



# Managing Storage Replication Adapter

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## Storage Replication Adapter Overview

Storage Replication Adapter (SRA) for VMware vCenter Site Recovery Manager (SRM) is a storage vendor-specific plug-in for VMware vCenter server. The adapter enables communication between SRM and a storage controller at the Storage Virtual Machine (SVM) level as well as at the cluster level configuration. The adapter interacts with Cisco HyperFlex to discover replicated datastores.

SRA provides the replicated datastores the ability to perform test recovery and recovery that includes planned migration and disaster recovery.



**Note** This chapter covers the instructions to be executed in SRM Release 6.5. If you are using SRM Release 6.0 or SRM Release 8.1, refer the following guides:

- For SRM 8.1 installation—<https://docs.vmware.com/en/Site-Recovery-Manager/8.1/srm-install-config-8-1.pdf>
- For SRM 8.1 configuration—<https://docs.vmware.com/en/Site-Recovery-Manager/8.1/srm-admin-8-1.pdf>

## Configuring Storage Replication Adapter

### System Requirements

Minimum requirements for SRM are:

Element	Minimum Supported Requirement
Processor	At least two 2.0 GHz or higher Intel or AMD x86 processors.

Element	Minimum Supported Requirement
Memory	4 GB
Disk Storage	5 GB
Networking	1 GB is recommended for communication between SRM protected and recovery sites

For information on supported platforms and databases, see the VMware Compatibility Matrices for your release:

[Compatibility Matrices for VMware Site Recovery Manager 8.1](#)

[Compatibility Matrices for VMware Site Recovery Manager 8.2](#)

[Compatibility Matrices for VMware Site Recovery Manager 8.3](#)

## SRA Compatibility Matrix

The following tables map Windows and Photon OS based SRA support.

### Certification Matrix for Photon OS Based SRAs

HyperFlex Versions	SRM Version					
	6.5	8.1	8.2	8.3	8.4	8.5
4.0(1a) (SRA 1.0.0)	N/A	N/A	Certified	Certified	Certified	N/A
4.0(2a) (SRA 1.1.0)	N/A	N/A	Certified	Certified	Certified	Not Certified
4.0(2b) (SRA 1.1.0)	N/A	N/A	Certified	Certified	Certified	Not Certified
4.0(2c) (SRA 1.1.0)	N/A	N/A	Certified	Certified	Certified	Not Certified
4.0(2d) (SRA 1.1.0)	N/A	N/A	Certified	Certified	Certified	Not Certified
4.0(2e) (SRA 1.1.0)	N/A	N/A	Certified	Certified	Certified	Not Certified
4.0(2f) (SRA 1.1.0)	N/A	N/A	Certified	Certified	Certified	Not Certified

Table 1: Certification Matrix for Windows OS Based SRAs

HyperFlex Versions	SRM Version					
	6.5	8.1	8.2	8.3	8.4	8.5
4.0(1a) (SRA 1.0.0)	Certified	Certified	Certified	N/A	N/A	N/A
4.0(2a) (SRA 1.1.0)	Certified	Certified	Certified	Certified	N/A	N/A
4.0(2b) (SRA 1.1.0)	Certified	Certified	Certified	Certified	N/A	N/A

4.0(2c) (SRA 1.1.0)	Certified	Certified	Certified	Certified	N/A	N/A
4.0(2d) (SRA 1.1.0)	Certified	Certified	Certified	Certified	N/A	N/A
4.0(2e) (SRA 1.1.0)	Certified	Certified	Certified	Certified	N/A	N/A
4.0(2f) (SRA 1.1.0)	Certified	Certified	Certified	Certified	N/A	N/A

## Windows Site Recovery Manager

### Installing a Site Recovery Manager for Windows

You must install an SRM server instance at the protected site and also at the recovery site. For more information on the installation procedure, refer the *Installing Site Recovery Manager* chapter in the [Site Recovery Manager Installation and Configuration](#) guide.

After you install SRM, it remains in evaluation mode until you install an SRM license key. After the evaluation license expires, existing protection groups remain protected and you can recover them, but you cannot create new protection groups or add virtual machines to an existing protection group until you obtain and assign a valid SRM license key. You must obtain and assign SRM license keys after installing SRM. For more information on the licensing, refer the *Site Recovery Manager Licensing* section in the [Site Recovery Manager Installation and Configuration](#) guide.

### Installing a Storage Replication Adapter for Windows

#### Before you begin

- Ensure that SRM and JDK 8 or above version are installed on Windows machines at the protected and recovery sites.
- Ensure that, you have obtained and assigned a valid SRM license key. For more information on the licensing, refer the *Site Recovery Manager Licensing* section in the [Site Recovery Manager Installation and Configuration](#) guide.

