

Installing, Configuring, and Upgrading vCloud Availability in the Cloud

11 APR 2019

VMware vCloud Availability 3.0



vmware®

You can find the most up-to-date technical documentation on the VMware website at:

<https://docs.vmware.com/>

If you have comments about this documentation, submit your feedback to

docfeedback@vmware.com

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

Copyright © 2019 VMware, Inc. All rights reserved. [Copyright and trademark information.](#)

Contents

1	About Installing, Configuring and Upgrading VMware vCloud Availability in the Cloud	5
2	Overview of VMware vCloud Availability	6
	Cloud Deployment Architecture	7
	VMware vCloud Availability Services	9
3	Installing and Configuring VMware vCloud Availability	12
	VMware vCloud Availability Requirements	12
	VMware vCloud Availability Users and Services Requirements	12
	VMware vCloud Availability Deployment Requirements	14
	VMware vCloud Availability Network Ports Configuration	15
	vCloud Availability Management Endpoints	18
	Deploy VMware vCloud Availability Services by Using the vSphere Client	19
	Deploying VMware vCloud Availability Services with the VMware OVF Tool	20
	Defining OVF Tool Parameters for VMware vCloud Availability Services Deployment	21
	Deploy VMware vCloud Availability Services by Using the OVF Tool	21
	Installation Checklist	23
	Use the Installation Checklist	23
	Resume an Incomplete Installation	24
	Configuring vCloud Availability	25
	Configure a vCloud Availability Replication Manager Instance	26
	Configure a vCloud Availability vApp Replication Manager Instance	27
	Configure a vCloud Availability Replicator Instance	28
	Register a vCloud Availability Replicator Instance with a vCloud Availability Replication Manager Instance in the Same Site	29
	Configure a vCloud Availability Tunnel Instance	30
	Enable a vCloud Availability Tunnel Instance	31
	Restart the vCloud Availability Services	32
	Add an Additional vCloud Availability Replicator Instance	34
	Customer Experience Improvement Program	35
	Categories of Information That VMware Receives	35
	Join or Leave the Customer Experience Improvement Program	35
4	Upgrading VMware vCloud Availability	37
	Order of Upgrading the VMware vCloud Availability Components	38
	Command-Line Upgrading	38
	Command-Line Upgrade of vCloud Availability by Using the Default VMware Repository	39

Command-Line Upgrade of vCloud Availability by Using an ISO Image	39
Command-Line Upgrade of vCloud Availability by Using a Specified Repository	40
Upgrading vCloud Availability by Using the Service Management Interface	41
Upgrade vCloud Availability Components by Using the Default Repository	42
Upgrade vCloud Availability Components by Using an ISO Image	42
Upgrade vCloud Availability Components by Using a Specified Repository	44
Install the vCloud Availability Plug-In for vCloud Director	45
Configure vCloud Availability Post-Upgrade	46

About Installing, Configuring and Upgrading VMware vCloud Availability in the Cloud

1

The *Installing, Configuring and Upgrading VMware vCloud Availability in the Cloud* document provides information on how to install, configure, upgrade, and administer the VMware vCloud[®] Availability solution from the service provider side.

Intended Audience

This information is intended for VMware Cloud Provider Program service providers who are familiar with virtual machine technology and data center operations including but not limited to the following areas:

- VMware vSphere[®]
- VMware vCloud Director[®]
- VMware vCloud[®] Availability
- Secure Shell (SSH)
- Bash Scripting

VMware Technical Publications Glossary

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

Overview of VMware vCloud Availability

2

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

The service operates through a VMware Cloud Provider Program, and depending on the installation type, it provides recovery for cloud and on-premises environments. The VMware vCloud Availability provides:

- Replication management and monitoring of replications from and to a cloud site.
- Failback recovered in the cloud workloads to the on-premises site.
- Migration of protected VMs in the cloud site back to the on-premises appliance.
- Self-service protection and failover workflows per virtual machine (VM).
- Single installation package as a Photon-based virtual appliance.
- The capability of each deployment to serve as both source and recovery vCloud Director instance (site). There are no dedicated source and destination sites.
- Symmetrical replication flow that can be started from either the source or the recovery vCloud Director site.
- Replication and recovery of vApps and VMs between vCloud Director sites.
- Using a single-site vCloud Availability installation, you can migrate vApps and VMs between Virtual Data Centers that belong to a single vCloud Director Organization.
- Built-in Secure Tunneling requires no incoming open ports on the on-premises site.
- Integration with existing vSphere environments.
- Multi-tenant support.
- Built-in encryption or encryption and compression of replication traffic.
- Support for multiple vCenter Server and ESXi versions.

This chapter includes the following topics:

- [Cloud Deployment Architecture](#)
- [VMware vCloud Availability Services](#)

