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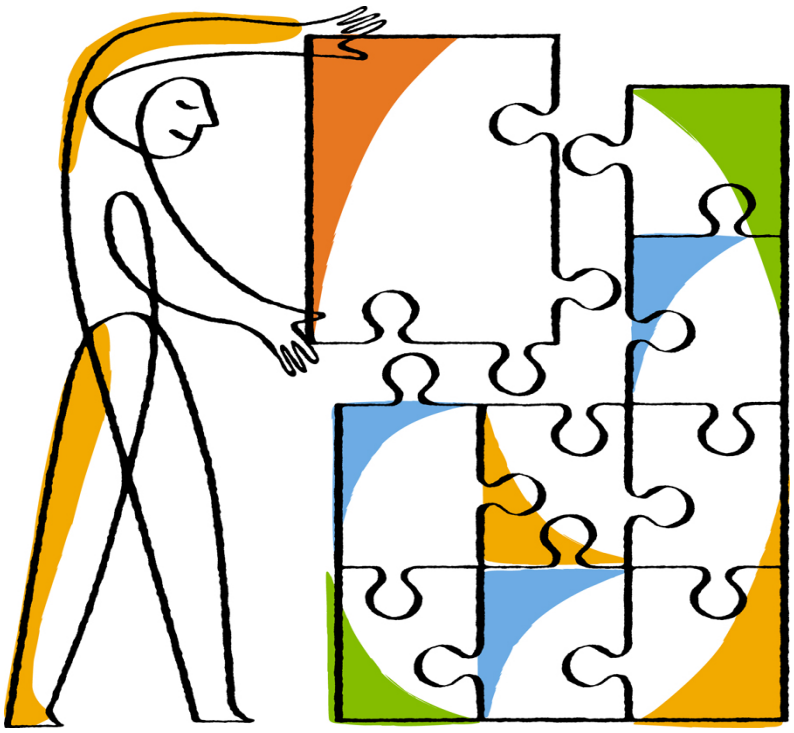
## SnapCenter Plug-in for VMware vSphere 4.3

# Deployment Guide



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# SnapCenter Plug-in for VMware vSphere 4.3

## Data Protection Guide

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NetApp®

# Contents

# Deciding whether to read the Deployment Guide for SnapCenter Plug-in for VMware vSphere

This information describes how to deploy and remove the SnapCenter Plug-in for VMware vSphere, which is a standalone virtual appliance (Open Virtual Appliance format). It also describes how to register the plug-in with SnapCenter Server to support application-consistent backup and restore operations that are run by application-based SnapCenter plug-ins.

# Overview of SnapCenter Plug-in for VMware vSphere

For SnapCenter 4.2 and later, SnapCenter Plug-in for VMware vSphere is deployed as a Linux-based virtual appliance.

The SnapCenter VMware plug-in adds the following functionality to your environment:

- Support for VM-consistent and crash-consistent data protection operations for VMware virtual machines (VMs) and datastores.
- Support for SnapCenter application-consistent (application over VMDK/RDM) data protection operations for databases and file systems on primary and secondary storage on VMs.
- Support for VMs, VMDKs, and datastores
  The SnapCenter VMware plug-in provides a VMware vSphere web client in vCenter. You use the web client GUI to perform VM-consistent backups of VMs, VMDKs, and datastores. You can also restore VMs and VMDKs, and restore files and folders that reside on a guest OS.

  **NOTE**: When backing up VMs, VMDKs, and datastores, the plug-in does not support RDMs. Backup jobs for VMs ignore RDMs. If you need to back up RDMs, you must use a SnapCenter application-based plug-in.

  The SnapCenter VMware plug-in includes a MySQL database that contains the SnapCenter VMware plug-in metadata.
- Support for virtualized databases
  The SnapCenter VMware plug-in supports backup, recovery, and cloning of virtualized applications and file systems (for example, virtualized SQL, Oracle, and Exchange databases) when you have the appropriate application-based SnapCenter plug-ins installed and you are using SnapCenter to perform data protection operations. These data protection operations are managed using the SnapCenter GUI.
  SnapCenter natively leverages the SnapCenter VMware plug-in for all data protection operations on VMDKs, raw device mappings (RDMs), and NFS datastores. After the virtual appliance is deployed, the plug-in handles all interactions with vCenter. The SnapCenter VMware plug-in supports all SnapCenter application-based plug-ins.

  **NOTE**: SnapCenter does not support single Snapshot copies of databases and VMs together. Backups for VMs and databases must be scheduled and run independently, which creates separate Snapshot copies, even if the databases and VMs are hosted in the same volume. Database application backups must be scheduled by using the SnapCenter GUI; VM and datastore backups must be scheduled by using the SnapCenter vSphere web client GUI.
- VMware Tools is required for VM consistent Snapshot copies
  If VMware Tools is not installed and running, the file system is not quiesced and a crash-consistent Snapshot is created.
- VMware Storage vMotion is required for restore operations in SAN (VMFS) environments
  The restore workflow for VMware file system (VMFS) utilizes the VMware Storage vMotion feature. Storage vMotion is a part of the vSphere Standard License but is not available with the vSphere Essentials or Essentials Plus licenses.
  Most restore operations in NFS environments use native ONTAP functionality (for example, Single File SnapRestore) and do not require VMware Storage vMotion.
- The SnapCenter VMware plug-in is deployed as a virtual appliance in a Linux VM
  Although the virtual appliance must be installed as a Linux VM, the SnapCenter VMware plug-in supports both Windows-based and Linux-based vCenters. SnapCenter natively

uses this plug-in without user intervention to communicate with your vCenter to support SnapCenter application-based plug-ins that perform data protection operations on Windows and Linux virtualized applications.

In addition to these major features, the SnapCenter Plug-in for VMware vSphere also provides support for iSCSI, Fibre Channel, FCoE, VMDK over NFS 3.0 and 4.1, and VMDK over VMFS 5.0 and 6.0.

For the latest information about supported versions, see the NetApp Interoperability Matrix Tool (IMT).

For information about NFS protocols and ESXi, see the VMware "vSphere Storage" documentation.

For information about SnapCenter data protection, see the Data Protection Guide for your SnapCenter plug-in in the SnapCenter Documentation Center.

For information about data protection using the SnapCenter VMware plug-in, see the SnapCenter Plug-in for VMware vSphere Data Protection Guide.

