

HP StorageWorks

HP EVA Storage Replication Adapter version 5.01.00 for VMware vCenter SRM Administrator Guide

Abstract

This document provides information about the HP EVA Storage Replication Adapter version 5.01.00 for VMware vCenter SRM, requirements and procedures for installing it, and information for configuring the software. This document is intended for system administrators with knowledge of host hardware, HP EVA disk arrays, and the VMware Site Recovery Manager (SRM).



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Acknowledgments

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1 Overview of HP EVA SRA Software version 5.01.00

HP EVA SRA Software version 5.01.00 is a Storage Replication Adapter (SRA) for use with VMware Site Recovery Manager (SRM). The SRA, developed by HP for EVA storage arrays, enables SRM to work with HP EVA Continuous Access Software array-based replication. HP EVA SRA Software version 5.01.00 is installed on VMware Site Recovery Manager (SRM) servers and enables communications between SRM and HP Command View EVA Software (and HP EVA Continuous Access Software for remote replication).

For supported disk array models and operating system versions, see the release notes for HP EVA SRA Software version 5.01.00.

For information on VMware and the VMware Site Recovery Manager, see the VMware website. <http://www.vmware.com/products/site-recovery-manager/>.

This document does not describe the operation of related products, including HP Command View EVA Software, HP EVA Continuous Access Software, HP EVA Business Copy Software, HP Storage Software Scripting Utility, or VMware Site Recovery Manager. For information about these products, see the respective user guides.

HP EVA SRA Software version 5.01.00 performs the following functions:

- Discovers disk arrays and their replication peers
- Discovers replicated LUNs
- Fails over storage for testing (test a recovery plan)
- Fails over storage for recovery

For detailed operational information on HP Command View EVA Software, HP EVA Continuous Access Software, HP EVA Business Copy Software, or VMware Site Recovery Manager see the sources cited in [Related information](#).

Discovery of disk arrays and LUNs

During SRM configuration, HP EVA SRA Software version 5.01.00 is called to discover available arrays and replicated LUNs.

The following information is discovered:

- Source and Target Storage array IDs
- Controller Port WWNs
- Configured host group information
- Existing LUN presentation of replicated devices to ESX servers
- Remote vdisk information
- Data Replication group identification and state information

Remote vdisks are members of HP EVA storage systems and HP EVA data replication groups, and are replicated between protected and recovery HP EVA storage systems and HP EVAs using HP EVA Continuous Access Software.

Disk array discovery sequence

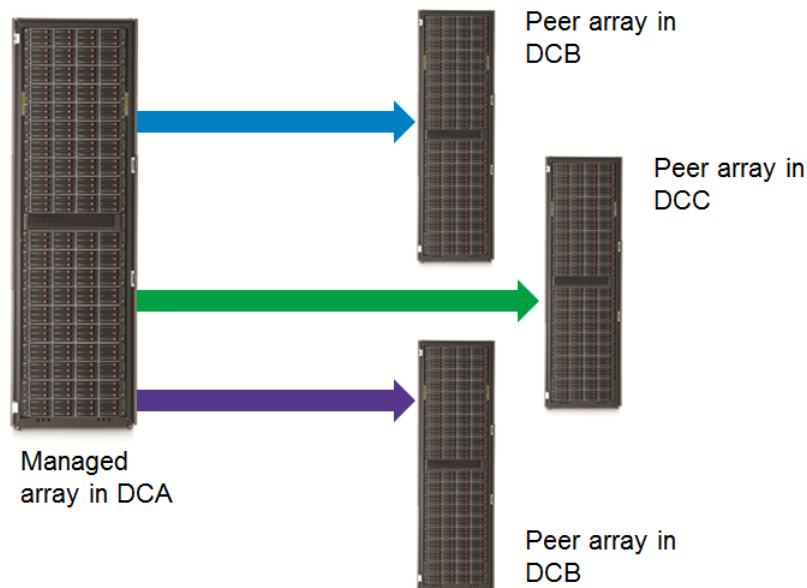
Once the array manager has been added and configured from within VMware SRM, SRM calls the adapter to discover the arrays configured for with the SRA. SRM periodically calls the SRA to refresh array information.