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**Step 1** Download SRA from the VMware site.

In the <https://my.vmware.com/web/vmware/downloads> page, locate **VMware Site Recovery Manager** and click **Download Product**. Click **Drivers & Tools**, expand **Storage Replication Adapters**, and click **Go to Downloads**.

**Step 2** Copy the Windows installer of SRA to SRM Windows machines at the protected and recovery sites.

**Step 3** Double-click the installer.

**Step 4** Click **Next** on the welcome page of the installer.

**Step 5** Accept the EULA and click **Next**.

**Step 6** Click **Finish**.

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The SRA is installed within the SRM program folder:

```
C:\Program Files\VMware\VMware vCenter Site Recovery Manager\storage\sra
```

# Site Recovery Manager Virtual Appliance

## Deploy the Site Recovery Manager Virtual Appliance

The Site Recovery Manager Virtual Appliance is a preconfigured virtual machine that is optimized for running Site Recovery Manager and its associated services. You deploy the appliance on an ESXi host in your vSphere environment. refer the Deploy the Site Recovery Manager Virtual Appliance chapter in the <https://docs.vmware.com/en/Site-Recovery-Manager/8.2/srm-install-config-8-2.pdf>

After you install SRM, it remains in evaluation mode until you install an SRM license key. After the evaluation license expires, existing protection groups remain protected and you can recover them, but you cannot create new protection groups or add virtual machines to an existing protection group until you obtain and assign a valid SRM license key. You must obtain and assign SRM license keys after installing SRM. For more information on the licensing, refer the Site Recovery Manager Licensing section in <https://docs.vmware.com/en/Site-Recovery-Manager/8.2/srm-install-config-8-2.pdf>

## Installing a Photon OS Storage Replication Adapter

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- Step 1** Download SRA from the VMware site.  
In the <https://my.vmware.com/web/vmware/downloads> page, locate **VMware Site Recovery Manager** and click **Download Product**.
- Step 2** Download Drivers and Tools from the VMware site.  
Click **Drivers & Tools**, expand **Storage Replication Adapters**, and click **Go to Downloads**.
- Step 3** Log in to the Site Recovery Manager Appliance Management Interface as admin.  
Click on **Storage Replication Adapter** tab.
- Step 4** Click **NEW ADAPTOR** button and upload the SRA.
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## Setting up SRM Environment

This section covers the following procedures:

- [Pairing Sites, on page 5](#)
- [Configuring Mapping, on page 5](#)
- [Refreshing Storage Replication Adapter, on page 6](#)
- [Adding an Array Manager Pair, on page 6](#)
- [Mapping Datastores on Cisco HyperFlex, on page 7](#)
- [Discovering Devices, on page 7](#)
- [Creating a Protection Group, on page 8](#)
- [Creating a Recovery Plan, on page 8](#)

## Pairing Sites

Before you can use SRM, you must connect the SRM server instances on the protected and recovery sites. This is known as site pairing.

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- Step 1** Log in to your protected site vCenter server using vSphere Web Client.
- Step 2** In the home page, click **Site Recovery** plug-in and select sites.
- Step 3** Enter the platform service controller address of the SRM remote site (recovery site). Leave the port number as default if you don't have any custom port for platform services controller (PSC). Click **Next**.
- The system displays the vCenter server instance in which SRM server is registered on the remote site.
- Step 4** Enter the vCenter server single sign-on (SSO) credentials and click **Finish**.
- The connection process proceeds automatically after authentication with the correct privileges established.
- For more information, refer the *Site Recovery Manager Licensing* section in the [Site Recovery Manager Installation and Configuration Guide](#).
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When the site pairing is established between protected and recovery site, you will be able to see the remote site under **Sites** in the SRM interface. It displays the information about the primary site and paired site.

## Configuring Mapping

Mappings allow you to specify how SRM maps virtual machine resources on the protected site to resources on the recovery site. During recovery, when virtual machines start on the recovery site, the virtual machines use the resources on the recovery site that you specify in the mappings.

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- Step 1** Log in to the protected site vCenter using vSphere Web Client.
- Step 2** Click **SRM** plugin. Select the protected site and click **Configure Inventory Mappings**.
- Step 3** Click the following options and do the respective mappings:

Option	Action
Create resource mappings	Map resource pools, standalone hosts, vApps, or clusters on the protected site to resource pools, standalone hosts, vApps, or clusters on the recovery site. You can map any type of resource on one site to any type of resource on the other site.  <b>Note</b> You cannot map individual hosts that are part of clusters to other resource objects.
Create folder mappings	Map datacenters or virtual machine folders on the protected site to datacenters or virtual machine folders on the recovery site.
Create network mappings	Map networks on the protected site to networks on the recovery site.