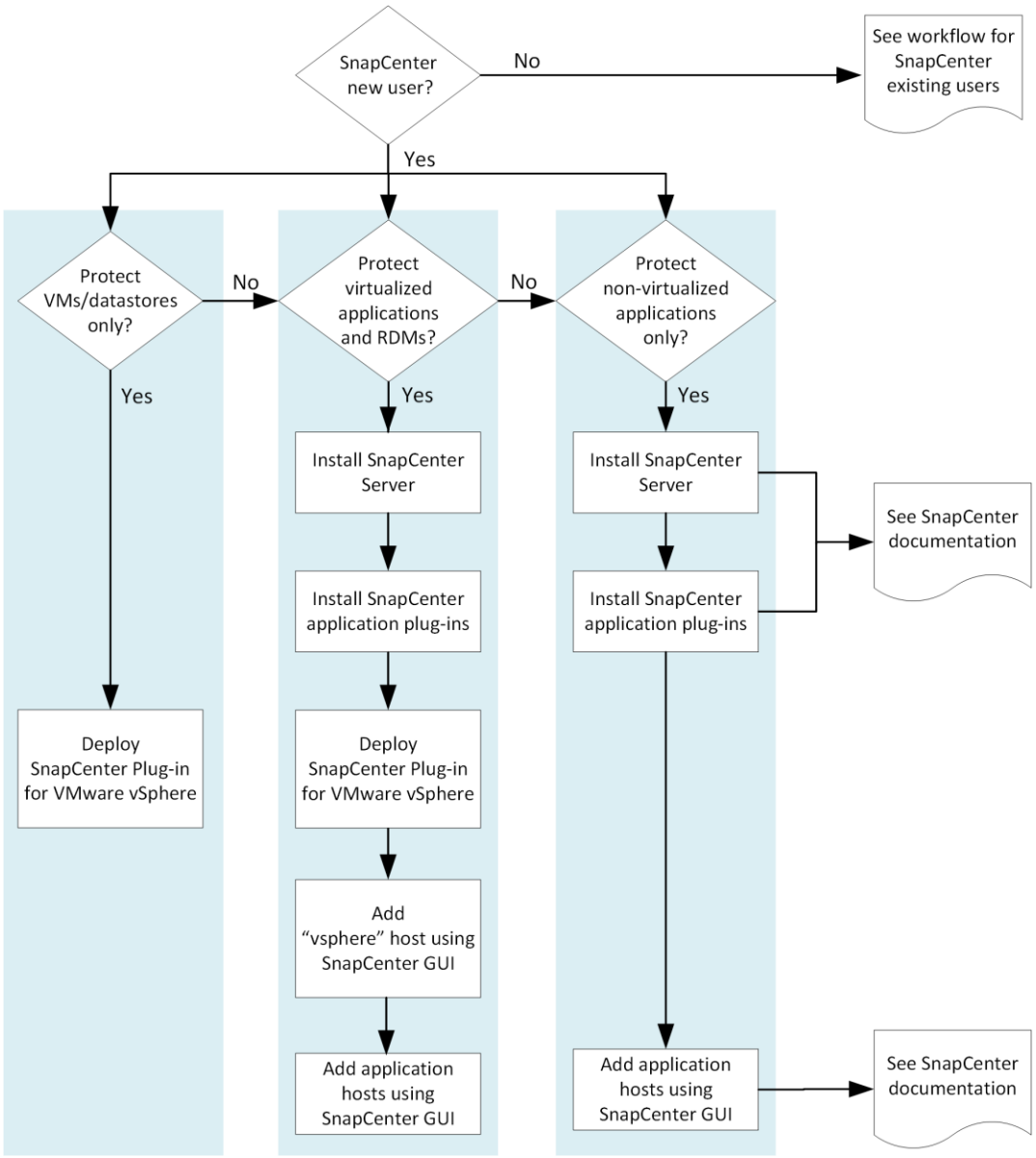
For information about supported upgrade and migration paths, see the SnapCenter Plug-in for VMware vSphere Release Notes.

# Getting started workflows

Existing SnapCenter users must use a different deployment workflow from new SnapCenter users.

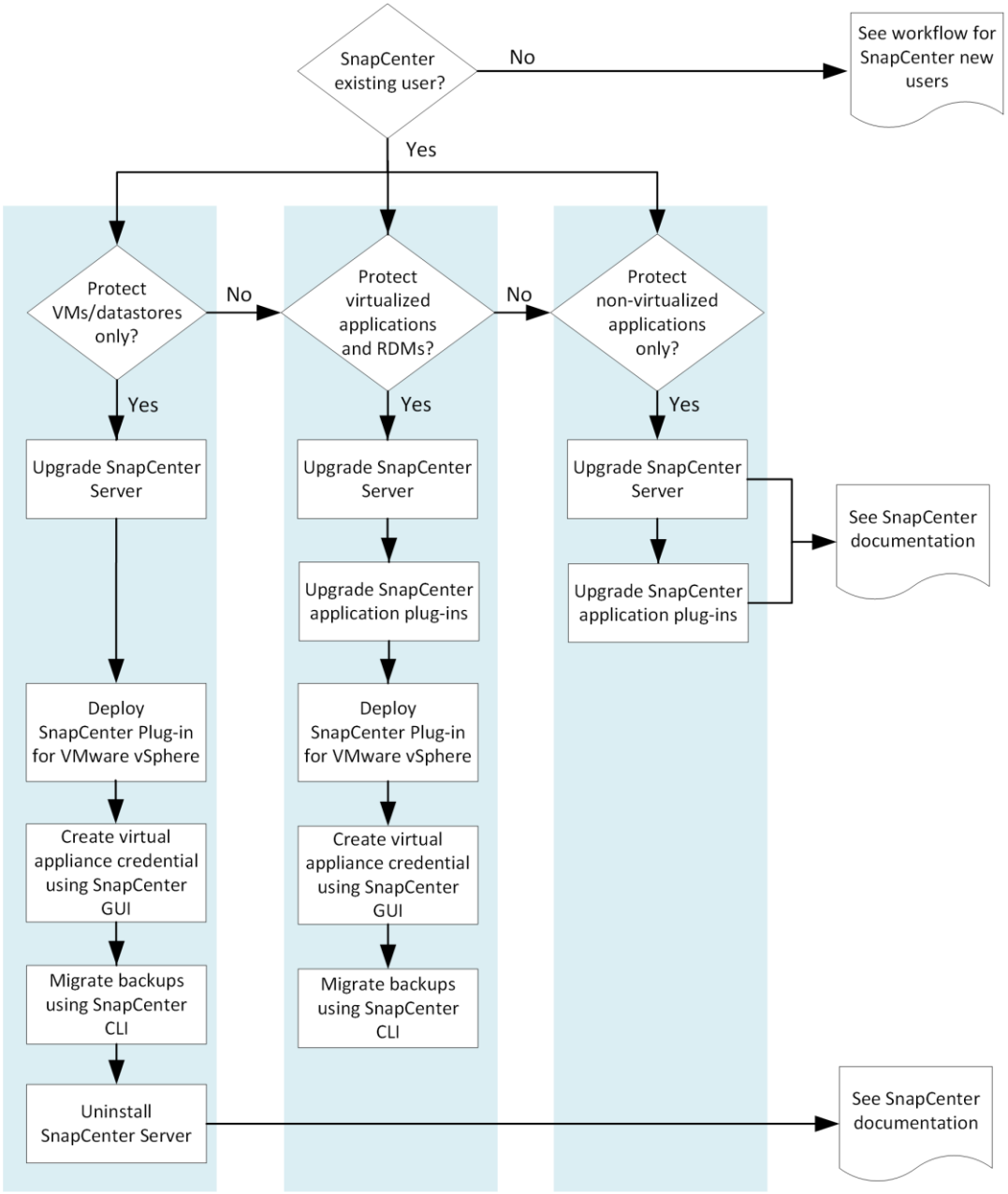
## SnapCenter deployment for new users

If you have not used SnapCenter before and do not have any SnapCenter backups, then use this workflow to get started.




## SnapCenter deployment for existing users

If you are a SnapCenter user and have SnapCenter backups, then use this workflow to get started.


