with a minimum of eight characters and it must consist of:

- At least one lowercase letter.
- At least one uppercase letter.
- At least one number.
- At least one special character, such as & # %.

- c Click **Apply**.

The **Getting Started** tab opens.

- 3 In the left pane, click **Configuration** and next to **Lookup service address** click **Edit**.

- 4 (Optional) In the **Lookup Service Details** window, enter the vCenter Server Lookup service address.

- a Press Tab and autocomplete the address as `https://Lookup-Service-IP-address:443/lookupservice/sdk`.
- b Click **Apply**.
- c Accept the SSL certificate of the vCenter Server Lookup service.

- 5 (Optional) Verify that the vCenter Server Lookup service connectivity is operational.

- a In the left pane, click **System Monitoring**.
- b Under **Service status**, verify that **Lookup Service connectivity** shows a green check status.

## What to do next

You can now enable the tunneling service communication with VMware vCloud Availability services. For more information, see [Enable a vCloud Availability Tunnel Instance](#).

## Enable a vCloud Availability Tunnel Instance

Register the vCloud Availability Tunnel with the vCloud Availability vApp Replication Manager.

### Prerequisites

- Verify that in all cloud sites the vCloud Availability Replicator instance is locally registered to the vCloud Availability Replication Manager instance, before registering vCloud Availability vApp Replication Manager instances in all cloud sites with vCloud Availability Tunnel to enable the tunneling service communication.
- Verify that the vCloud Availability Tunnel instance is configured. For more information, see [Configure a vCloud Availability Tunnel Instance](#).

### Procedure

- 1 Log in to the management interface of the vCloud Availability Cloud Replication Management Appliance.
  - a In a Web browser, go to `https://Appliance-IP-Address/ui/admin`.
  - b Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
  - c Click **Login**.
- 2 In the left pane, click **Configuration** and next to **Tunnel address** click **Edit**.  
The **Tunneling settings** window opens.
- 3 Edit the vCloud Availability Tunnel settings and click **Apply**.

Option	Description
Enable tunneling for vCloud Availability services communication	Select to enable vCloud Availability Tunnel.
Tunnel address	Enter the local vCloud Availability Tunnel service API endpoint. By default, this address is with port <b>8047</b> . For example, <b>https://Tunnel-Appliance-IP-address:8047</b> .
Appliance user	The vCloud Availability Tunnel appliance <b>root</b> user.
Password	The password for the vCloud Availability Tunnel appliance <b>root</b> user.

- 4 Accept the vCloud Availability Tunnel SSL certificate.
- 5 Verify that the vCloud Availability Tunnel connectivity is operational.
  - a In the left pane, click **System Monitoring**.
  - b Under **Service status**, verify that **Tunnel connectivity** shows a green status.

### What to do next

If you paired sites before enabling vCloud Availability Tunnel, you must re-pair all sites.

## Add an Additional vCloud Availability Replicator Instance

Depending on your deployment requirements, you can add more vCloud Availability Replicator instances to your disaster recovery environment.

### Prerequisites

- Configure the vCloud Availability Replicator, vCloud Availability Replication Manager, vCloud Availability vApp Replication Manager, and the vCloud Availability Tunnel in your environment.
- Deploy a new vCloud Availability Replicator appliance. For more information, see [Deploy vCloud Availability by Using the vSphere Client](#) and [Deploy VMware vCloud Availability Services by Using the OVF Tool](#).
- Configure the new vCloud Availability Replicator appliance. For more information, see [Configure a vCloud Availability Replicator Instance](#).
- Register the new vCloud Availability Replicator appliance to the local vCloud Availability Replication Manager appliance. For more information, see [Register the vCloud Availability Replicator with the vCloud Availability Replication Manager in the Cloud Site](#).