Cloud Deployment Architecture

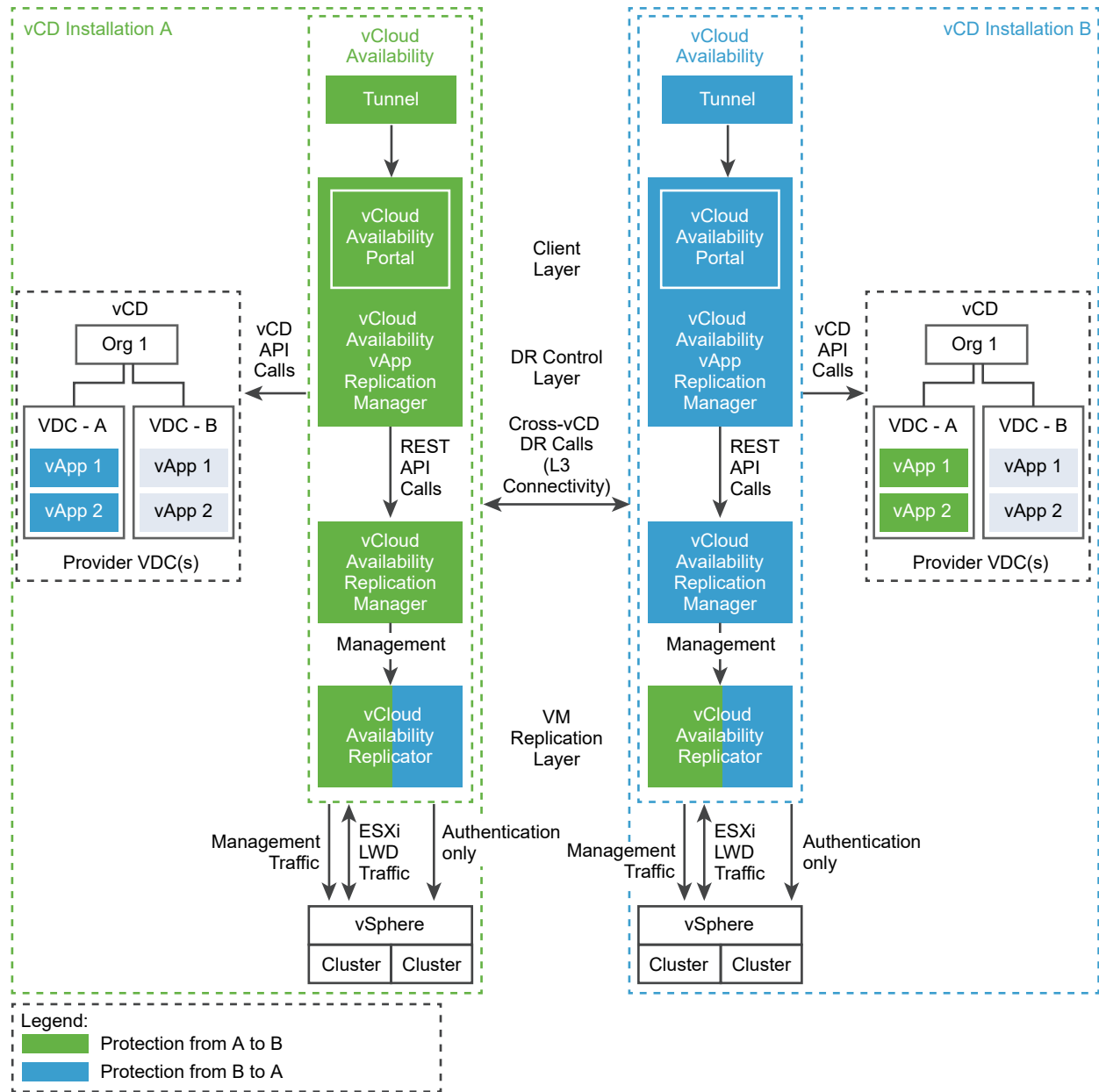
The cloud deployment architecture of the VMware vCloud Availability solution relies on symmetrical replication operations between cloud environments.

In a single cloud environment, the vCloud Availability Replicator, the vCloud Availability Replication Manager, the vCloud Availability vApp Replication Manager, and the vCloud Availability Tunnel operate together to support the replication, secure communication, and storage of the replicated data. Each service provider can support recovery for multiple customer environments that can scale to handle increasing loads for each tenant, and for multiple tenants.

Test and Development Deployment

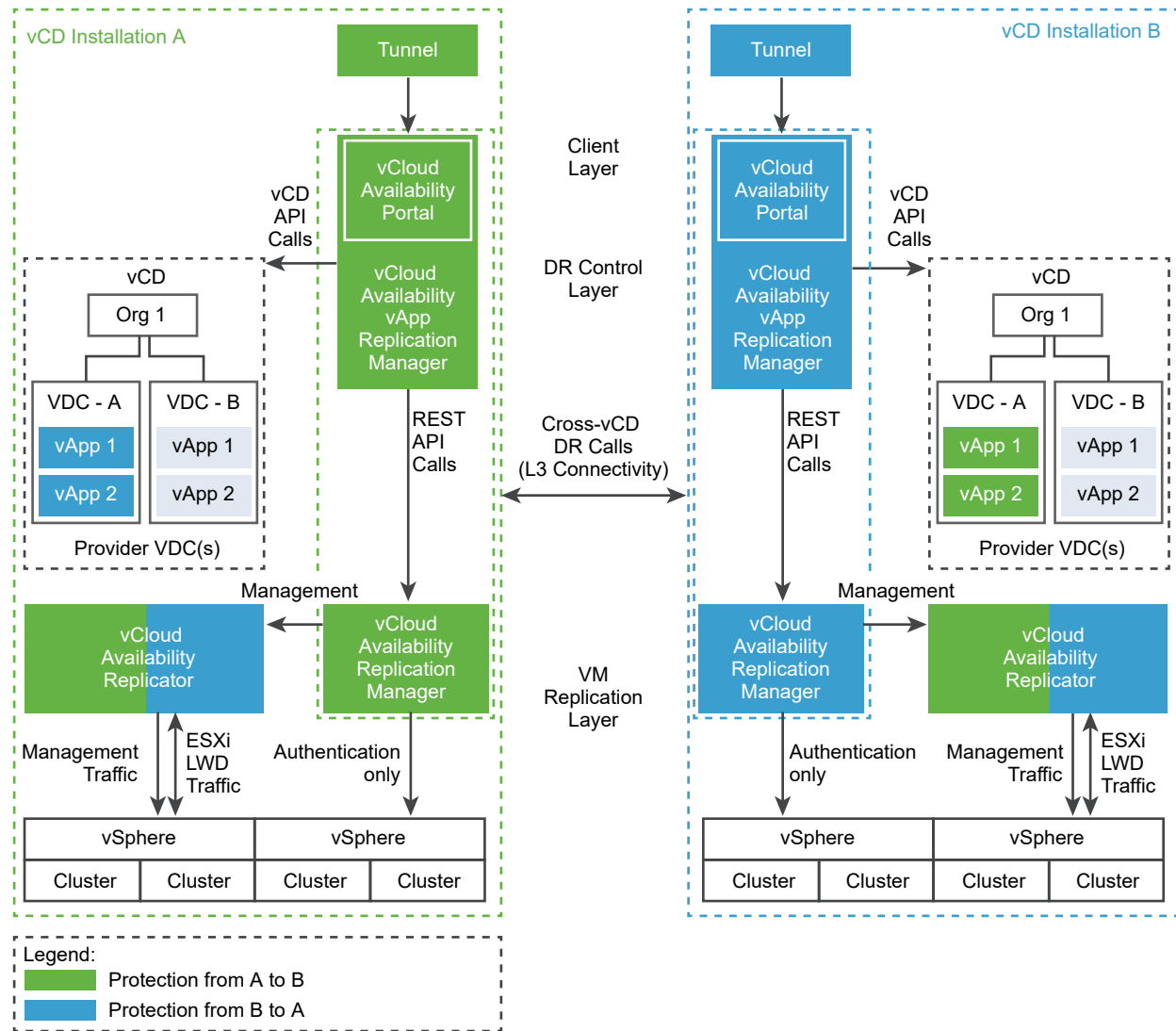
For test and development purposes, you can employ the simplest architecture where all four VMware vCloud Availability services are deployed and configured on a single appliance.

The components with no color in the following diagrams represent existing components in the vCloud Director environments. The remaining colored cells represent VMware vCloud Availability services that you deploy during VMware vCloud Availability installation and configuration procedures.