SnapCenter existing user?
No
See workflow for SnapCenter new users
Yes
Protect VMs/datastores only?
No
Protect virtualized applications and RDMs?
No
Protect non-virtualized applications only?
Yes
Yes
Yes
Upgrade SnapCenter Server
Upgrade SnapCenter Server
Upgrade SnapCenter Server
Upgrade SnapCenter application plug-ins
Upgrade SnapCenter application plug-ins
See SnapCenter documentation
Deploy SnapCenter Plug-in for VMware vSphere
Deploy SnapCenter Plug-in for VMware vSphere
Create virtual appliance credential using SnapCenter GUI
Create virtual appliance credential using SnapCenter GUI
Migrate backups using SnapCenter CLI
Migrate backups using SnapCenter CLI
Uninstall SnapCenter Server
See SnapCenter documentation

# Adding SnapCenter licenses

SnapCenter Plug-in for VMware vSphere is a free product if you are using the following storage systems:

- FAS
- AFF
- Cloud Volumes ONTAP
- ONTAP Select

**TIP**: You should add SnapCenter Standard licenses to secondary destinations. If SnapCenter Standard licenses are not enabled on secondary systems, you cannot use SnapCenter after performing a failover operation. However, a FlexClone license on secondary storage is required to perform mount and attach operations. A SnapRestore license is required to perform restore operations.

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# Deploying SnapCenter Plug-in for VMware vSphere

For SnapCenter 4.2 and later, SnapCenter Plug-in for VMware vSphere is deployed as a Linux-based virtual appliance.

## Deployment planning and requirements

You should be aware of the deployment requirements before you deploy the virtual appliance.

### Host requirements

Before you begin deployment of SnapCenter Plug-in for VMware vSphere, you should be familiar with the host requirements.

- You must deploy the SnapCenter VMware plug-in as a Linux VM.

  The SnapCenter VMware plug-in is deployed as a Linux VM regardless of whether you use the plug-in to protect data on Windows systems or Linux systems.

- You should deploy the SnapCenter VMware plug-in on the vCenter Server.
  Backup schedules are executed in the time zone in which the SnapCenter VMware plug-in is deployed. vCenter reports data in the time zone in which the vCenter is located. Therefore, if the SnapCenter VMware plug-in and vCenter are in different time zones, data in the SnapCenter VMware plug-in Dashboard might not be the same as the data in the reports.
- You must not deploy the SnapCenter VMware plug-in in a folder that has a name with special characters.

  The folder name should not contain the following special characters:
  `$!@#%^&()_+{}';.,*?"<>|`

- You must deploy and register a separate, unique instance of the SnapCenter VMware plug-in for each vCenter Server.
  - Each vCenter Server, whether or not it is in Linked Mode, must be paired with a separate instance of the SnapCenter VMware plug-in.
  - Each instance of the SnapCenter VMware plug-in must be deployed as a separate Linux VM.

    For example, if you want to perform backups from six different instances of the vCenter Server, then you must deploy the SnapCenter VMware plug-in on six hosts and each vCenter Server must be paired with a unique instance of the SnapCenter VMware plug-in.
- The SnapCenter VMware plug-in provides limited support of shared PCI or PCIe devices (for example, NVIDIA Grid GPU) due to a limitation of the virtual machines in supporting Storage vMotion. For more information, see the vendor's document *Deployment Guide for VMware*.
  - What is supported:
    - Creating resource groups
    - Creating backups without VM consistency
    - Restoring a complete VM when all the VMDKs are on an NFS datastore and the plug-in does not need to use Storage vMotion
    - Attaching and detaching VMDKs
    - Mounting and unmounting datastores
    - Guest file restores
  - What is not supported:
    - Creating backups with VM consistency
    - Restoring a complete VM when one or more VMDKs are on a VMFS datastore.

- For a detailed list of the SnapCenter VMware plug-in limitations, see the *SnapCenter Plug-in for VMware vSphere Release Notes*

### Licensing requirements

The type of licenses you install depends on your environment.

| You must provide licenses for… | License requirement |
|---|---|
| ONTAP | One of these: SnapMirror or SnapVault (for secondary data protection regardless of the type of relationship) |
| Additional products | vSphere Standard, Enterprise, or Enterprise Plus<br>A vSphere license is required to perform restore operations, which use Storage vMotion. vSphere Essentials or Essentials Plus licenses do not include Storage vMotion. |
| Primary destinations | To perform application-based protection over VMware<br>SnapCenter Standard<br>To perform protection of VMware VMs and datastores only<br>SnapRestore: used for restore operations<br>FlexClone: used for mount and attach operations |
| Secondary destinations | To perform application-based protection over VMware<br>SnapCenter Standard: used for failover operations<br>To perform protection of VMware VMs and datastores only<br>FlexClone: used for mount and attach operations |

### Software support

| Item | Supported versions |
|---|---|
| vCenter vSphere | Flex client: 6.0U3, 6.5U2/U3, 6.7*x*<br>HTML5 client: 6.5U2d/U3, 6.7*x*, 7.0 |
| ESXi | 5.5, 6.0 or later |
| IP addresses | IPv4, IPv6 |
| Java | 8 |
| .Net Core | 2.1 |
| SnapCenter Plug-in for VMware vSphere MySQL database | MySQL 8.0.16 |
| VMware TLS | 1.2 |
| TLS on the SnapCenter Server | TLSv1.1 and later<br>The SnapCenter Server uses this to communicate with the SnapCenter VMware plug-in for application over VMDK data protection operations. |

For the latest information about supported versions, see the NetApp Interoperability Matrix Tool (IMT).

### Space and sizing requirements

| Item | Requirements |
|---|---|
| Operating system | Linux |
| Minimum CPU count | 4 cores |
| Minimum RAM | Minimum: 12 GB<br>Recommended: 16 GB |
| Minimum hard drive space for the SnapCenter Plug-in for VMware vSphere, logs, and MySQL database | 100 GB |

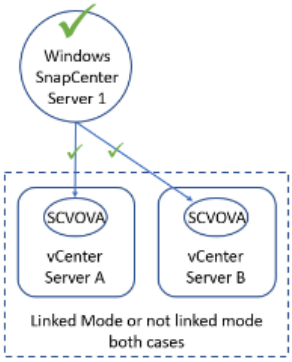
### Connection and port requirements

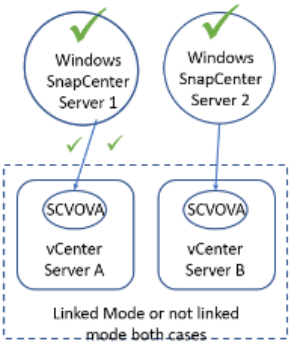
| Type of port | Preconfigured port |
|---|---|
| SnapCenter Plug-in for VMware vSphere port | 8144 (HTTPS), bidirectional |

| | |
|---|---|
| | The port is used for communications from the SnapCenter vSphere web client and from the SnapCenter Server.<br>8080 bidirectional<br>This port is used to manage the virtual appliance.<br>**NOTE**: You cannot modify the port configuration. |
| VMware vSphere vCenter Server port | 443 (HTTPS), bidirectional<br>The port is used for communication between the storage VM host for SnapCenter Plug-in for VMware vSphere and vCenter. |

### Configurations supported

Each plug-in instance supports only one vCenter Server. vCenters in linked mode are supported. Multiple plug-in instances can support the same SnapCenter Server.