The array discovery sequence is:

1. SRM sends a request for available arrays to HP EVA SRA Software version 5.01.00.
2. HP EVA SRA Software version 5.01.00 connects to HP Command View EVA Software servers and requests array controller port information (WWN).
3. HP EVA SRA Software version 5.01.00 returns the results to SRM.

SRA discovers arrays configured in the Storage administrator portal, and replica peer arrays if a Data Replication Group (DR Group) is configured between them (see [Figure 1 \(page 6\)](#)).

Figure 1 Discover arrays



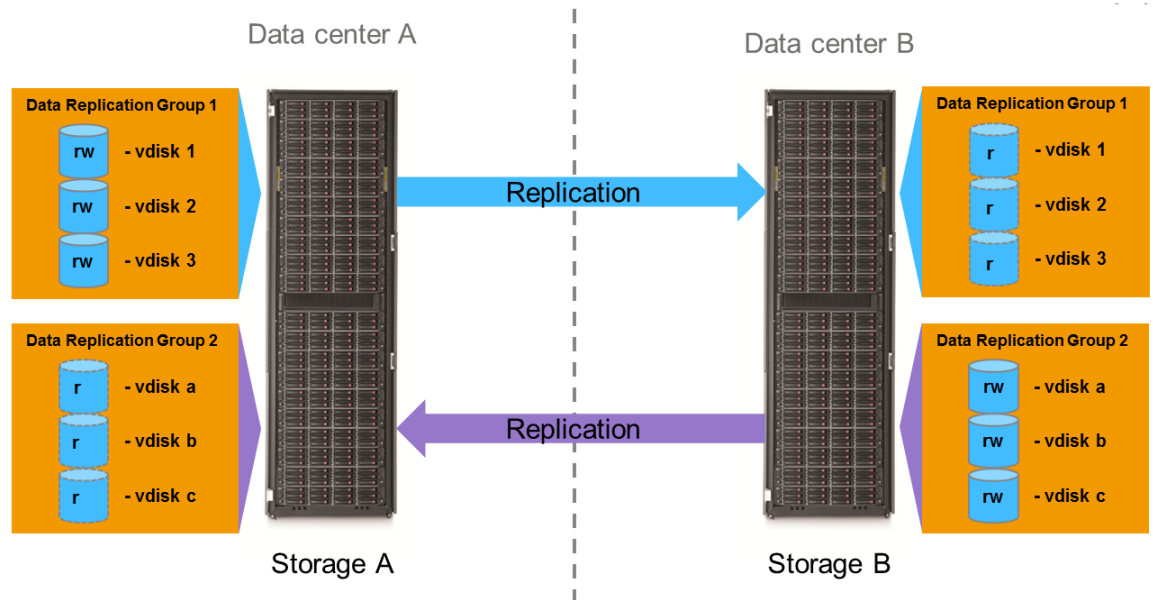
LUN discovery sequence

Once SRM has discovered the available arrays and an array pair has been enabled, SRM calls the SRA to discover all replicated devices and consistency groups between the pair and uses the information to calculate datastore groups that are to be used in protection groups.

The LUN discovery sequence is:

1. SRM sends a request for replicated LUNs on a local (protected) array to the HP EVA SRA Software version 5.01.00.
2. HP EVA SRA Software version 5.01.00 connects to HP Command View EVA Software servers and requests replicated vdisks on the protected array.
3. Data Replication Group information, including vdisk member information is discovered.
4. For each replicated vdisk found on the protected array, HP EVA SRA Software version 5.01.00 gathers the following information:
 - Remote array ID
 - Remote vdisk name
 - Local presentation information
 - Host the LUN is presented to locally
 - ID assigned to host
5. HP EVA SRA Software version 5.01.00 returns this information to SRM.
6. SRM correlates LUNs with datastores in order to determine which virtual machines can be configured for DR failover.