Production Deployment

For production deployments, you deploy and configure a vCloud Availability Tunnel appliance and an appliance that hosts the vCloud Availability vApp Replication Manager, and vCloud Availability Replication Manager services. You deploy and configure dedicated vCloud Availability Replicator appliance or appliances.



VMware vCloud Availability Services

VMware vCloud Availability solution is composed of services that can coexist in the same virtual appliance or in dedicated appliances.

Table 2-1. vCloud Availability Services Definitions

Name	Description
vCloud Availability Replicator	Exposes the low-level HBR primitives as REST APIs.
vCloud Availability Replication Manager	A management service operating on the vCenter Server level. It understands the vCenter Server level concepts for starting the replication workflow for the virtual machines.

Table 2-1. vCloud Availability Services Definitions (continued)

Name	Description
vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal	Provides the main interface for the cloud and on-prem replication operations. It understands the vCloud Director level concepts and works with vApps and virtual machines. The embedded vCloud Availability Portal provides tenants (vCloud Availability Portal) and service providers (vCloud Availability Service Provider Portal) with a graphic user interface to facilitate the management of the VMware vCloud Availability solution. It also provides overall system and workload information.
vSphere Replication Server and vSphere Replication Filter	The replication server receives and records delta information for each replicated virtual machine. During the cloud-to-cloud replication, delta information is sent from one ESXi host to another ESXi host.
vCloud Availability Tunnel	Simplifies provider networking setup by channeling all incoming and outgoing traffic for a site through a single point - the vCloud Availability Tunnel appliance. The traffic is both management and monitoring for the replication data (LWD traffic).
Lightweight Delta Protocol Service(LWD Proxy)	The proprietary replication protocol service ensures that each incoming replication data stream comes only from the authorized source LWD Proxy instance, and each outgoing replication data stream goes only to an authorized destination LWD Proxy instance.

Table 2-2. Additional Services Definitions

Name	Description
vCloud Director	With the vCloud Director solution service providers can build secure, multi-tenant private clouds by pooling infrastructure resources into virtual data centers and exposing them to users through Web-based portals and programmatic interfaces as fully automated, catalog-based services.
VMware Platform Services Controller [®]	The Platform Services Controller provides common infrastructure services to the vSphere environment. Services include licensing, certificate management, and authentication with VMware vCenter [®] Single Sign-On.

The VMware vCloud Availability services provide a management interface for configuration and administration purposes.

You perform initial configuration of VMware vCloud Availability services by using the vCloud Availability Replication Manager, vCloud Availability Replicator, and vCloud Availability vApp Replication Manager management interfaces.

You cannot access the vCloud Availability Portal before finishing the initial VMware vCloud Availability configuration.

You can find the configuration and log files for the VMware vCloud Availability services at the following locations.

Table 2-3. Configuration Files Location

Service	Default Location
vCloud Availability Replication Manager	/opt/vmware/h4/manager/config/ application.properties
vCloud Availability Replicator	/opt/vmware/h4/replicator/config/ application.properties

Table 2-3. Configuration Files Location (continued)

Service	Default Location
vCloud Availability vApp Replication Manager	/opt/vmware/h4/cloud/config/application.properties
vCloud Availability Tunnel	/opt/vmware/h4/tunnel/config/application.properties

Table 2-4. Log Files Location

Service	Default Location
vCloud Availability Replication Manager	/opt/vmware/h4/manager/log/manager.log
vCloud Availability Replicator	/opt/vmware/h4/replicator/log/replicator.log
vCloud Availability vApp Replication Manager	/opt/vmware/h4/cloud/log/cloud.log
vCloud Availability Tunnel	/opt/vmware/h4/tunnel/log/tunnel.log

Installing and Configuring VMware vCloud Availability

3

You first deploy the VMware vCloud Availability services and then perform initial configuration of each service so that all of the solution components are visible and able to connect.

This chapter includes the following topics:

- [VMware vCloud Availability Requirements](#)
- [Deploy VMware vCloud Availability Services by Using the vSphere Client](#)
- [Deploying VMware vCloud Availability Services with the VMware OVF Tool](#)
- [Installation Checklist](#)
- [Configuring vCloud Availability](#)
- [Customer Experience Improvement Program](#)

VMware vCloud Availability Requirements

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

VMware vCloud Availability Users and Services Requirements

Before you start deploying and configuring vCloud Availability, verify that the users and the services 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 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 vCloud Director user and 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 vCloud Director **system administrator** by using 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 vCloud Director organization administrator by using 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 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 3-1. 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

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 appliances 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.

For more information about the network requirements, see [VMware vCloud Availability Network Ports Configuration](#).

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 appliances within the respective site must be configured with that same single sign-on domain.

For information about the interoperability between vCloud Availability and vCenter Server, see [VMware Product Interoperability Matrices](#).

VMware vCloud Availability Deployment Requirements

Before you start deploying and configuring VMware vCloud Availability services, verify that your environment complies with the following requirements.

Deployment Types and Hardware Requirements

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

Depending on your 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 3-2. VMware vCloud Availability Cloud Deployment Types

Appliance Deployment Type	Description	Hardware Requirements
Combined Appliance	<p>An all-in-one appliance deployment type, 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"> ■ vCloud Availability Replication Manager ■ vCloud Availability Replicator ■ vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal ■ vCloud Availability Tunnel 	<ul style="list-style-type: none"> ■ 4 vCPUs ■ 6 GB RAM ■ 10 GB Storage
Cloud Replication Management	<p>A dedicated appliance deployment type, where a single cloud replication management appliance contains the following services.</p> <ul style="list-style-type: none"> ■ vCloud Availability Replication Manager ■ vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal <p>You deploy the cloud replication management appliance to configure replications from and to vCloud Director.</p>	<ul style="list-style-type: none"> ■ 2 vCPUs ■ 4 GB RAM ■ 10 GB Storage

Table 3-2. VMware vCloud Availability Cloud Deployment Types (continued)

Appliance Deployment Type	Description	Hardware Requirements
Cloud Replicator	A dedicated vCloud Availability Replicator appliance handles the replication traffic for a site. In large-scale environments, you can deploy more than one vCloud Availability Replicator per site.	<ul style="list-style-type: none"> ■ 4 vCPUs ■ 6 GB RAM ■ 10 GB Storage
Cloud Tunnel	A dedicated vCloud Availability Tunnel appliance.	<ul style="list-style-type: none"> ■ 2 vCPUs ■ 2 GB RAM ■ 10 GB Storage

You use a single installation OVA file to deploy vCloud Availability on-premises. When installing vCloud Availability on-premises, you are not presented with a choice of a deployment type. Only a vCloud Availability replicator appliance deploys on-premises.