### RBAC privileges required

The vCenter administrator account must have the required vCenter privileges.

| To do this operation… | You must have these vCenter privileges… |
|---|---|
| Deploy and register the SnapCenter Plug-in for VMware vSphere in vCenter | Extension: Register extension |
| Upgrade or remove the SnapCenter Plug-in for VMware vSphere | Extension<br>• Update extension<br>• Unregister extension |
| Allow the vCenter Credential user account registered in SnapCenter to validate user access to the SnapCenter Plug-in for VMware vSphere | sessions.validate.session |
| Allow users to access the SnapCenter Plug-in for VMware vSphere | SCV Administrator<br>SCV Backup<br>SCV Guest File Restore<br>SCV Restore<br>SCV View<br>The privilege must be assigned at the vCenter root. |

### AutoSupport

The SnapCenter Plug-in for VMware vSphere provides a minimum of information for tracking its usage, including the plug-in URL. AutoSupport includes a table of installed plug-ins that is displayed by the AutoSupport viewer.

## Downloading the SnapCenter Plug-in for VMware vSphere OVA (Open Virtual Appliance)

You can download the `.ova` file for SnapCenter Plug-in for VMware vSphere from the NetApp Support Site. The `.ova` file includes a set of microservices for VM and datastore data protection,

which are performed by the SnapCenter VMware plug-in. When the deployment is complete, all components are installed on a Linux VM in your environment.

**Steps**

1. Log in to the NetApp Support Site (https://mysupport.netapp.com/products/index.html).
2. From the list of products, select **SnapCenter Plug-in for VMware vSphere**, then click the **DOWNLOAD LATEST RELEASE** button.
3. Download the SnapCenter Plug-in for VMware vSphere `.ova` file to any location.

## Deploying SnapCenter Plug-in for VMware vSphere

To use SnapCenter features to protect VMs, datastores, and application-consistent databases on virtualized machines, you must deploy SnapCenter Plug-in for VMware vSphere.

**Before you begin**

- You must have read the deployment requirements.
  The deployment wizard does not verify the space requirement. If you do not have enough space on the host, the deployment might look successful, but the virtual appliance will not boot up.
- You must be running a supported version of vCenter Server.
- You must have configured and set up your vCenter Server environment.
- You must have set up an ESXi host for the SnapCenter VMware plug-in VM.
- You must have downloaded the SnapCenter Plug-in for VMware vSphere `.ova` file.
- You must have the login credentials for your vCenter Server instance.
- You must have logged out of and closed all browser sessions of vSphere Web Client and deleted the browser cache to avoid any browser cache issue during the deployment of the SnapCenter VMware plug-in.
- You must have enabled Transport Layer Security (TLS) in vCenter. Refer to the VMware documentation.
- You can deploy the SnapCenter VMware plug-in in the same vCenter as the virtual appliance for VSC 7.x and later.
- If you plan to perform backups in vCenters other than the one in which the SnapCenter VMware plug-in is deployed, then the ESXi server, the SnapCenter VMware plug-in, and each vCenter must be synchronized to the same time.

> **TIP**: Deploy the SnapCenter VMware plug-in in the same time zone as the vCenter. Backup schedules are executed in the time zone in which the SnapCenter VMware plug-in is deployed. vCenter reports data in the time zone in which the vCenter is located. Therefore, if the SnapCenter VMware plug-in and vCenter are in different time zones, data in the SnapCenter VMware plug-in Dashboard might not be the same as the data in the reports.

**Steps**

1. In your browser, navigate to VMware vSphere vCenter.
2. On the VMware screen, click **vSphere Web Client (Flex** or **HTML5)**.

   > **NOTE**: vCenter vSphere 7.0 does not support Flex clients.

3. Log in to the **VMware vCenter Single Sign-On** page.

4. On the Navigator pane, right-click any inventory object that is a valid parent object of a virtual machine, such as a datacenter, folder, cluster, or host, and select **Deploy OVF Template** to start the VMware deploy wizard.
5. On the **Select an OVF template** page, specify the location of the `.ova` file and click **Next**.

| If you downloaded the `.ova` file to… | Do this… |
|---|---|
| An internet location | Enter the URL. Supported URL sources are HTTP and HTTPS. |
| A local file | Click **Choose Files** and navigate to the `.ova` file. |

6. On the **Select a name and folder** page, enter a unique name for the VM or vApp, and select a deployment location, and then click **Next**.

   This step specifies where to import the `.ova` file into vCenter. The default name for the VM is the same as the name of the selected `.ova` file. If you change the default name, choose a name that is unique within each vCenter Server VM folder.

   The default deployment location for the VM is the inventory object where you started the wizard.
7. On the **Select a resource** page, select the resource where you want to run the deployed VM template, and click **Next**.
8. On the **Review details** page, verify the `.ova` template details and click **Next**.
9. On the **License agreements** page, select the checkbox for **I accept all license agreements**.
10. On the **Select storage** page, define where and how to store the files for the deployed OVF template.
    a. Select the disk format for the VMDKs.
    b. Select a VM Storage Policy.

       This option is available only if storage policies are enabled on the destination resource.
    c. Select a datastore to store the deployed OVA template.

       The configuration file and virtual disk files are stored on the datastore.

       Select a datastore large enough to accommodate the virtual machine or vApp and all associated virtual disk files.
11. On the **Select networks** page, select a source network and map it to a destination network, and then click **Next**.

    The Source Network column lists all networks that are defined in the OVA template.

    **NOTE**: SnapCenter Plug-in for VMware vSphere supports one network interface. If you need multiple network adapters, you must set that up manually. See the KB article: How to set up multiple network adapters.

    On the **Customize template** page, do the following:
    a. In **Register to existing vCenter**, enter the vCenter virtual appliance credentials.
    b. In **Create SnapCenter Plug-in for VMware vSphere credentials**, enter the credentials.

       **IMPORTANT**: Make a note of the username and password that you specify. You need to use these credentials if you want to modify the SnapCenter VMware plug-in configuration later.
    c. In **Setup Network Properties**, enter the network information.

       Select the IPv4 or IPv6 fields, or both, if appropriate. If you are using both IPv4 and IPv6, then you need to specify the Primary DNS for only one of them.

d. In **Setup Date and Time**, select the time zone where the vCenter is located.

12. On the **Ready to complete** page, review the page and click **Finish**.

    **NOTE**: All hosts must be configured with IP addresses (FQDN hostnames are not supported). The deploy operation does not validate your input before deploying.

    You can view the progress of the deployment from the Recent Tasks window while you wait for the OVF import and deployment tasks to finish.

    When the SnapCenter VMware plug-in is successfully deployed, it is deployed as a Linux VM, registered with vCenter, and a SnapCenter vSphere web client is installed.

13. Navigate to the VM where the SnapCenter VMware plug-in was deployed, then click the **Summary** tab, and then click the **Power On** box to start the virtual appliance.
14. While the SnapCenter VMware plug-in is powering on, right-click the deployed SnapCenter VMware plug-in and then click **Install VMware tools**.

    The VMware Tools is installed on the VM where the SnapCenter VMware plug-in is deployed. For more information on installing VMware Tools, see the VMware documentation.

    The deployment might take a few minutes to complete. A successful deployment is indicated when the SnapCenter VMware plug-in is powered on, the VMware tools are installed, and the screen prompts you to log in to the SnapCenter VMware plug-in.

    The screen displays the IP address where the SnapCenter VMware plug-in is deployed. Make a note of that location. You need to log in to the SnapCenter VMware plug-in management GUI if you want to make changes to the SnapCenter VMware plug-in configuration.

15. Log in to the SnapCenter VMware plug-in management GUI using the IP address displayed on the deployment screen and the credentials that you provided in the deployment wizard, then verify on the Dashboard that the SnapCenter VMware plug-in is successfully connected to vCenter and is enabled.