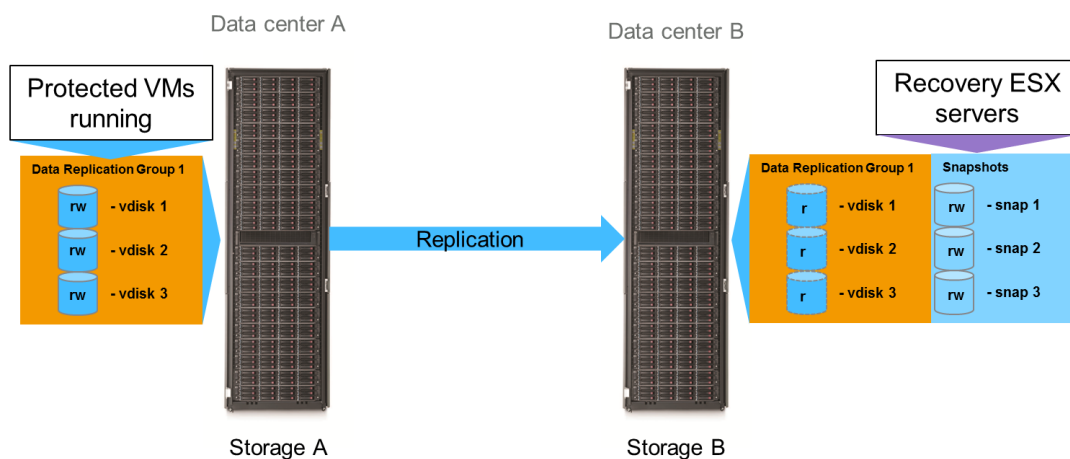
Figure 2 Discovery of replicated consistency groups/devices between an array pair



Failover testing

HP EVA SRA Software version 5.01.00 provides status information, enables replication I/O when needed, monitors synchronization status, and performs EVA operations for nondisruptive testing of SRM failover recovery plans. SRM uses the information gathered during the discovery process to create snapshots of remote vdisks. See [Figure 3 \(page 7\)](#). After testing verifies the vdisks snapshots can be recovered after failure of the local array (via a recovery plan), SRM uses HP EVA SRA Software version 5.01.00 to unrepresent and delete the snapshots. Using HP EVA Business Copy Software, HP EVA SRA Software version 5.01.00 creates snapshots during recovery plan testing.

Figure 3 Using snapshots for recovery test



Failover recovery

1. During recovery plan execution, when SRM reaches the *Prepare Storage* step, the plan provides the HP EVA SRA Software version 5.01.00 with the DR Group and LUN information needed for failover. The information includes:
 - Recovery site storage array ID
 - DR group ID
 - Vdisk name
 - Recovery ESX server HBA ports (WWNs) for post-failover LUN presentation
2. HP EVA SRA Software version 5.01.00 communicates with HP Command View EVA Software and fails over each data replication group associated with the LUN information provided by SRM.
3. HP EVA SRA Software version 5.01.00 obtains LUN presentation information for each vdisk that has failed over and returns the information to SRM. The information includes:
 - Vdisk name
 - LUN assignment to recovery HBA ports

NOTE: During initial setup, source vdisks of the DR Groups must be presented to the protected site ESX host and target vdisks must be presented to the recovery site ESX host.

If the adapter detects that replication I/O has been suspended, it attempts to resume replication and wait for resynchronization to complete before attempting failover.

For failover testing, LUN assignment is the LUN used by the *snapshot* and not the parent vdisk.