### Procedure

- 1 Add a vCloud Availability Replicator instance.
  - a In a Web browser, go to `https://Cloud-Replication-Management-Appliance-IP-address:8441/ui/admin`.
  - b Log in as **root**.
  - c In the left pane, click **Replicators**.
  - d In the **Replicators administration** page, click **New**.  
The **New Local Replicator** window shows.
    - e In the **API URL** text box, enter the vCloud Availability Replicator appliance address and port **8043**.  
For example, `https://Cloud-Replicator-Appliance-IP-address:8043`.
    - f In the **Appliance Password** text box, enter the appliance **root** password that you set during the initial vCloud Availability Replicator configuration.
    - g Enter the single sign-on domain administrator user name and password.  
For example, use `administrator@vsphere.local`.
    - h (Optional) In the **Description** text box, add a description for the vCloud Availability Replicator.
    - i Click **Add**.
    - j Verify the thumbprint and accept the vCloud Availability Replicator SSL certificate.

- 2 Register the vCloud Availability Tunnel appliance to the new vCloud Availability Replicator by re-enabling the tunnel.
  - a In a Web browser, go to `https://Cloud-Replication-Management-Appliance-IP-address/ui/admin`.
  - b Log in as **root**.
  - c In the left pane, click **Configuration**.
  - d Under **Service endpoints**, next to **Tunnel address** click **Edit**.
  - e In the **Tunneling Settings** window, enter the password for the vCloud Availability Tunnel appliance and click **Apply**.
  - f If you are running vCloud Availability 3.x, restart the new vCloud Availability Replicator instance.
- 3 Re-pair the cloud site with all paired cloud sites and all paired on-premises sites.

### Results

A new vCloud Availability Replicator instance is added to the vCloud Availability environment.

### What to do next

- To use the new vCloud Availability Replicator instance, re-pair all sites.
- To add another vCloud Availability Replicator instance, repeat this procedure.

## Customer Experience Improvement Program

You can configure VMware vCloud Availability to participate in VMware's Customer Experience Improvement Program ("CEIP"). When you join CEIP, VMware receives anonymous information to improve the quality, reliability, and functionality of VMware products and services.

This product participates in VMware's Customer Experience Improvement Program ("CEIP"). Details regarding the data collected through CEIP and the purposes for which it is used by VMware are set forth at the Trust & Assurance Center at <http://www.vmware.com/trustvmware/ceip.html>. To join or leave the CEIP for this product, please see [Join or Leave the Customer Experience Improvement Program](#).

### Categories of Information That VMware Receives

This product participates in VMware's Customer Experience Improvement Program ("CEIP").

Details regarding the data collected through CEIP and the purposes for which it is used by VMware are set forth at the Trust & Assurance Center at <http://www.vmware.com/trustvmware/ceip.html>.

To join or leave the CEIP for this product, please see [Join or Leave the Customer Experience Improvement Program](#).

### Join or Leave the Customer Experience Improvement Program

You can configure vCloud Availability to join the Customer Experience Improvement Program (CEIP), or leave the CEIP at any time.

## Procedure

- 1 Log in to the management interface of the vCloud Availability Cloud Replication Management Appliance.
  - a In a Web browser, go to `https://Appliance-IP-Address/ui/admin`.
  - b Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
  - c Click **Login**.
- 2 In the left pane, click **Configuration**.
- 3 Under **Customer Experience Improvement Program participation**, next to **Participate in CEIP** click **Edit**.
- 4 In the **Participate in CEIP** window, to join or leave the CEIP for this product, please configure the following and click **Apply**.
  - To join the CEIP, select the **Join the VMware Customer Experience Improvement Program** check box.
  - To leave the CEIP, deselect the **Join the VMware Customer Experience Improvement Program** check box.

# Upgrading vCloud Availability in the Cloud

# 5

Follow the upgrade path and use an upgrade method according to the current vCloud Availability version. Then select a source repository for the upgrade files and upgrade each vCloud Availability appliance in the cloud site, according to a specific order.

## Upgrade Paths

To upgrade to the latest version, use the following upgrade methods according to the current vCloud Availability version.

**Table 5-1.**

Currently Installed vCloud Availability Version	Next vCloud Availability Version	Upgrade Method
vCloud Availability 3.0.x	vCloud Availability 3.5.x	Use the service management interface, see <a href="#">Upgrading vCloud Availability by Using the Service Management Interface</a> .
vCloud Availability 3.0	vCloud Availability 3.5.x	Use the appliance command-line interface, see <a href="#">Command-Line Upgrading</a> .

**Note** When upgrading vCloud Availability, verify that the environment is prepared as per [Configure vCloud Availability Pre-Upgrade](#). To complete the upgrade sequence, see [Configure vCloud Availability Post-Upgrade](#).