Option	Action
Configure placeholder datastores	Select the datastore from the list to be used as placeholder datastore for the production cluster.  <b>Important</b> You have to configure placeholder datastores on recovery site as well.

For more information on inventory mappings, refer [VMware Site Recovery Manager Administration Guide](#)

## Refreshing Storage Replication Adapter

- Step 1** Log in to vSphere Web Client.
- Step 2** In the home page, click the **Site Recovery** plugin.
- Step 3** Click **Sites** and select the protected site.
- Step 4** Click the **Monitor** tab.
- Step 5** Click **Refresh**.

The Refresh icon is available next to **Add Array Manager**.

Execute the same procedure for the recovery site to refresh SRA in the recovery site.

### What to do next

After refresh, the status of the site is set to **OK** with a green tick. This action refreshes SRA information, allowing SRM to discover the SRAs.

## Adding an Array Manager Pair

- Step 1** Log in to vSphere Web Client.
- Step 2** Click **SRM** plugin. Select the protected site and click **Array Based Replication**.
- Step 3** Click **Add (+)**.  
The **Add Array Manager** wizard appears.
- Step 4** In the **Add Array Manager** wizard, do the following:
  - a) Click **Add a pair of array managers** to add array managers for both the protected and recovery sites at one shot. You will be prompted to add two array managers, one for each site. Click **Next**.
  - b) Select the pair of sites (the protected site and recovery site). Verify the displayed site information and click **Next**.  
The system automatically detects the type of SRAs installed on both the sites and statuses of SRAs.
  - c) Click **Next**.
  - d) Enter the display name, IP address, and credentials for the protected site array manager. Click **Next**.
  - e) Enter the display name, IP address, and credentials for the recovery site array manager. Click **Next**.

- f) Check to enable the array pairs and click **Next**.
- g) Review the specified information for array manager and click **Finish**.

## Mapping Datastores on Cisco HyperFlex

### Before you begin

Ensure that a replication pair is created from protected cluster to recovery cluster.



**Note** If the datastore is the target of replication, it is safe to ignore any “Datastore unmounted” alerts.



**Note** Datastores with same encryption property can be mapped.

**Step 1** Log in to HX Connect as an administrator.

**Step 2** Select **Replication > Replication Pairs**.

**Step 3** Select the replication pair of protected and recovery sites, and click **Edit**.

**Step 4** Click the **Other DRO Protection** tab and do the following:

- a) The **Local Datastore** column displays a list of the unpaired configured datastores on the local HX cluster. Map one local datastore to one remote datastore.
- b) From the **Remote Datastore** pull-down menu, choose a datastore that need to be paired with the local datastore.
- c) From the **Direction** pull-down menu, choose **Incoming** or **Outgoing** as the direction of VM movement for the mapped datastores.
- d) From the **Protection Schedule** pull-down menu, choose the schedule for protecting all the VMs in the datastore.
- e) Click **Map Datastores**.

**Step 5** Click **Map Datastores**.

## Discovering Devices

**Step 1** Log in to vSphere Web Client.

**Step 2** In the home page, click **Site Recovery** plugin.

**Step 3** Expand **Inventories** and click **Array Based Replication**.

**Step 4** Select the protected array.

**Step 5** Click **Manage**.

**Step 6** Click blue refresh icon.

This actions runs the discover devices on the selected array pair.

## Creating a Protection Group

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- Step 1** Log in to vSphere Web Client.
- Step 2** In the home page, click **Site Recovery** plugin.
- Step 3** Expand **Inventories** and click **Protection Groups**.
- Step 4** Click **Objects**.
- Step 5** Click **Create Protection Group**.
- Step 6** Enter the name and location for the protection group.
- Step 7** Choose incoming or outgoing as the direction of protection.
- Step 8** Choose **Datastore groups** from the **Protected Group type** drop-down list. Click **Next**.
- Step 9** Select the datastore groups from the list to be grouped to use for the protection group.  
All the virtual machines stored on these datastore groups will be recovered together as part of the protection group.
- Step 10** Click **Next**.
- Step 11** Review all the information, which you have selected to create the SRM protection group and click **Finish**.
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## Creating a Recovery Plan