    Use the format `https://<appliance-IP-address>:8080` to access the management GUI.

    By default, the maintenance console username is set to “maint” and the password is set to “admin123”.

**After you finish**

- You should complete the required post deployment operations.

## Post deployment required operations and issues

After deploying SnapCenter Plug-in for VMware vSphere, you should complete the required operations.

- If you are a new SnapCenter user, you must add storage VMs to SnapCenter before you can perform any data protection operations. When adding storage VMs, specify the management LIF. You can also add a cluster and specify the cluster management LIF. For information about adding storage, see the *Data Protection Guide for SnapCenter Plug-in for VMware vSphere.*
- If you are an existing SnapCenter user, you must migrate your existing SnapCenter VM and datastore backups and metadata. For information about migrating, see the *Data Protection Guide for SnapCenter Plug-in for VMware vSphere.*
- For information on managing the SnapCenter VMware plug-in, see the *Data Protection Guide for SnapCenter Plug-in for VMware vSphere.*

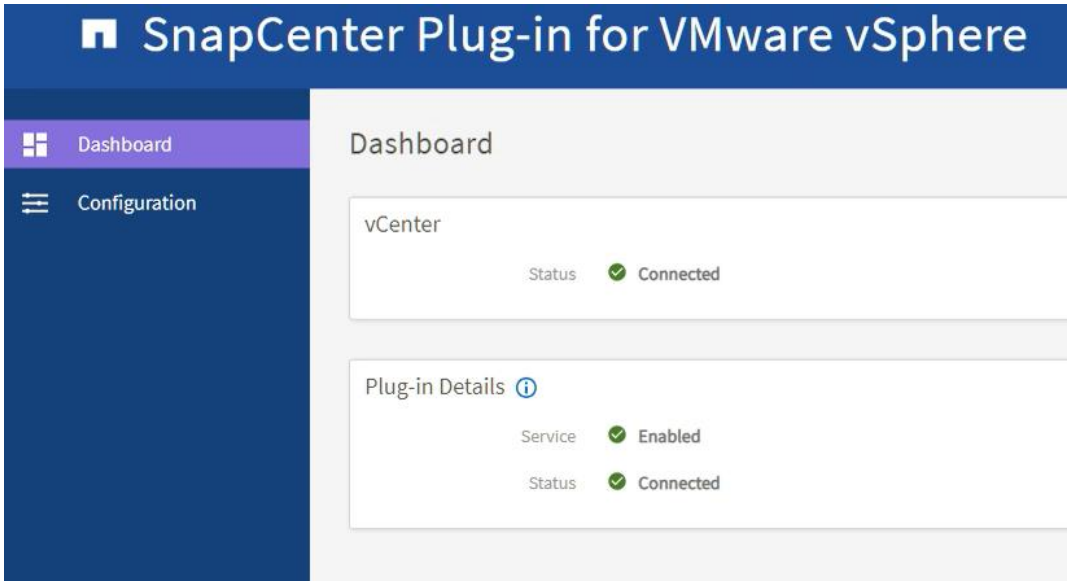
Your deployment might encounter the following issues:

- After deploying the virtual appliance, the **Backup Jobs** tab on the Dashboard might not load in the following scenarios:
  - You are running IPv4 and have two IP addresses for the SnapCenter VMware vSphere host. As a result, the job request is sent to an IP address that is not recognized by the SnapCenter Server. To prevent this issue, add the IP address that you want to use, as follows:
    1. Navigate to the location where the SnapCenter VMware plug-in is deployed: `/opt/netapp/scvservice/standalone_aegis/etc`
    2. Open the file network-interface.properties.
    3. In the `network.interface=10.10.10.10` field, add the IP address that you want to use.
  - You have two NICs.
- After deploying the SnapCenter VMware plug-in, the MOB entry in vCenter for SnapCenter Plug-in for VMware vSphere might still show the old version number. This can occur when other jobs are running in the vCenter. vCenter will eventually update the entry.
- After a deployment, or after an upgrade on a VM where Virtual Storage Console for VMware vSphere (VSC) was previously installed, the following might occur:
  - Right-click menus that are documented for mount, unmount, attach, and detach operations do not appear.
  - The SnapCenter vSphere web client GUI does not match the documentation.
  - The Dashboard is not displayed correctly.
  - During normal use, a page display (for example, the Resource Groups page) might stall or get stuck loading.

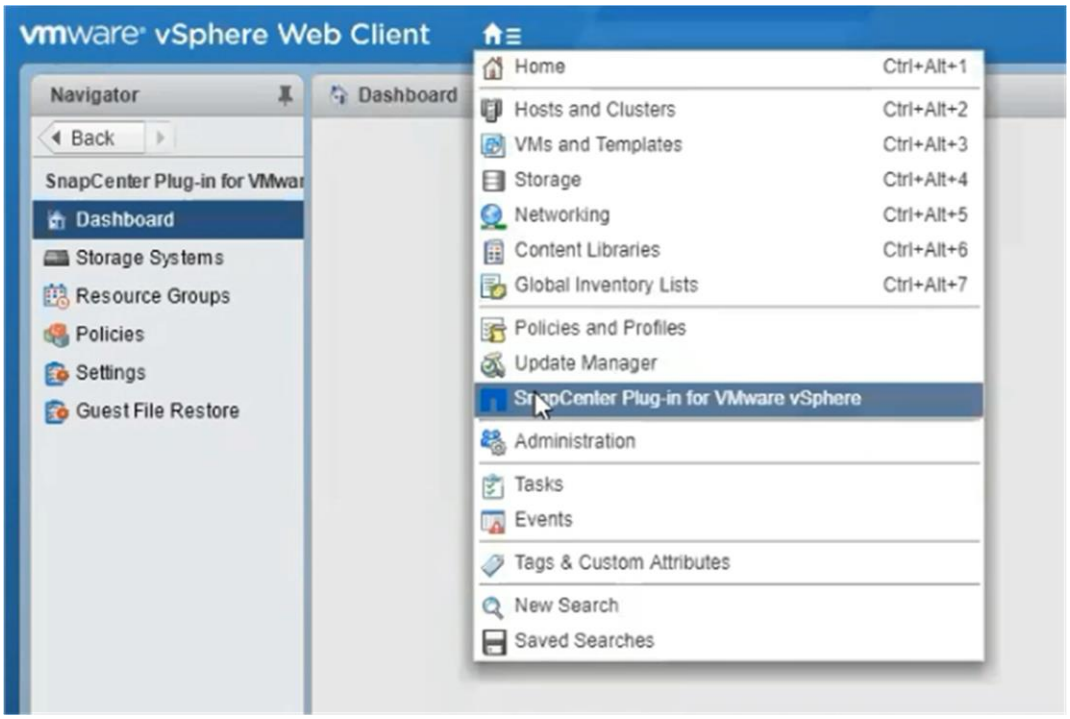
To correct any of these issues, do the following:

1. Clear the browser cache and then check if the GUI is operating properly.

   If the problem persists, then restart the SnapCenter vSphere web client service.




2. Log in to vCenter, then click (Flex home) or **Menu** (HTML5) in the toolbar, and then select **SnapCenter Plug-in for VMware vSphere**.




## Managing authentication errors

If you do not use the Admin credentials, you might receive an authentication error after deploying SnapCenter Plug-in for VMware vSphere or after migrating. If you encounter an authentication error, you must restart the service.