## Selecting an Upgrade Repository

To upgrade vCloud Availability, you can configure each vCloud Availability appliance to download the upgrade files from the following source repositories.

**Table 5-2.**

Repository	Description
Default VMware repository	Use the default repository for environments that allows an external Internet access to the VMware repository.
An ISO image	Use an upgrade ISO file mounted in the virtual appliance CD-ROM drive for environments without an external Internet access.
A specified repository	Use a specified local repository as a content mirror where you can upload the upgrade files. Use the local repository for environments without an external Internet access. Also, use the local repository when the vCloud Availability appliances are deployed in different datastores.

This chapter includes the following topics:

- [vCloud Availability Upgrade Sequence](#)
- [Configure vCloud Availability Pre-Upgrade](#)
- [Upgrading vCloud Availability by Using the Service Management Interface](#)
- [Command-Line Upgrading](#)
- [Configure vCloud Availability Post-Upgrade](#)

## vCloud Availability Upgrade Sequence

To upgrade successfully vCloud Availability, in all sites you upgrade each vCloud Availability appliance according to a specific order.

Upgrade the vCloud Availability sites in the following order:

- 1 Upgrade all vCloud Availability appliances in the local cloud site.
- 2 Upgrade all vCloud Availability appliances in remote cloud sites.
- 3 Upgrade all vCloud Availability On-Premises Appliance nodes.

In a vCloud Availability cloud site, upgrade all the appliances according to the following procedure.

### Prerequisites

- Verify that before starting the upgrade, current snapshots of all the appliances exist in the site.
- Verify that the sites are prepared for replication interruptions and Recovery Point Objective (RPO) violations.

### Procedure

- 1 Upgrade the vCloud Availability Cloud Replication Management Appliance.
- 2 Upgrade all vCloud Availability Cloud Replicator Appliance nodes.
- 3 Upgrade the vCloud Availability Cloud Tunnel Appliance.

### Results

The vCloud Availability cloud site is upgraded.

## What to do next

After upgrading the local cloud site, the remote cloud sites, and upgrading the vCloud Availability On-Premises Appliance nodes, you can start using the new vCloud Availability version.

# Configure vCloud Availability Pre-Upgrade

Before upgrading to vCloud Availability 3.5, if using **Discover the vCloud Director Service address automatically**, you must manually enter the vCloud Director details.

## Prerequisites

If vCloud Availability is configured with **Enter details for the vCloud Director Service manually**, you can skip this procedure.

## Procedure

- 1 Log in to the management interface of the vCloud Availability Cloud Replication Management Appliance.
  - a In a Web browser, go to `https://Appliance-IP-Address/ui/admin`.
  - b Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
  - c Click **Login**.
- 2 In the left pane, click **Configuration**.
- 3 Under **Service endpoints**, next to **vCloud Director address** click **Edit**.
- 4 In the **vCloud Director Details** window, enter the vCloud Director details.
  - a Select **Enter details for the vCloud Director Service manually**.
  - b Enter the vCloud Director URL as `https://vCloud Director-IP-address:443/api`.
  - c Enter the vCloud Director **System administrator** credentials and click **Apply**.  
Use `administrator@system`, where *system* is the vCloud Director organization name.
  - d Verify the thumbprint and accept the vCloud Director SSL certificate.

## Results

vCloud Availability is configured with the vCloud Director details.

## What to do next

You can proceed with the upgrade of vCloud Availability.

## Upgrading vCloud Availability by Using the Service Management Interface

To upgrade the vCloud Availability components from version 3.x, you can use the management interface of each of the cloud appliances, select an upgrade repository, and follow the management interface upgrade procedures for the selected repository.

- If upgrading from vCloud Availability 3.x, you can follow the procedures in the current chapter and use the management interface for the upgrade. Alternatively, you can use the appliance command-line interface for the upgrade by following the [Command-Line Upgrading](#) procedures.
- If upgrading from vCloud Availability 3.0, you must follow the [Command-Line Upgrading](#) procedures.

## Upgrade vCloud Availability by Using the Default Repository

You can configure vCloud Availability components to use the default VMware repository for the upgrade.