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- Step 1** In the vSphere Web Client home page, click **Site Recovery** plugin.
- Step 2** Expand **Inventories** and click **Recovery Plans**.
- Step 3** Click **Objects**.
- Step 4** Click **Create Recovery Plan**.
- Step 5** Enter the name and description for the recovery plan and select the location for the recovery plan. Click **Next**.
- Step 6** Select the recovery site in which the VMs will be recovered as part of the recovery plan. Click **Next**.
- Step 7** Select the list of protection groups which will be included as part of the recovery plan. Click **Next**.
- Step 8** Specify the test networks to use while running tests of the recovery plan.  
You can select the test networks if you have created for the test purposes or you can leave the default auto created test network called isolated network.
- Step 9** Click **Next**.
- Step 10** Review all the information, which you have selected to create the recovery plan and click **Finish**.
- 

## Executing SRA Workflows

After SRA configuration, SRM works with SRA to discover arrays and replicated and exported datastores, and to failover or test failover datastores.

SRA enables SRM to execute the following workflows:

- Discovery of replicated storage

- Non-disruptive failover test recovery using a writable copy of replicated data
- Emergency or planned failover recovery
- Reverse replication after failover as part of failback



**Note** After failover, the source datastore is unmounted on HX data platform, due to which, the datastore to VM mapping returns empty list. So, we cannot unpair the datastores. To unpair the datastore, you have to bring the VMs on the source datastore to the Active state by invoking the Reprotect operation.

This section covers the following topics:

- [Testing a Recovery Plan, on page 9](#)
- [Testing the Recovery Plan Cleanup Task, on page 10](#)
- [Executing a Recovery, on page 10](#)
- [Executing a Reprotect Task, on page 11](#)

## Testing a Recovery Plan

**Step 1** In the vSphere Web Client home page, click **Site Recovery** plugin.

**Step 2** Expand **Inventories** and click **Recovery Plans**.

**Step 3** Select the recovery plan and click **Monitor**.

**Step 4** Click the green play button to run the test recovery.

**Caution** Be cautious in selecting the test recovery option.

The recovery process runs in the test mode to recover the virtual machines in a test environment on the recovery site. You have the storage option to choose whether to replicate the recent changes to the recovery site or not. This process may take several minutes to complete the replication of recent changes to the recovery site. According to your requirement, you can choose to run the test recovery with recent changes or not.

**Step 5** Click **Next**.

**Step 6** Review the settings and click **Finish** to initiate the SRM test recovery.

The series of recovery steps involved as part of this recovery plans are displayed with its progress percentage.

**Note** Once the plan is executed, the datastore on the recovery site will be unmounted and it will stay unmounted. During this time, you can ignore alerts on the HyperFlex recovery cluster as this is expected behavior.

On completion of the test recovery, the status of the recovery plan is changed to **Test Complete** and status of each recovery steps is changed to **Success**. Also, the virtual machines that are part of the protection group as part of this recovery plan are powered on in both protected and recovery site without causing any interruption to the production virtual machines.

After successful execution of test recovery, you can run a recovery plan cleanup to return virtual machines to their initial state at which it was before running the recovery plan test. The recovery plan status is reset to

**Ready** state. You can also run a forced cleanup when you experience errors during execution of a recovery plan. For more information, see [Testing the Recovery Plan Cleanup Task, on page 10](#).

## Testing the Recovery Plan Cleanup Task

You can run a recovery plan cleanup task to return virtual machines to their initial state at which it was before running the recovery plan test. Also, you can run a forced cleanup when you experience errors during execution of a recovery plan.

### Before you begin

A recovery plan must be run.

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- Step 1** In the vSphere Web Client home page, click **Site Recovery** plugin.
  - Step 2** Expand **Inventories** and click **Recovery Plans**.
  - Step 3** Select the recovery plan and click **Monitor**.
  - Step 4** Click the brush icon to cleanup the test recovery.  
Running a cleanup operation on this plan will remove the test environment and reset the plan to ready state.
  - Step 5** Click **Next** after receiving the cleanup confirmation message.
  - Step 6** Review the clean information and click **Finish** to start the recovery test cleanup task.
- 

You can monitor the progress of the test recovery cleanup process. The recovery plan cleanup task returns virtual machines to their initial state as it was before running the recovery plan test. After cleanup, the virtual machines recovered as part of the test recovery in the recovered site are in the powered off state. The recovery plan status is reset to **Ready** state. The recovery plan is ready to test again.