Communication path

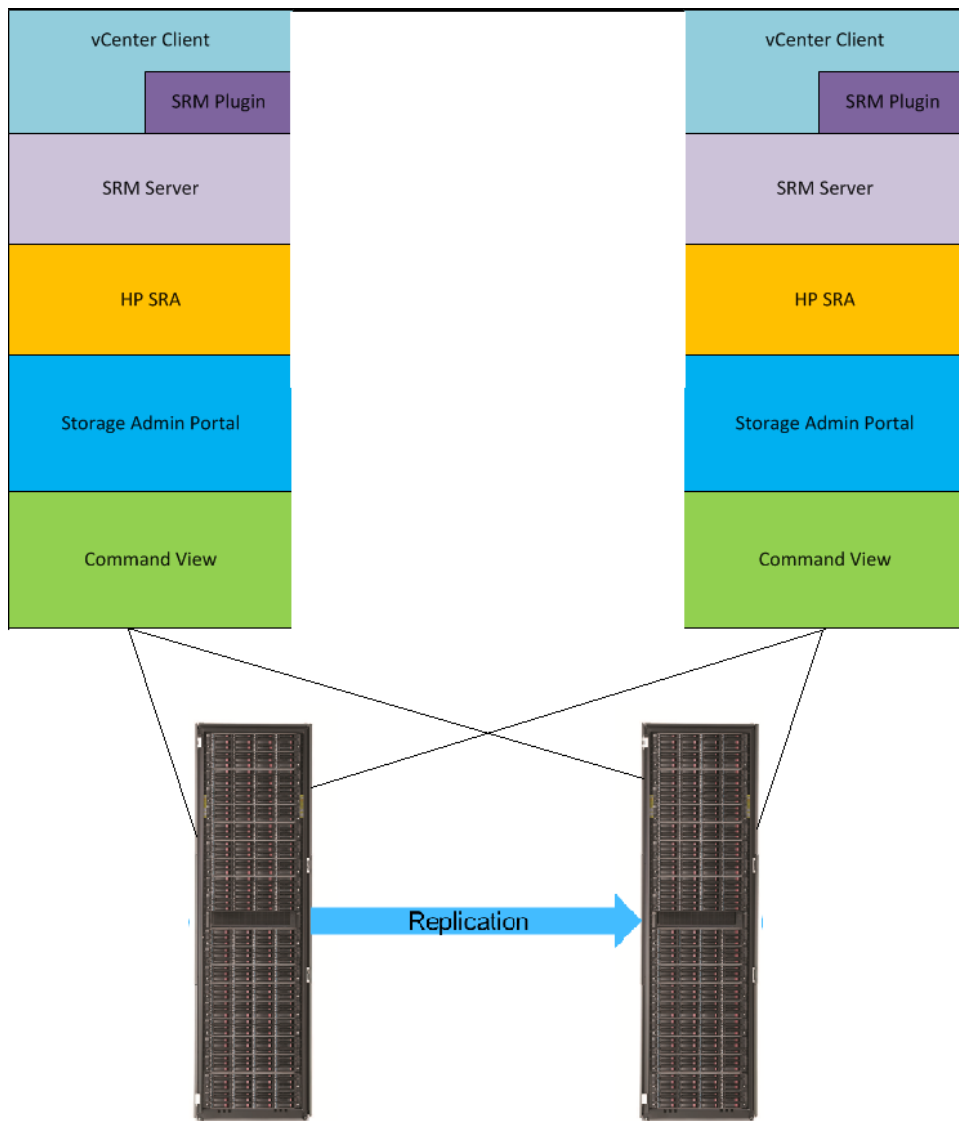
HP EVA SRA Software version 5.01.00 uses the Storage Administration Portal to communicate with HP Command View EVA Software servers in the SAN.

When Site Recovery Manager makes a request to HP EVA SRA Software version 5.01.00, the SRA communicates through the Storage Administration Portal for all operation.