### Steps

1. Log on to the SnapCenter VMware plug-in management GUI using the format `https://<appliance-IP-address>:8080`.
2. Restart the service.

## Creating credentials for migrating backups

If you are a SnapCenter customer and have VM consistent or VM crash-consistent backups, or application-consistent backups of virtualized data, you must migrate those backups to SnapCenter Plug-in for VMware vSphere. Before migrating, you must add the SnapCenter VMware plug-in credentials to SnapCenter Server.

### Before you begin

- You must be running SnapCenter Server 4.2 or later.
- You must have deployed and enabled SnapCenter Plug-in for VMware vSphere.

### Steps

1. In the left navigation pane of the SnapCenter GUI, click **Settings**.
2. In the Settings page, click **Credentials**, and then click **New** to start the wizard.
3. Enter the credential information:

| For this field… | Do this… |
|---|---|
| Credential name | Enter a name for the credentials. |
| Username | Enter the username specified when SnapCenter Plug-in for VMware vSphere was deployed. |

| | |
|---|---|
| Password | Enter the password specified when SnapCenter Plug-in for VMware vSphere was deployed. |
| Authentication | Select **Linux**. |

## Registering SnapCenter Plug-in for VMware vSphere with SnapCenter Server

If you want to perform application-over-VMDK workflows in SnapCenter (application-based protection workflows for virtualized databases and file systems), you must register SnapCenter Plug-in for VMware vSphere with the SnapCenter Server.

**NOTE**: If you are a SnapCenter user and you upgraded to SnapCenter 4.2 and migrated your application-over-VMDK backups to SnapCenter Plug-in for VMware, the migration command automatically registers the plug-in.

### Before you begin

- You must be running SnapCenter Server 4.2 or later.
- You must have deployed and enabled SnapCenter Plug-in for VMware vSphere.

### About this task

- You register SnapCenter Plug-in for VMware vSphere with SnapCenter Server by using the SnapCenter GUI to add a "`vsphere`" type host.

  Port 8144 is predefined for communication within the SnapCenter VMware plug-in.

  **IMPORTANT**: You can register multiple instances of SnapCenter Plug-in for VMware vSphere on the same SnapCenter Server 4.2 to support application-based data protection operations on VMs. You cannot register the same SnapCenter Plug-in for VMware vSphere on multiple SnapCenter Servers.

- For vCenters in Linked Mode, you must register the SnapCenter Plug-in for VMware vSphere for each vCenter.

### Steps

1. In the SnapCenter GUI left navigation pane, click **Hosts**.
2. Verify that the **Managed Hosts** tab is selected at the top, then locate the virtual appliance host name and verify that it resolves from the SnapCenter Server.
3. Click **Add** to start the wizard.
4. On the **Add Hosts** dialog box, specify the host you want to add to the SnapCenter Server:

| For this field… | Do this… |
|---|---|
| Host Type | Select "**vSphere**" as the type of host. |
| Host name | Verify the IP address of the virtual appliance. |
| Credential | Enter the username and password for the SnapCenter VMware plug-in that was provided during the deployment |

5. Click **Submit**.

   When the VM host is successfully added, it is displayed on the Managed Hosts tab.

6. In the left navigation pane, click **Settings**, then click the **Credential** tab, and then click **Add** to add credentials for the virtual appliance.
7. Provide the credential information that was specified during the deployment of SnapCenter Plug-in for VMware vSphere.

**NOTE**: You must select **Linux** for the Authentication field.

### After you finish

If the SnapCenter Plug-in for VMware vSphere credentials are modified, you must update the registration in SnapCenter Server using the SnapCenter Managed Hosts page.

# Logging in to the SnapCenter vSphere web client

When SnapCenter Plug-in for VMware vSphere is deployed, it installs a SnapCenter vSphere web client on vCenter, which is displayed on the vCenter screen with other vSphere web clients.

### Before you begin

Transport Layer Security (TLS) must be enabled in vCenter. Refer to the VMware documentation.

### Steps

1. In your browser, navigate to VMware vSphere vCenter.
2. On the VMware screen, click **vSphere Web Client (Flex)** or **vSphere Client (HTML5)**.
3. Log in to the **VMware vCenter Single Sign-On** page.

   **IMPORTANT**: Click the **Login** button. Due to a known VMware issue, do not use the ENTER key to log in. For details, see the VMware documentation on ESXi Embedded Host Client issues.

4. On the **VMware vSphere Web Client** page, click  (Flex home) or **Menu** (HTML5) in the toolbar, and then select **SnapCenter Plug-in for VMware vSphere**.

# Overview of the different SnapCenter GUIs

The SnapCenter Plug-in for VMware vSphere is a standalone plug-in that is different from other SnapCenter plug-ins. You must use the web client GUI in vCenter for all backup and restore operations for VMs, VMDKs, and datastores. You also use the web client GUI Dashboard to monitor the list of protected and unprotected VMs. For all other SnapCenter plug-ins (application-based plug-ins), you use the SnapCenter GUI for backup and restore operations and job monitoring.

**NOTE**: The SnapCenter VMware plug-in supports the Flex and HTML5 vSphere web clients. It does not support vCenter thick clients.

To protect VMs and datastores, you use the SnapCenter vSphere web client interface. The web client GUI integrates with NetApp Snapshot copy technology on the storage system. This enables you to back up VMs and datastores in seconds and restore VMs without taking an ESXi host offline.

There is also a management GUI to perform administrative operations on the SnapCenter VMware plug-in.

| Use this GUI… | To perform these operations... | And to access these backups... |
|---|---|---|
| SnapCenter vSphere web client GUI | VM and datastore backup<br>VMDK attach and detach<br>Datastore mount and unmount<br>VM and VMDK restore<br>Guest file and folder restore | Backups of VMs and datastores that were performed by using the SnapCenter vSphere web client GUI. |
| SnapCenter GUI | Backup and restore of databases and applications on VMs, including<br>protecting databases for Microsoft SQL Server, Microsoft Exchange, SAP HANA, and Oracle.<br>Database clone | Backups performed by using the SnapCenter GUI. |
| SnapCenter Plug-in for VMware vSphere management GUI | Modify the plug-in configuration<br>Disable/enable the plug-in | N.A. |
| vCenter GUI | Add SnapCenter SCV roles to vCenter Active Directory users<br>Add resource access to users or groups | N.A. |

**NOTE**: For VM consistent backup and restore operations, you must use the SnapCenter vSphere web client GUI. Although it is possible to perform some operations using VMware tools, for example, mounting or renaming a datastore, those operations will not be registered in the SnapCenter repository and, therefore, are not recognized.

**NOTE**: SnapCenter does not support single Snapshot copies of databases and VMs together. Backups for VMs and databases must be scheduled and run independently, which creates separate Snapshot copies, even if the databases and VMs are hosted in the same volume. Application backups must be scheduled by using the SnapCenter GUI; VM and datastore backups must be scheduled by using the SnapCenter vSphere web client GUI.

# Restarting the SnapCenter vSphere web client service

If the SnapCenter vSphere web client starts to behave incorrectly, you might need to clear the browser cache. If the problem persists, then restart the web client service.

## Restarting the SnapCenter vSphere web client service in a Linux vCenter

If your vCenter is on a Linux appliance, then you must use Linux commands to restart the SnapCenter vSphere web client service.

### Before you begin

You must be running vCenter 6.5 or later.