Other Deployment Requirements

- An ESXi host can handle the replication traffic through its management VMkernel interface. You can separate the management traffic from the replication traffic by creating a dedicated replication VMkernel interface. Use the following tags when you create a VMkernel interface for the replication traffic.
 - `vSphere Replication` - Use this tag to configure the ESXi host for the outgoing replication traffic.
 - `vSphere Replication NFC` - Use this tag to configure the ESXi host for the incoming replication traffic.

You configure the replication VMkernel interface in its own IP subnet and connect vCloud Availability Replicator to the same virtual port group. With this configuration, the replication traffic between the ESXi hosts and the vCloud Availability Replicator instances stays in the same broadcast domain. As a result, the replication traffic does not cross a router uncompressed and saves the bandwidth.

For how to configure a dedicated replication VMkernel interface, see [Set Up a VMkernel Adapter for vSphere Replication Traffic on a Source Host](#).

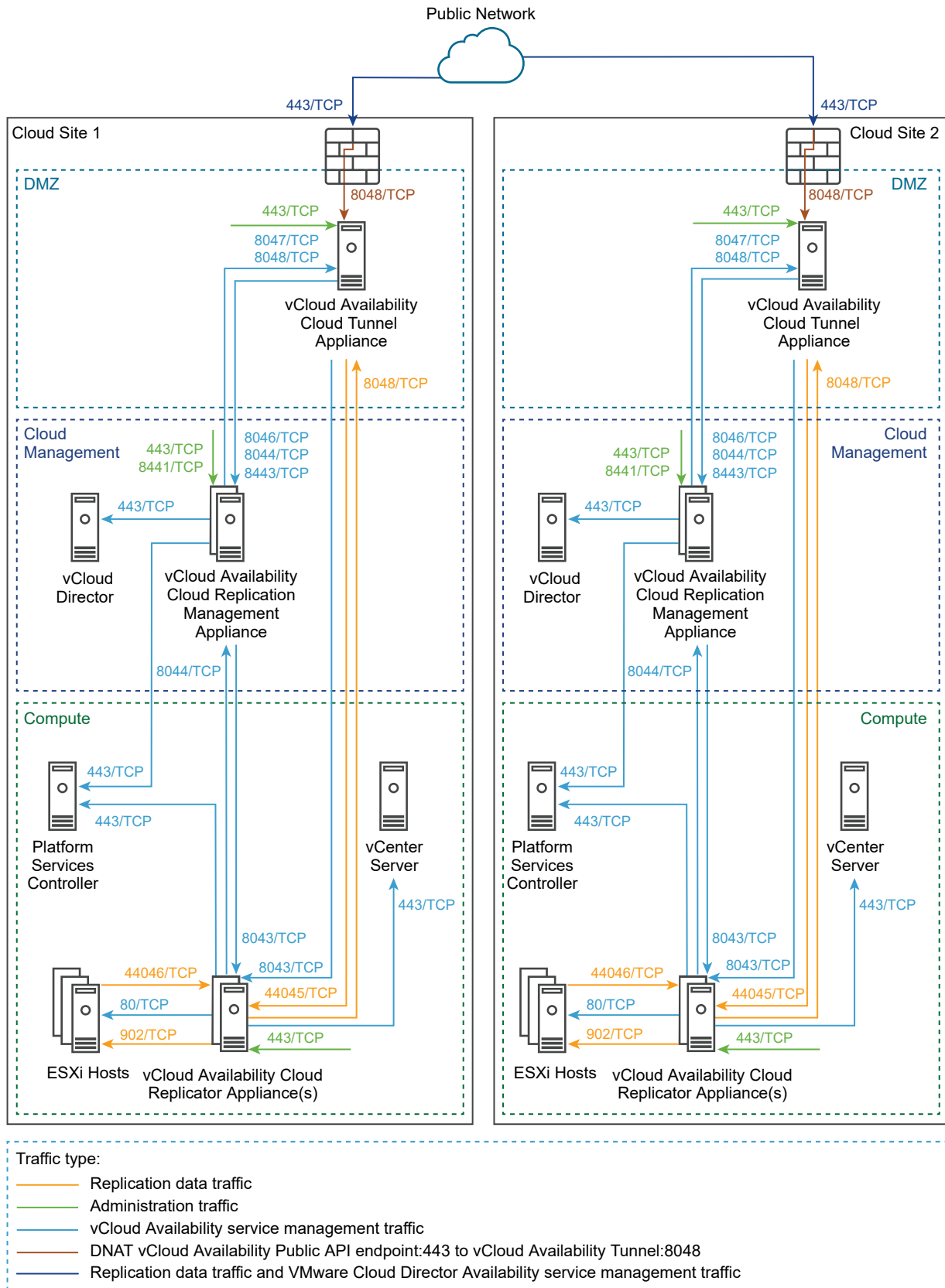
- You deploy a single vCloud Availability vApp Replication Manager instance per vCloud Director server group (installation). The vCloud Director server group consists of, for example, a vCloud Director cell and a resource vCenter Server with at least one ESXi host.
- The VMware vCloud Availability services perform a host name certificate verification. In the vCloud Director certificate, the `CommonName` or at least one of the entries in the `Subject Alternative Name` must match the vCloud Director FQDN or IP that you use when registering vCloud Director.

VMware vCloud Availability Network Ports Configuration

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 diagram shows the direction of the data flow, the data traffic type, and the required network ports for the communication between the vCloud Availability services and the disaster recovery infrastructure for a typical deployment in 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 the 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.

The following table lists the required network ports to be opened for the external communication with the vCloud Availability services.

Table 3-3. 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.

vCloud Availability Management Endpoints

According to the deployment method, use the following management ports when accessing each of the vCloud Availability services.

Combined Appliance

The following table lists the management interface addresses with ports that the vCloud Availability services use when deployed and configured on a single combined appliance.

Table 3-4. Services Management Endpoints on a Combined Appliance

Component	Management Endpoint
vCloud Availability vApp Replication Manager	https://Appliance-IP-Address/ui/admin
vCloud Availability Replication Manager	https://Appliance-IP-Address:8441/ui/admin

Table 3-4. Services Management Endpoints on a Combined Appliance (continued)

Component	Management Endpoint
vCloud Availability Replicator	<code>https://Appliance-IP-Address:8440/ui/admin</code>
vCloud Availability Tunnel	<code>https://Appliance-IP-Address:8442/ui/admin</code>

Dedicated Appliance

The following table lists the management interface addresses with ports that the vCloud Availability services use when each is deployed and configured on a dedicated appliance.