## Executing a Recovery

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- Step 1** In the vSphere Web Client home page, click **Site Recovery** plugin.
  - Step 2** Expand **Inventories** and click **Recovery Plans**.
  - Step 3** Select the recovery plan and click **Monitor**.
  - Step 4** Click the red play button to run the recovery plan.
  - Step 5** Choose **Planned Migration** or **Disaster recovery** as per your requirement. Click **Next**.
  - Step 6** Review the settings set for initiating the SRM recovery and click **Finish**.  
The series of recovery steps involved in the recovery plan, are displayed with the percentage of progress.
- 

On completion of recovery process, the status of the recovery plan is set to **Recovery Complete** and the status of each recovery steps is set to **Success**. The virtual machines that are part of the protection group of the recovery plan are powered on in both the protected and recovery sites, without interrupting the production virtual machines.

## Executing a Reprotect Task

After completing the recovery, you can reprotect the recovery plan.

- 
- Step 1** In the vSphere Web Client home page, click **Site Recovery** plugin.
  - Step 2** Expand **Inventories** and click **Recovery Plans**.
  - Step 3** Select the recovery plan and click **Monitor**.
  - Step 4** Click **Reprotect**.
  - Step 5** Review the settings set for initiating the SRM reprotect and click **Finish**.
- 

The progress of each reprotect steps is displayed. On completion of reprotection, the status of the recovery plan is set to **Reprotect Successful** and the status of each reprotect steps is set to **Success**. The virtual machines are protected, and the test recovery and recovery options are enabled.



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**Note** When you execute the Reprotect task, the datastore replication direction does not change to reflect reverse replication. We recommend you to view the VM direction at **Replication > Replication Pairs > Other DRO Protection** to confirm replication direction.

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## Troubleshooting SRA

### Troubleshooting: Using Windows SRM Log Files

To identify the cause of any problems that you may encounter during the day-to-day running of SRM, you have to collect and review SRM log files. To get VMware support, you have to send the log files to them.

The VMware SRM logs from SRM server are available at: `C:\ProgramData\VMware\VMware vCenter Site Recovery Manager\Logs`

SRA specific logs are available under the SRA folder at: `C:\ProgramData\VMware\VMware vCenter Site Recovery Manager\Logs\SRAs\`

To download SRM log files from the SRM interface, follow this procedure:

1. In the vSphere Web Client home page, click **Site Recovery > Sites**.
2. Select a site for which the log file has to be collected.
3. From the **Actions** menu, select **Export SRM Log**.  
Alternatively, right-click the site and select **Export SRM Log**.
4. In the **Export SRM Log** wizard, click **Generate Log**.
5. Click **Download Log**.

## Troubleshooting: Using the SRM Appliance Log Files

To identify the cause of any problems that you may encounter during the day-to-day running of SRM, you must collect and review SRM log files. To get VMware support, you have to send the log files to them. You have to SSH to SRM Appliance to get the log file with root login

The VMware SRM logs from the SRM Appliance are available at: `/var/log/vmware/srm`

SRA specific logs are available under the SRA folder at: `/var/log/vmware/srm/SRAs`

To download SRM log files from the SRM interface, follow this procedure:

1. In the vSphere Web Client home page, click **Site Recovery** > **Sites**.
2. Select a site for which the log file has to be collected.
3. From the **Actions** menu, select **Export SRM Log**.  
Alternatively, right-click the site and select **Export SRM Log**.
4. In the **Export SRM Log** wizard, click **Generate Log**.
5. Click **Download Log**.

## Troubleshooting: Location of the VMware Virtual Center

If you delete a VM from VMware vCenter that is located on a **Other DRO** datastore pair, a recovery plan for this datastore pair fails during recovery. To avoid this failure, first unprotect the VM using the following command on one of the controller VM:

```
stcli dp vm delete --vmid <VM_ID>
```

## Troubleshooting: Name of the VM

If you rename a VM from the vCenter, HyperFlex recovers at the previous name folder but registers the VM with the new name on the recovery side. Following are some of the limitations to this situation:

- VMware allows a VMDK located at any location to be attached to a VM. In such cases, Hyperflex recovers the VM inside the VM folder and not at a location mapped to the original location. Also, recovery can fail if the VMDK is explicitly referenced in the `virtualmachine name.vmx` file by its path. The data is recovered accurately but there could be problems with registering the VM to vCenter. Correct this error by updating the `virtualmachine name.vmx` file name with the new path.
- If a VM is renamed and a VMDK is added subsequently, the new VMDK is created at `[sourceDs] newVm/newVm.vmdk`. Hyperflex recovers this VMDK with the earlier name. In such cases, recovery can fail if the VMDK is explicitly referenced in the `virtualmachine name.vmx` file by its path. The data is recovered accurately but there could be problems with registering the VM to the Virtual Center. Correct this error by updating the `virtualmachine name.vmx` file name with the new path.