### Prerequisites

- Verify that you follow a strict order when upgrading the vCloud Availability components. For more information, see [vCloud Availability Upgrade Sequence](#).
- Verify that each vCloud Availability appliance has an external Internet access to the VMware repository.

### Procedure

- 1 Log in to the service management interface of each vCloud Availability component.
  - a Open a Web browser and according to the upgrade order go to each management interface address.

Upgrade Order	vCloud Availability Appliance	Management Interface Address
First	vCloud Availability Cloud Replication Management Appliance	<a href="https://Appliance-IP-Address/ui/admin">https://Appliance-IP-Address/ui/admin</a>
Repeat for all instances	vCloud Availability Cloud Replicator Appliance	<a href="https://Replicator-IP-Address/ui/admin">https://Replicator-IP-Address/ui/admin</a>
Last	vCloud Availability Cloud Tunnel Appliance	<a href="https://Tunnel-IP-Address/ui/admin">https://Tunnel-IP-Address/ui/admin</a>

- b Log in by using the **root** user credentials.
- 2 In the left pane, click **Configuration**.
  - 3 Under **Version**, next to **Product version** click **Check for update**.
  - 4 Click **Update** and wait for the installation process to complete.

The appliance automatically restarts.

## What to do next

After upgrading all vCloud Availability appliances in all cloud sites, complete the upgrade with a post-upgrade configuration. For more information, see [Configure vCloud Availability Post-Upgrade](#).

## Upgrade vCloud Availability by Using an ISO Image

You can configure vCloud Availability components to download the upgrade package from an ISO image file that is mounted to the CD-ROM drive of the virtual appliance.

### Prerequisites

Follow a strict order when upgrading the vCloud Availability components. For more information, see [vCloud Availability Upgrade Sequence](#).

### Procedure

- 1 Download the vCloud Availability 3.x Upgrade Disk Image `VMware-vCloud-Availability-release_number-xxx-build_number.iso` file from the My VMware download site.
- 2 Copy the ISO image file to a datastore that is accessible from the vCenter Server instance that you use with vCloud Availability.
- 3 Mount the ISO file to the vCloud Availability appliances.
  - a Log in to the vSphere Client on the site where you want to upgrade vCloud Availability.
  - b On the **Home** page, click **Hosts and Clusters**.
  - c Right-click the virtual machine that hosts the vCloud Availability component and select **Edit Settings**.
  - d On the **Virtual Hardware** tab, select **CD/DVD Drive > Datastore ISO File**.
  - e Follow the prompts to add the CD/DVD drive to the vCloud Availability virtual machine and select the **Connected** option.
- 4 Log in to the service management interface of each vCloud Availability component.
  - a Open a Web browser and according to the upgrade order go to each management interface address.

Upgrade Order	vCloud Availability Appliance	Management Interface Address
First	vCloud Availability Cloud Replication Management Appliance	<a href="https://Appliance-IP-Address/ui/admin">https://Appliance-IP-Address/ui/admin</a>
Repeat for all instances	vCloud Availability Cloud Replicator Appliance	<a href="https://Replicator-IP-Address/ui/admin">https://Replicator-IP-Address/ui/admin</a>
Last	vCloud Availability Cloud Tunnel Appliance	<a href="https://Tunnel-IP-Address/ui/admin">https://Tunnel-IP-Address/ui/admin</a>

- b Log in by using the **root** user credentials.

- 5 In the left pane, click **Configuration**.

- 6 Under **Version**, next to **Update repository** click **Edit**.
- 7 In the **Update Repository** window, select **Use CDROM Updates** and click **Apply**.
- 8 Under **Version**, next to **Product version** click **Check for update**.
- 9 Click **Update** and wait for the installation process to complete.

#### What to do next

After upgrading all vCloud Availability appliances in all cloud sites, complete the upgrade with a post-upgrade configuration. For more information, see [Configure vCloud Availability Post-Upgrade](#).

## Upgrade vCloud Availability by Using a Specified Repository

You can configure vCloud Availability components to use a local repository for an upgrade.

#### Prerequisites

- Verify that you follow a strict order when upgrading the vCloud Availability components. For more information, see [vCloud Availability Upgrade Sequence](#).
- Verify that each vCloud Availability appliance has an external Internet access to the specified repository.