Table 3-5. Services Management Endpoints on Dedicated Appliances

Appliance	Component	Management Endpoint
Cloud Replication Management	vCloud Availability vApp Replication Manager	<code>https://Replication-Management-Appliance-IP-Address/ui/admin</code>
	vCloud Availability Replication Manager	<code>https://Replication-Management-Appliance-IP-Address:8441/ui/admin</code>
Cloud Replicator	vCloud Availability Replicator	<code>https://Replicator-Appliance-IP-Address/ui/admin</code>
Cloud Tunnel	vCloud Availability Tunnel	<code>https://Tunnel-Appliance-IP-Address/ui/admin</code>

Deploy VMware vCloud Availability Services by Using the vSphere Client

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

Prerequisites

- Download the vCloud Availability 3.0.x Appliance for Cloud Providers (Cloud Sites) `vCloud-Availability-release_number-xxx-build_number_OVF10.ova` file, containing the binaries for the VMware vCloud Availability appliance.
- If your vSphere version is earlier than 6.5, install the Client Integration Plug-in to be able to use the **Deploy OVF Template** option in the vSphere Web Client.

Procedure

- 1 Log in to your vCenter Server by using the vSphere Client.
- 2 Navigate to a target object where you want to deploy the VMware 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 (Required) Select the **Enable SSH** check box.
If you do not enable SSH, you can configure the appliance later. For more information, see <https://kb.vmware.com/s/article/59197>.
 - 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 VMware 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/VMware-vCloud-Availability-release_number-xxx-build_number_OVF10.ova</i> ".
VMNAME	Virtual machine name.
VSPHERE_DATASTORE	The VSPHERE_DATASTORE value is the datastore name as it is displayed in the vSphere Web Client.
VSPHERE_NETWORK	The name of the network on which the appliance to run.
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"> ■ <i>/data-center-name/host/cluster-1-name/ESXi-host-fully-qualified-domain-name</i> ■ <i>/data-center-name/host/cluster-2-name/ESXi-host-IP-address</i> <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"> ■ <i>/data-center-name/host/ESXi-host-fully-qualified-domain-name</i> ■ <i>/data-center-name/host/ESXi-host-IP-address</i> <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.

Table 3-6. VMware vCloud Availability Appliance Deployment Type According to the OVF Tool Deployment Option Argument

Appliance Deployment Type	OVF Tool Deployment Option Argument	Description
Combined Appliance	combined	An all-in-one deployment type for testing, evaluation, and small-scale environments. A single combined appliance contains the following services, ready for configuration: <ul style="list-style-type: none"> ■ vCloud Availability Replication Manager ■ vCloud Availability Replicator ■ vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal ■ vCloud Availability Tunnel
Cloud Replication Manager	combined	Deploys a single appliance containing the following services: <ul style="list-style-type: none"> ■ vCloud Availability Replication Manager ■ vCloud Availability vApp Replication Manager with embedded vCloud Availability Portal
Cloud Replicator	replicator	Deploys a dedicated vCloud Availability Replicator appliance.
Cloud Tunnel	tunnel	Deploys a dedicated vCloud Availability Tunnel appliance.

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

Starting with vCloud Availability 3.0.1, you can use an interactive installation checklist that guides you through the required steps of the installation process.

Use the Installation Checklist

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

The interactive installation checklist guides you through the required steps to set up all vCloud Availability services. The installation checklist is available in a Cloud Replication Management appliance or in a Combined Appliance.

Prerequisites

Verify that you are using vCloud Availability 3.0.x.

Procedure

- 1 Log in to the vCloud Availability vApp Replication Manager service management interface.
 - a Open a Web browser and 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`**.

- 3 On 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 pending installation step. 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.

What to do next

After you enable the default replication policy to accept pairing, you can pair cloud sites.

Resume an Incomplete Installation

Closing the installation checklist at any time does not interrupt the installation progress. You can resume following the steps at a later stage by returning to the installation checklist. The installation checklist reflects the current state of the installation, verifies the completed steps, and guides you through the remaining steps to complete the installation.

Prerequisites

Verify that you are using vCloud Availability 3.0.x.

Procedure

- 1 To return to the installation checklist, you can navigate your browser to the following address, depending on the appliance deployment type.

Table 3-7. Resuming the Installation Checklist

Appliance Deployment Type	Installation Checklist URL
Combined Appliance	https://Appliance-IP-Address/ui/guide/combined
Cloud Replication Management	https://Appliance-IP-Address/ui/guide/dedicated

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, mark it as completed by clicking **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.

What to do next

After you enable pairing in the default replication policy, you can pair cloud sites.

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 Replication Manager Instance](#)

You configure vCloud Availability Replication Manager with a vCenter Server Lookup service.

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

You configure vCloud Availability vApp Replication Manager with a site name to be used as an identifier. You register the vCloud Availability vApp Replication Manager with a vCenter Server Lookup service, and with a vCloud Director instance.

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

You configure vCloud Availability Replicator with a vCenter Server Lookup service.

4 [Register a vCloud Availability Replicator Instance with a vCloud Availability Replication Manager Instance in the Same Site](#)

You register vCloud Availability Replicator with vCloud Availability Replication Manager.

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

You configure vCloud Availability Tunnel with a vCenter Server Lookup service to allow for remote sites communication with the public port of the tunnel.

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

You enable the tunneling service communication from vCloud Availability vApp Replication Manager by registering the vCloud Availability Tunnel instances in all sites, before you can pair the on-premise site with cloud sites.

7 [Restart the vCloud Availability Services](#)

If you use vCloud Availability 3.0, after configuring the solution in a site, you restart all vCloud Availability services in a combined appliance from the **System Monitoring** page. To restart the services that are in dedicated appliances, log in to each appliance.

8 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 Replication Manager Instance

You configure vCloud Availability Replication Manager with a vCenter Server Lookup service.

Procedure

- 1 In a Web browser, navigate to **`https://Appliance-IP-Address:8441/ui/admin`**.

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

- 2 If you are prompted for a **Client Certificate**, click **Cancel**.

- 3 Log in by using the **root** user password that you set during the OVA deployment.

The **vCloud Availability Appliance Password** window opens.

- 4 Change the initial **root** user password.

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

- b Enter and confirm a new password.

Create a secured password with a minimum of eight characters and containing at least one of each of the following characters:

- Lowercase: a b c
- Uppercase: A B C
- Numeric: 1 2 3
- Special: & # %

- c Click **Apply**.

The **Getting Started** tab opens.

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

The **Lookup Service Details** window opens.