### Steps

1. If you are running vCenter 6.5 or later, Flex or HTML5, perform the following:
   a) Use SSH to log in to the vCenter Server Appliance as root.
   b) Access the Appliance Shell or BASH Shell by using the following command:
      `shell`
   c) Stop the web client service by using the following command:

| Client | Command |
|---|---|
| Flex | `service-control --stop vsphere-client` |
| HTML5 | `service-control --stop vsphere-ui` |

   d) Delete all stale scvm packages on vCenter by using the following command:

| Client | Command |
|---|---|
| Flex | `etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/`<br>`rm -rf com.netapp.scvm.webclient-<version_number>` |
| HTML5 | `etc/vmware/vsphere-ui/vc-packages/vsphere-client-serenity/`<br>`rm -rf com.netapp.scvm.webclient-<version_number>` |

**IMPORTANT**: Do not remove the VASA or VSC7.x and later packages.

   e) Start the web client service by using the following command:

| Client | Command |
|---|---|
| Flex | `service-control --start vsphere-client` |
| HTML5 | `service-control --start vsphere-ui` |

2. If you are running vCenter 6.0 update 3 Flex (HTML5 is not supported), perform the following:
   a) Use SSH to log in to the vCenter Server Appliance as root.
   b) Access the Appliance Shell or BASH Shell by using the following command:
      `shell`
   c) Navigate to the directory by using the following command:
      `cd /bin`
   d) Stop the web client service by using the following command:
      `service-control --stop vsphere-client`
   e) Delete all stale scvm packages on vCenter by using the following command:

```
etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/
rm -rf com.netapp.scvm.webclient-<version_number>
```

f) Start the web client service by using the following command:

```
service-control --start vsphere-client
```

## Restarting the SnapCenter vSphere web client service in a Windows vCenter

If your vCenter is on a Windows host, then you must use Windows commands to restart the SnapCenter web client service.

### Before you begin

You must be running vCenter 6.5 or later.

### Steps

1. If you are running vCenter 6.5 or later, perform the following:
   a) Stop the web client service by using the following command:

| Client | Command |
|---|---|
| Flex | `service-control --stop vsphere-client` |
| HTML5 | `service-control --stop vsphere-ui` |

   Wait for the message `Completed Stop service request.`

   b) Delete all stale `scvm` packages on vCenter by performing the following:
      i. Navigate to the vCenter `vsphere-client-serenity/` folder.

| Client | Location of folder |
|---|---|
| Flex | `C:\ProgramData\VMware\vCenterServer\cfg\vsphere-client\vc-packages\vsphere-client-serenity\` |
| HTML5 | `C:\ProgramData\VMware\vCenterServer\cfg\vsphere-ui\vc-packages\vsphere-client-serenity\` |

      ii. Delete all plug-in folders with the following name: `com.netapp.scvm.webclient-<version_number>.`

   c) Restart the web client service by using the following command:

| Client | Command |
|---|---|
| Flex | `service-control --start vsphere-client` |
| HTML5 | `service-control --start vsphere-ui` |

   Wait for the message `Completed Start service request.`

2. If you are running vCenter 6.0 update 3 or later, perform the following:
   a) Open Server Manager on the Windows system on which vCenter Server is running.
   b) Click **Configuration** > **Services**.
   c) Select **VMware vSphere Web Client** and click **Stop**.
   d) Delete all stale packages on vCenter by performing the following:
      i. Navigate to the vCenter `vsphere-client-serenity/` folder.

| Client | Location of folder |
|---|---|
| Flex | vCenter Server Appliance:<br>`etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/`<br>vCenter Server for Windows:<br>`C:\ProgramData\VMware\vCenterServer\cfg\vsphere-client\vc-packages\vsphere-client-serenity\`<br>Mac OS:<br>`/var/lib/vmware/vsphere-client/vsphere-client/vc-packages/vsphere-client-serenity/` |

| | |
|---|---|
| HTML5 | vCenter Server Appliance:<br>`etc/vmware/vsphere-ui/vc-packages/vsphere-client-serenity/`<br>vCenter Server for Windows:<br>`C:\ProgramData\VMware\vCenterServer\cfg\vsphere-ui\vc-packages\vsphere-client-serenity\`<br>Mac OS:<br>`/var/lib/vmware/vsphere-ui/vsphere-client/vc-packages/vsphere-client-serenity/` |

ii. Delete all plug-in folders with the following name: `com.netapp.scvm.webclient-<version_number>`.

e) Select **VMware vSphere Web Client** and click **Start**.

# Upgrading

## Supported upgrade paths

See the SnapCenter Plug-in for VMware vSphere Release Notes for information on supported upgrade and migration paths.

## Upgrading SnapCenter Plug-in for VMware vSphere from Windows-based to Linux-based

If you are using the Windows-based SnapCenter VMware plug-in and want to use the new features provided by the SnapCenter Plug-in for VMware vSphere virtual appliance, you must upgrade.

### Before you begin

If your backups of virtualized databases and filesystems are integrated with SnapCenter:

- If the SnapCenter server is a VM, then it is a best practice to take a VMware-based snapshot before upgrading.
- Make sure the SnapCenter server is upgraded. See the *SnapCenter Plug-in for VMware vSphere Release Notes* for information on supported upgrade paths.

### About this task

There are three basic upgrade steps:

1. Download the upgrade `.iso` file.
2. Suspend backup jobs for the Windows-based SnapCenter VMware plug-in.
3. Deploy the SnapCenter Plug-in for VMware vSphere OVA.
4. Migrate the Windows-based VMware backup metadata.

### Steps

1. Download the upgrade `.iso` file.
    a. Log in to the NetApp Support Site (https://mysupport.netapp.com/products/index.html).
    b. From the list of products, select **SnapCenter Plug-in for VMware vSphere**, then click the **DOWNLOAD LATEST RELEASE** button.
    c. Download the SnapCenter Plug-in for VMware vSphere upgrade `.iso` file to any VM.
2. Suspend backup jobs.

    In the SnapCenter GUI, suspend all jobs for the Windows-based SnapCenter Plug-in for VMware vSphere.
3. Deploy the SnapCenter Plug-in for VMware vSphere OVA

    Because this is a new installation of the Linux-based SnapCenter VMware plug-in, follow the steps for deploying the OVA.

    Deploying SnapCenter Plug-in for VMware vSphere

    Post deployment issues and required operations
4. Migrate the Windows-based VMware backup metadata.

    See the migration section in the Data Protection Guide for SnapCenter Plug-in for VMware vSphere.

## Upgrading from NetApp Data Broker to SnapCenter Plug-in for VMware vSphere

If you want to use the new features provided by SnapCenter Plug-in for VMware vSphere, you must upgrade from NetApp Data Broker 1.0.x to SnapCenter Plug-in for VMware vSphere.

### Before you begin

- The VM that you want to upgrade must have 12GB of RAM available.
- The VM that you want to upgrade must be powered on.
- A best practice is to back up the VM that contains NetApp Data Broker before the upgrade.

### About this task

There are three basic upgrade steps:

1. Prepare for the upgrade.
2. Download the upgrade `.iso` file.
3. Install the upgrade.
    a. Upload the `.iso` file to a datastore.
    b. Connect the VM to the `.iso` file in the datastore.
    c. Run the upgrade.

### Steps

1. Prepare for the upgrade by disabling SnapCenter Plug-in for VMware vSphere.
    a. Log in to the NetApp Data Broker management GUI.