#### Procedure

- 1 Prepare the local repository for upgrades.
  - a Install and configure a local Web server.
  - b Download the vCloud Availability 3.x Upgrade Disk Image VMware–vCloud–Availability–*release\_number-xxx-build\_number*.iso file from the My VMware download site.
  - c Mount the ISO image and copy the update directory to the local Web server.  
The update directory should contain `manifest` and `package-pool` directories.
- 2 Log in to the service management interface of each vCloud Availability component.
  - a Open a Web browser and according to the upgrade order go to each management interface address.

Upgrade Order	vCloud Availability Appliance	Management Interface Address
First	vCloud Availability Cloud Replication Management Appliance	<a href="https://Appliance-IP-Address/ui/admin">https://Appliance-IP-Address/ui/admin</a>
Repeat for all instances	vCloud Availability Cloud Replicator Appliance	<a href="https://Replicator-IP-Address/ui/admin">https://Replicator-IP-Address/ui/admin</a>
Last	vCloud Availability Cloud Tunnel Appliance	<a href="https://Tunnel-IP-Address/ui/admin">https://Tunnel-IP-Address/ui/admin</a>

- b Log in by using the **root** user credentials.
- 3 In the left pane, click **Configuration**.

- 4 Under **Version**, next to **Update repository** click **Edit**.
- 5 In the **Update Repository** window, select **Use Specified Repository** and provide the repository details.
  - a Enter the URL address of the local repository and point to the update directory of the local Web server.  
For example, use `http://local-Web-server-address/update`.
  - b To authenticate to the repository, enter the user name and password and click **Apply**.
- 6 Under **Version**, next to **Product version** click **Check for update**.
- 7 Click **Update** and wait for the installation process to complete.  
The appliance automatically restarts.

#### What to do next

After upgrading all vCloud Availability appliances in all cloud sites, complete the upgrade with a post-upgrade configuration. For more information, see [Configure vCloud Availability Post-Upgrade](#).

## Command-Line Upgrading

To upgrade from version 3.0, you must use the command-line interface of each of the appliances. You can also upgrade from version 3.x by using the command-line interface.

### Command-Line Upgrade of vCloud Availability by Using the Default VMware Repository

You can upgrade vCloud Availability by using the default VMware repository.

You must perform this procedure multiple times, to upgrade each vCloud Availability appliance.

#### Prerequisites

- Verify that you follow a strict order when upgrading the vCloud Availability components. For more information, see [vCloud Availability Upgrade Sequence](#).
- Verify that each vCloud Availability appliance has an external Internet access to the VMware repository.

#### Procedure

- 1 Connect to the vCloud Availability appliance by using a Secure Shell (SSH) client.
  - a Open an SSH connection to *Appliance-IP-Address*.
  - b Authenticate as the **root** user.
- 2 Check for upgrades.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --check
```

### 3 Install the upgrade.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --install latest --accepteula
```

### 4 Reboot the vCloud Availability appliance.

```
reboot
```

#### What to do next

After you upgrade all vCloud Availability appliances in all cloud sites, complete the upgrade with a post-upgrade configuration. For more information, see [Configure vCloud Availability Post-Upgrade](#).

## Command-Line Upgrade of vCloud Availability by Using an ISO Image

You can upgrade vCloud Availability by using an ISO image file that contains the upgrade binaries.

#### Prerequisites

Follow a strict order when upgrading the vCloud Availability components. For more information, see [vCloud Availability Upgrade Sequence](#).

#### Procedure

- 1 Download the vCloud Availability 3.0.x Upgrade Disk Image `VMware-vCloud-Availability-release_number-xxx-build_number.iso` file from the My VMware download site.
- 2 Copy the ISO image file to a datastore that is accessible from the vCenter Server instance that you use with vCloud Availability.
- 3 Mount the ISO image to a vCloud Availability appliance.
  - a Log in to the vSphere Client in the site where you want to upgrade vCloud Availability.
  - b On the **Home** page, click **Hosts and Clusters**.
  - c Right-click the virtual machine that hosts the vCloud Availability component and select **Edit Settings**.
  - d On the **Virtual Hardware** tab, select **CD/DVD Drive > Datastore ISO File**.
  - e Follow the prompts and add the CD/DVD drive to the vCloud Availability virtual machine and select the **Connected** option.