- 6 Enter a valid vCenter Server Lookup service address as **`https://Lookup-Service-IP-address:443/lookupservice/sdk`** and click **Apply**.

- 7 Accept the SSL certificate of the vCenter Server Lookup service.

- 8 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 status.

What to do next

You can now perform an initial configuration of vCloud Availability vApp Replication Manager.

Configure a vCloud Availability vApp Replication Manager Instance

You configure vCloud Availability vApp Replication Manager with a site name to be used as an identifier. You register the vCloud Availability vApp Replication Manager with a vCenter Server Lookup service, and with a vCloud Director instance.

Procedure

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

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

- 2 If you are prompted for a **Client Certificate**, click **Cancel**.

- 3 Log in as the **root** user.

The **Getting Started** tab opens.

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

The **Initial Setup** wizard opens.

- 5 Enter a **Site name**, optionally enter a **Site Description**, and click **Next**.

Important The site name is used as an identifier and cannot be changed later.

- 6 Enter the Public API endpoint tunnel address on port **8048**, optionally add a description, and click **Next**.

- 7 Enter a valid vCenter Server Lookup service address as **`https://Lookup-Service-IP-address:443/lookupservice/sdk`** and click **Apply**.

- 8 Accept the SSL certificate of the vCenter Server Lookup service.

- 9 Install the vCloud Availability plug-in for vCloud Director.

- a Select the vCloud Director Service discovery type and click **Apply**.

Option	Description
Discover the vCloud Director Service address automatically	<p>By default, this option is selected. You can use automatic vCloud Director discovery in the following cases.</p> <ul style="list-style-type: none"> ■ If the vCloud Director instance is federated with a previously specified vCenter Server Lookup service. ■ If only one vCloud Director instance is registered in the vCenter Server Lookup service. ■ If in vCloud Director the single sign-on user belongs to the System administrator group.
Enter details for the vCloud Director Service manually	<p>Use a manual vCloud Director discovery in the following cases.</p> <ul style="list-style-type: none"> ■ If the vCloud Director instance is not federated with a previously specified vCenter Server Lookup service. ■ If multiple vCloud Director instances are registered in the vCenter Server Lookup service.

- b Enter the vCloud Director URL as **`https://vCloud Director-IP-address:443/api`**.

- c Enter a vCloud Director **System administrator** credentials as *administrator@system*, and click **Next**.

In the credentials, *system* is the name of the vCloud Director system organization.

- d Accept the SSL certificate of the vCloud Director instance.

10 Enter a valid VMware vCloud Availability license key and click **Next**.

11 (Optional) To **Join the VMware Customer Experience Improvement Program**, select the check box and click **Next**.

For more information on VMware Customer Experience Improvement Program, see [Customer Experience Improvement Program](#).

12 On the **Ready To Complete** page, review the vCloud Availability vApp Replication Manager configuration summary and click **Finish**.

13 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 an OK 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

Add and configure the vCloud Availability Replicator instances, then configure and enable vCloud Availability Tunnel.

Configure a vCloud Availability Replicator Instance

You configure 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
Combined Appliance	<code>https://Appliance-IP-Address:8440/ui/admin</code>
Cloud Replicator Appliance	<code>https://Replicator-Appliance-IP-Address/ui/admin</code>

2 Change the initial **root** user password.

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

Create a secured password with a minimum of eight characters and containing at least one of each of the following characters:

- Lowercase: a b c
- Uppercase: A B C
- Numeric: 1 2 3
- Special: & # %

- c Click **Apply**.

The **Getting Started** tab opens.

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

The **Lookup Service Details** window opens.

4 Enter a valid vCenter Server Lookup service address as **`https://Lookup-Service-IP-address:443/lookupservice/sdk`** and click **Apply**.

5 Accept the SSL certificate of the vCenter Server Lookup service.

6 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 status.

What to do next

You can now register vCloud Availability Replicator with vCloud Availability Replication Manager.

Register a vCloud Availability Replicator Instance with a vCloud Availability Replication Manager Instance in the Same Site

You register vCloud Availability Replicator with vCloud Availability Replication Manager.

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 Open a Web browser and 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**
The **New Replicator** window opens.
- 4 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 root 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.

The vCloud Availability Replication Manager service management interface always displays the vCloud Availability Replicator instance IP address, even when you entered the FQDN.

- 5 Accept the SSL certificate of the vCloud Availability Replicator.
On the **Replicators administration** page, the status icon turns green 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 an OK status.

Configure a vCloud Availability Tunnel Instance

You configure vCloud Availability Tunnel with a vCenter Server Lookup service to allow for remote sites communication with the public port of the tunnel.

Procedure

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

Deployment type	Service Management Interface
Combined Appliance	https://Appliance-IP-Address:8442/ui/admin
Cloud Tunnel Appliance	https://Tunnel-Appliance-IP-Address/ui/admin

- 2 Change the initial **root** user password.

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

Create a secured password with a minimum of eight characters and containing at least one of each of the following characters:

- Lowercase: a b c
 - Uppercase: A B C
 - Numeric: 1 2 3
 - Special: & # %
- c Click **Apply**.

The **Getting Started** tab opens.

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

The **Lookup Service Details** window opens.

- 4 Enter a valid vCenter Server Lookup service address as <https://Lookup-Service-IP-address:443/lookupservice/sdk> and click **Apply**.

- 5 Accept the SSL certificate of the vCenter Server Lookup service.

- 6 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 status.

What to do next

You can now enable the tunneling service communication with VMware vCloud Availability services.

Enable a vCloud Availability Tunnel Instance

You enable the tunneling service communication from vCloud Availability vApp Replication Manager by registering the vCloud Availability Tunnel instances in all sites, before you can pair the on-premise site with cloud sites.

Prerequisites

- Verify that for all cloud sites you have locally registered the vCloud Availability Replicator instance to the vCloud Availability Replication Manager instance.
- Verify that the vCloud Availability Tunnel instance is configured with a vCenter Server Lookup service address. For more information, see [Configure a vCloud Availability Tunnel Instance](#)

Procedure

- 1 Log in to the vCloud Availability vApp Replication Manager service management interface.
 - a Open a Web browser and 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 8047 . For example, <code>https://Tunnel-Appliance-IP-address:8047</code> .
Appliance user	The vCloud Availability Tunnel appliance root user.
Password	The password for the vCloud Availability Tunnel appliance root user.

- 4 Accept the vCloud Availability Tunnel SSL certificate.
- 5 If you are using vCloud Availability 3.0 to apply the tunnel configuration restart vCloud Availability Tunnel, see [Restart the vCloud Availability Services](#).
- 6 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.