    The IP is displayed when you deploy NetApp Data Broker.

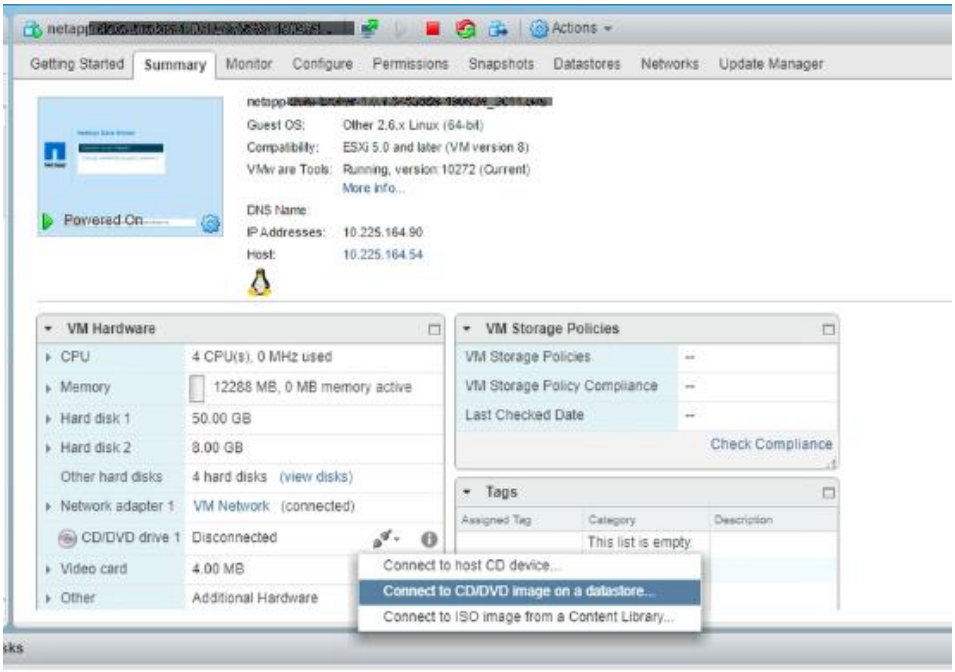
    b. Click Configuration in the left navigation pane, and then click the Service option in the **Plug-in Details** section to disable the plug-in.
5. Download the upgrade `.iso` file.
    a. Log in to the NetApp Support Site (https://mysupport.netapp.com/products/index.html).
    b. From the list of products, select **SnapCenter Plug-in for VMware vSphere**, then click the **DOWNLOAD LATEST RELEASE** button.
    c. Download the SnapCenter Plug-in for VMware vSphere upgrade `.iso` file to any location.
6. Install the upgrade.
    a. In your browser, navigate to the VMware vSphere vCenter.
    b. On the vCenter GUI, click **vSphere Web Client (Flex)**.
    c. Log in to the **VMware vCenter Single Sign-On** page.
    d. On the Navigator pane, click the NetApp Data Broker VM that you want to upgrade and then click the **Summary** tab.
    e. On the **Related Objects** pane, click on any datastore in the list and then click the **Summary** tab.
    f. On the **Files** tab for the selected datastore, click on any folder in the list, and then click the storage icon (**Upload a file to the Datastore**).
    g. On the upgrade pop-up screen, navigate to the location where you downloaded the `.iso` file, then click on the `.iso` file image, and then click **Open**.

The file is uploaded to the datastore.

h. Navigate back to the NetApp Data Broker VM that you want to upgrade, and click the **Summary** tab.

In the **VM Hardware** pane, in the CD/DVD field, the value should be “Disconnected”.

i. Click the connection icon in the CD/DVD field and select **Connect to CD/DVD image on a datastore**.




j. In the wizard, do the following:

   i. In the Datastores column, select the datastore where you uploaded the `.iso` file.

   ii. In the Contents column, navigate to the `.iso` file you uploaded, make sure “ISO image” is selected in the File Type field, and then click **OK**.

   Wait until the field shows the “Connected” status.

k. Log onto the Maintenance console by accessing the **Summary** tab of the virtual appliance and then click  to start the maintenance console.

l. Enter **2** for System Configuration, then enter **8** for Upgrade.

m. Enter **y** to continue and start the upgrade.

### After you finish

After the system displays the “upgrade successful” message, the system attempts to start the services.

1. Wait until the “Press ENTER to continue” message displays, and then log into the SnapCenter Plug-in for VMware vSphere management GUI.

   The IP address is the same as the former NetApp Data Broker address.

2. In the **Plug-in Details** section, enable the SnapCenter Plug-in for VMware vSphere service and make sure the Status shows as “Connected”.

### Information not displayed after upgrading to a new patch of the same release

After upgrading SnapCenter Plug-in for VMware vSphere to a new patch of the same release, recent jobs or other information might not be displayed in the Dashboard and job monitor.

Before upgrading to a new patch of the same release, you must clear the SnapCenter Plug-in for VMware vSphere cache on the vCenter Web Server and restart the server before the upgrade or registration.

If the plug-in cache is not cleared, then recent jobs are not displayed in the Dashboard and job monitor in the following scenarios:

- SnapCenter Plug-in for VMware vSphere was deployed using vCenter, and then later upgraded to a patch in the same release.
- The SnapCenter VMware virtual appliance was deployed in vCenter 1. Later, this SnapCenter VMware plug-in was registered to a new vCenter2. A new instance of the SnapCenter VMware plug-in is created with a patch and registered to vCenter1. However, because vCenter1 still has the cached plug-in from the first SnapCenter VMware plug-in without the patch, the cache needs to be cleared.

The cache is in the following locations, based on the type of server operating system:

- vCenter Server for Windows

  `C:\ProgramData\VMware\vCenterServer\cfg\vsphere-client\vc-packages\vsphere-client-serenity\`

- vCenter Server Linux Appliance

  `/etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/`

- Windows OS

  `%PROGRAMFILES%/VMware/vSphere Web Client/vc-packages/vsphere-client-serenity/`

- Mac OS

  `/var/lib/vmware/vsphere-client/vsphere-client/vc-packages/vsphere-client-serenity/`

#### Workaround before upgrading

1. Locate the `vsphere-client-serenity` folder, then locate the `com.netapp.scvm.webclient-4.2.0` folder and delete it.

   **NOTE**: The folder name changes for each release.

2. Restart the vCenter Server.

   You can then upgrade the SnapCenter VMware plug-in.

#### Workaround if you already upgraded before clearing the cache

1. Log in to the SnapCenter VMware plug-in management GUI.

   The IP is displayed when you deploy the SnapCenter VMware plug-in.

2. Click **Configuration** in the left navigation pane, and then click the Service option in the **Plug-in Details** section to disable the plug-in.

   The SnapCenter VMware plug-in service is disabled, and the extension is unregistered in vCenter.

3. Locate the `vsphere-client-serenity` folder, then locate the `com.netapp.scvm.webclient-4.2.0` folder and delete it.

   **NOTE**: The folder name changes for each release.

4. Restart the vCenter Server.

   You can then upgrade the SnapCenter VMware plug-in.

3. Log in to SnapCenter vSphere web client.
4. Click **Configuration** in the left navigation pane, and then click the Service option in the **Plug-in Details** section to enable the plug-in.

   The SnapCenter VMware plug-in service is enabled, and the extension is registered in vCenter.

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