Repeat this step to mount the ISO file to all remaining vCloud Availability appliances.
- 4 Upgrade a vCloud Availability appliance.
  - a Connect to the appliance by using a Secure Shell (SSH) client and log in as the **root** user.
  - b Set the virtual CD/DVD drive of the appliance as a repository that contains the upgrade files.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --repo cdrom://
```

- c Check for upgrades.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --check
```

- d Install the upgrade.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --install latest --accepteula
```

- e Reboot the vCloud Availability appliance.

```
reboot
```

Repeat this step to upgrade all remaining vCloud Availability appliances.

### What to do next

After you upgrade all vCloud Availability appliances in all cloud sites, complete the upgrade with a post-upgrade configuration. For more information, see [Configure vCloud Availability Post-Upgrade](#).

## Command-Line Upgrade of vCloud Availability by Using a Specified Repository

You can upgrade vCloud Availability by using a specified repository that contains the upgrade binaries.

### Prerequisites

- Follow a strict order when upgrading the vCloud Availability components. For more information, see [vCloud Availability Upgrade Sequence](#).
- Verify that each vCloud Availability appliance has a network access to the specified repository.

### Procedure

- 1 Prepare the specified repository for upgrades.
  - a Install and configure a local Web server.
  - b Download the vCloud Availability 3.0.x Upgrade Disk Image `VMware-vCloud-Availability-release_number-build_number.iso` file from the My VMware download site.
  - c Mount the ISO image file to a local computer.
  - d From the mounted ISO, copy the `update` directory containing the `manifest` and the `package-pool` sub-directories to the local Web server.
- 2 Upgrade a vCloud Availability appliance.
  - a Connect to the appliance by using a Secure Shell (SSH) client and log in as the **root** user.
  - b Use the specified repository as an upgrade source.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --repo specified-repository-URL
```

- c Check for upgrades.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --check
```

- d Install the upgrade.

```
/usr/bin/sudo /opt/vmware/bin/vamicli update --install latest --accepteula
```

- e Reboot the vCloud Availability appliance.

```
reboot
```

Repeat this step to upgrade all remaining vCloud Availability appliances.

### What to do next

After you upgrade all vCloud Availability appliances in all cloud sites, complete the upgrade with a post-upgrade configuration. For more information, see [Configure vCloud Availability Post-Upgrade](#).

## Configure vCloud Availability Post-Upgrade

After upgrading all vCloud Availability components in both the local and in the remote sites, you perform post-upgrade steps. Enter the vCloud Director details and, optionally, re-enable the tunneling service, and re-establish the trust between the cloud sites.

### Prerequisites

- For more information on how to re-enable the vCloud Availability Tunnel instance, see [Enable a vCloud Availability Tunnel Instance](#).
- For more information on how to re-establish the cloud to cloud trust, see *Administering vCloud Availability*.

### Procedure

- 1 Log in to the management interface of the vCloud Availability Cloud Replication Management Appliance.
  - a In a Web browser, go to `https://Appliance-IP-Address/ui/admin`.
  - b Select **Appliance login** or **SSO login** and enter the **root** or the *single sign-on* user credentials.
  - c Click **Login**.

- 2 Reinstall the latest version of the vCloud Availability plug-in for vCloud Director.

Skipping the plug-in installation in vCloud Director shows an error message The requested API version is not supported by the server.

- a In the left pane, click **Configuration**.
- b Under **Service endpoints**, next to **vCloud Director address** click **Edit**.

- c Enter the vCloud Director URL as `https://vCloud Director-IP-address:443/api`.
  - d Enter the vCloud Director **System administrator** credentials and click **Apply**.  
Use `administrator@system`, where *system* is the vCloud Director organization name.
  - e Verify the thumbprint and accept the vCloud Director SSL certificate.
- 3 If you are upgrading from vCloud Availability 3.0, re-enable the vCloud Availability Tunnel instance.
  - 4 If you are upgrading from vCloud Availability 3.0, re-establish the cloud to cloud trust.

### Results

The upgrade in the cloud site is complete and vCloud Availability is ready for replications. For more information, see *Using vCloud Availability*.