Restart the vCloud Availability Services

If you use vCloud Availability 3.0, after configuring the solution in a site, you restart all vCloud Availability services in a combined appliance from the **System Monitoring** page. To restart the services that are in dedicated appliances, log in to each appliance.

Depending on the vCloud Availability appliance deployment type, you restart the services in the following order.

Procedure

- 1 Log in to the vCloud Availability vApp Replication Manager service management interface.
 - a Open a Web browser and 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 Restart the vCloud Availability vApp Replication Manager and the vCloud Availability Replication Manager service.
 - a In the left pane, click **System Monitoring**.
 - b Under **System health**, click **Restart service**.
 - c In the **Restart service** window, confirm the services restart by clicking **Restart**.
- 3 In a Web browser, go to the vCloud Availability Replicator service management interface for your deployment type.

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

- 4 Restart the vCloud Availability Replicator service.
 - a In the left pane, click **System Monitoring**.
 - b Under **System health**, click **Restart service**.
 - c In the **Restart service** window, confirm the service restart by clicking **Restart**.
- 5 In a Web browser, go to the vCloud Availability Tunnel service management interface for your deployment type.

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

- 6 Restart the vCloud Availability Tunnel service.
 - a In the left pane, click **System Monitoring**.
 - b Under **System health**, click **Restart service**.
 - c In the **Restart service** window, confirm the service restart by clicking **Restart**.

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 VMware vCloud Availability Services 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 a vCloud Availability Replicator Instance with a vCloud Availability Replication Manager Instance in the Same Site](#).

Procedure

- 1 Add a vCloud Availability Replicator.
 - a In a Web browser, go to **`https://Replication-Manager-IP-address:8441/ui/admin`**.
The vCloud Availability Replication Manager service management interface login page displays.
 - b Log in as **root**.
 - c In the **Replicators** tab, click **New**.
The **New Replicator** wizard displays.
 - d Select the site to which you add the new vCloud Availability Replicator instance.
 - e (Optional) Add a description for the vCloud Availability Replicator.
 - f In the **API URL** text box, enter the vCloud Availability Replicator appliance address and port **443**.
For example, **`https://Replicator-Appliance-IP-address:443`**.
 - g Enter the appliance **root** password that you set during the initial vCloud Availability Replicator configuration.
 - h Enter the single sign-on domain administrator user name and password.
For example, **`administrator@vsphere.local`**.
 - i Click **Add**.
 - j To complete the addition, 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 the left pane, click **Configuration** and next to **Tunnel address** click **Edit**.
The **Tunneling settings** window opens.
 - b Enter the credentials for the vCloud Availability Tunnel appliance and click **Apply**.
 - c If you are running vCloud Availability 3.0, 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 vCloud Availability vApp Replication Manager service management interface.
 - a Open a Web browser and 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 VMware vCloud Availability

4

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

Upgrade Paths

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

Table 4-1. vCloud Availability Upgrade Path

Currently Installed vCloud Availability Version	Next vCloud Availability Version	Upgrade Method
vCloud Availability 3.0.x	vCloud Availability 3.0.y	Upgrade by using the service management interface, see Upgrading vCloud Availability by Using the Service Management Interface .
vCloud Availability 3.0	vCloud Availability 3.0.y	Upgrade by using the appliance command-line interface, see Command-Line Upgrading .

Upgrade Repository

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

Table 4-2. vCloud Availability Upgrade Repositories

Repository	Description
Default VMware repository	Use the default repository when your environment 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 when your environment does not allow the 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 when your environment does not allow the external Internet access. Also, use the local repository when the vCloud Availability appliances are deployed in multiple datastores.

This chapter includes the following topics:

- [Order of Upgrading the VMware vCloud Availability Components](#)
- [Command-Line Upgrading](#)
- [Upgrading vCloud Availability by Using the Service Management Interface](#)
- [Install the vCloud Availability Plug-In for vCloud Director](#)
- [Configure vCloud Availability Post-Upgrade](#)

Order of Upgrading the VMware vCloud Availability Components

To upgrade the VMware vCloud Availability solution, upgrade each vCloud Availability component according to a specific order.

First you upgrade all vCloud Availability components in the local site, then upgrade all components in the remote site.

You upgrade all vCloud Availability components in the following order.

- 1 Upgrade all vCloud Availability vApp Replication Manager instances.
- 2 Upgrade all vCloud Availability Replication Manager instances.
- 3 Upgrade all vCloud Availability Replicator instances.
- 4 Upgrade all vCloud Availability Tunnel instances.

Note During the upgrade process, you might observe replication interruptions and Recovery Point Objective (RPO) violations.

Command-Line Upgrading

To upgrade from version 3.0, you must use the command-line interface of each of the appliances.

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 [Order of Upgrading the VMware vCloud Availability Components](#).
- 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 Log in by using the **root** user credentials.
- 2 Check for upgrades.

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

- 3 Install the upgrade.

```
/usr/bin/sudo /opt/vmware/bin/vamcli 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 [Order of Upgrading the VMware vCloud Availability Components](#).

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/vamcli update --repo cdrom://
```

- c Check for upgrades.

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

- d Install the upgrade.

```
/usr/bin/sudo /opt/vmware/bin/vamcli 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 [Order of Upgrading the VMware vCloud Availability Components](#).

- 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/vamcli update --repo specified-repository-URL
```

- c Check for upgrades.

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

- d Install the upgrade.

```
/usr/bin/sudo /opt/vmware/bin/vamcli 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](#).

Upgrading vCloud Availability by Using the Service Management Interface

To upgrade the vCloud Availability components from version 3.0.x, you can use the service management interface of each of the components.

Note When upgrading from vCloud Availability 3.0, you must follow the [Command-Line Upgrading](#) procedure. Use the service management interface only if starting to upgrade from vCloud Availability 3.0.x.

Upgrade vCloud Availability Components by Using the Default Repository

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

Procedure

- 1 Log in to the service management interface for the following vCloud Availability components.
 - a Open a Web browser and go to the following management interface address.

Table 4-3. Services Management Interface Addresses

VMware vCloud Availability Component	Management Interface Address and Port
vCloud Availability vApp Replication Manager	<code>https://Appliance-IP-Address:8046/ui/admin</code>
vCloud Availability Replication Manager	<code>https://Appliance-IP-Address:8044/ui/admin</code>
vCloud Availability Replicator	<code>https://Appliance-IP-Address:8043/ui/admin</code>
vCloud Availability Tunnel	<code>https://Appliance-IP-Address:8047/ui/admin</code>

- b Log in by using the **root** user credentials.
- 2 Install updates.
 - a On the **Configuration** tab, click **Edit** against the **Update repository** entry .
 - b Select **Use Default Repository** and click **Apply**.
 - c Click **Check for update** against the **Product version** entry.
 - d Click **Update** and wait for the update to install.

The appliance restarts automatically.

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](#).

Upgrade vCloud Availability Components 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 component appliance.

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 file to a vCloud Availability appliance.
 - a Log in to the vSphere Client on the site where you want to upgrade vCloud Availability.
 - b In 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 for the following vCloud Availability components.

- a Open a Web browser and go to the following management interface address.

Table 4-4. Services Management Interface Addresses

VMware vCloud Availability Component	Management Interface Address and Port
vCloud Availability vApp Replication Manager	https://Appliance-IP-Address:8046/ui/admin
vCloud Availability Replication Manager	https://Appliance-IP-Address:8044/ui/admin
vCloud Availability Replicator	https://Appliance-IP-Address:8043/ui/admin
vCloud Availability Tunnel	https://Appliance-IP-Address:8047/ui/admin

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

- 5 Install updates.

- a On the **Configuration** tab, click **Edit** against the **Update repository** entry .
 - b Select the **Use CDROM Updates** option and click **Apply**.
 - c Click **Check for update** against the **Product version** entry.
 - d Click **Update** and wait for the update to install.

The appliance restarts automatically.

- 6 Unmount the ISO image.

- a In the vSphere Client, shut down the virtual machine that hosts the vCloud Availability component.
 - b Right-click the virtual machine and select **Edit Settings**.
 - c In the **Virtual Hardware** tab, select **CD/DVD Drive** and deselect **Connected** and **Connect At Power On**.
 - d Power on the virtual machine.

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](#).

Upgrade vCloud Availability Components by Using a Specified Repository

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

Procedure

- 1 Prepare the local 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-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 for the following vCloud Availability components.
 - a Open a Web browser and go to the following management interface address.

Table 4-5. Services Management Interface Addresses

VMware vCloud Availability Component	Management Interface Address and Port
vCloud Availability vApp Replication Manager	https://Appliance-IP-Address:8046/ui/admin
vCloud Availability Replication Manager	https://Appliance-IP-Address:8044/ui/admin
vCloud Availability Replicator	https://Appliance-IP-Address:8043/ui/admin
vCloud Availability Tunnel	https://Appliance-IP-Address:8047/ui/admin

- b Log in by using the **root** user credentials.
- 3 Install updates.
 - a On the **Configuration** tab, click **Edit** against the **Update repository** entry .
 - b Select the **Use Specified Repository** option.
 - c Enter the URL address of the local repository by pointing to the update directory of the local Web server.

For example, <http://local-web-server-address/update>.
 - d To authenticate to the repository, enter your user name and password.
 - e Click **Apply**.
 - f Click **Check for update** against the **Product version** entry.
 - g Click **Update** and wait for the update to install.

The appliance restarts automatically.

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](#).

Install the vCloud Availability Plug-In for vCloud Director

To access the vCloud Availability Portal from the **vCloud Director Service Provider Admin Portal** and the **vCloud Director Tenant Portal**, you must install the vCloud Availability plug-in for vCloud Director.

Procedure

- 1 Log in to the vCloud Availability Service Provider Portal.
 - a In a Web browser, go to `https://vApp-Replication-Manager-IP-address/ui/admin`.
 - b Log in as **root**.
- 2 Install the vCloud Availability plug-in for vCloud Director.
 - a Navigate to the **Configuration** tab and click **Edit** against the **vCloud Director address** entry.
 - b Select the configuration type and click **Apply**.

If you select **Discover** the vCloud Director Service address automatically, proceed to [Step 3](#).

If you select **Enter details** for the vCloud Director Service manually, proceed to [Step 2c](#).

Option	Description
Discover the vCloud Director Service address automatically	By default, this option is selected. Use the option if the following configurations are present in your environment: <ul style="list-style-type: none"> ■ vCloud Director is federated with a previously specified Lookup service. ■ There is only one registered vCloud Director in the Lookup service. ■ The single sign-on user belongs to the System administrator group in vCloud Director.
Enter details for the vCloud Director Service manually	Select this option, if your vCloud Director instance is not federated with a previously specified Lookup service or if multiple vCloud Director instances are registered to the Lookup service.

- c Enter the vCloud Director URL in the following format: `https://vCloud Director-IP-address:443/api`.
- d Enter a vCloud Director **System administrator** user name and password, and click **Next**.
 For example `administrator@system`, where *system* is the name of the system organization of vCloud Director.
 The vCloud Director certificate details display.
- e To finish the vCloud Director configuration, accept the vCloud Director SSL certificate.

- 3 In the **System Monitoring** tab, click **Restart Service** and confirm the operation.

Results

You successfully installed the vCloud Availability plug-in for vCloud Director and can access the vCloud Availability Portal directly from the vCloud Director user interface.

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. Re-enable the tunneling service and re-establish the trust between the cloud sites.

If you are upgrading from version 3.0.x, you can skip this entire procedure.

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 the [Administering vCloud Availability](#) document.

Procedure

- 1 Log in to the vCloud Availability vApp Replication Manager service management interface.
 - a Open a Web browser and 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 are upgrading from version 1.5.x to version 3.0.0, enter a valid license key.
 - a In the left pane, click **Configuration**.
 - b Under **Licensing** next to **License key**, click **Edit**.
 - c Enter the license key and click **Apply**.
 - d Verify that you see no errors for the **License key** entry.
- 3 Re-enable the vCloud Availability Tunnel instance.
- 4 Re-establish the cloud to cloud trust.
- 5 If you are upgrading from version 1.5.x, set up the NTP server.
 - a Open an SSH connection to the vCloud Availability vApp Replication Manager appliance.
 - b Log in as the **root** user.
 - c Open the `/etc/systemd/timesyncd.conf` file by using a text editor.

- d Set up the NTP server by modifying the following entry.

NTP= **NTP-Server-Address**

Note In one site, use the same NTP server for all vCloud Availability appliances.

- e Save the changes and exit the text editor.
- f Restart the time synchronization service.

```
systemctl restart systemd-timesyncd
```

- 6 If you are upgrading from version 1.5.x, allow incoming and outgoing replications.
 - a In the left pane, click **Policies**.
 - b Select the **Default Policy** and click **Edit**.
 - c In the **Edit Policy** window, enable **Allow outgoing replications** and **Allow incoming replications**.
 - d Click **Apply**.

To configure new replications, the policies that are assigned to the source and the destination organizations must allow incoming and outgoing replications.

Results

vCloud Availability is successfully upgraded and you can configure new replications. For more information, see the [vCloud Availability User's Guide](#) document.