Storage Administration Portal is configured on both the protected and recovery SRM server, and each instance of Storage Administration Portal is configured to communicate to respective sites of the HP Command View EVA Software servers in the SAN (see the configuration section for more information on setting up and configuring the Storage Administration Portal). Each instance of the Storage Administration Portal is configured to communicate to respective HP Command View EVA Software servers in the SAN.

In recommended configurations, where the primary site HP Command View EVA actively manages primary site arrays and recovery site HP Command View EVA actively manages recovery site arrays, the Storage Administration Portal at each site must be configured to communicate only with HP Command View EVA local to the site.

Figure 4 HP EVA SRA Software version 5.01.00 architecture



Replication options

SRM with HP EVA SRA Software version 5.01.00 supports HP EVA Continuous Access Software synchronous and asynchronous replication operations.

2 Configuring SRM, HP EVA, and HP EVA SRA Software version 5.01.00

This chapter summarizes the steps to set up SRM, HP EVA and HP EVA disk array for use with HP EVA SRA Software version 5.01.00. For detailed information on these steps, see the documents listed in [Related information](#).

Complete the following steps:

1. Set up EVA SAN environment with local and intersite link (ISL) zoning configurations.
2. Install HP EVA SRA Software version 5.01.00. For an upgrade, reboot the server if the installer prompts you to do so.
3. Configure array managers with HP Storage Administration Portal.
4. Pair SRM sites (protected/recovery).
5. Create protection groups.
6. Create recovery plans.

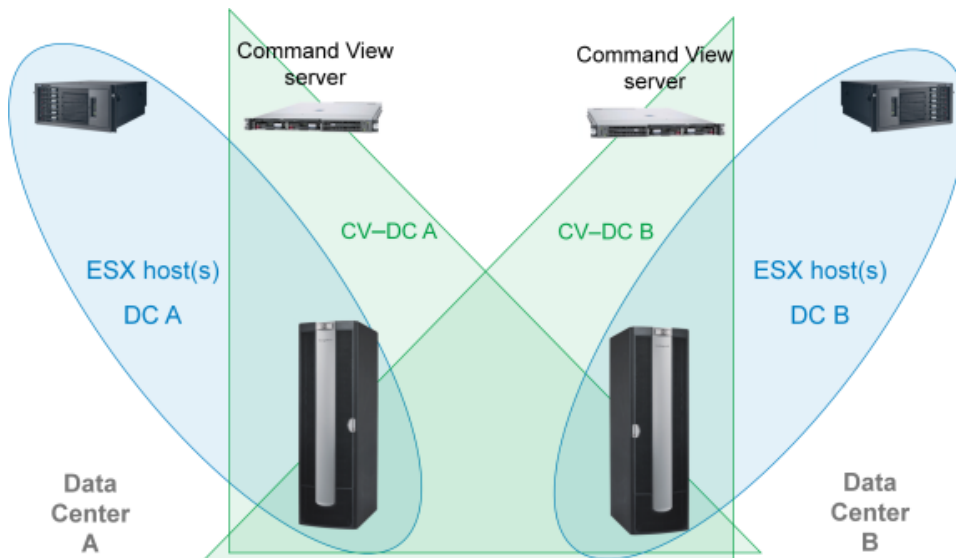
Setting up the SAN environment

Setting up the EVA SAN environment involves the following steps:

- Set up zones (local zoning and ISL zoning).

Local zoning should be configured in such a way that for each data center, local ESX server HBA ports share the same zone as host ports from the storage array. For ISL zoning, a zone is created so that host ports for both the local and remote storage array share the same zone. Note that HP Command View EVA Software servers for data center A and B need to be included in the ISL zone (see [Figure 5 \(page 10\)](#)).

Figure 5 SRM zone



- Install licenses for:
 - HP EVA Continuous Access Software (to create replication pairs and perform failover between data centers)
 - HP EVA Business Copy Software (for full feature set of SRM, for example, to create snapshots during test recovery operation from SRM)
- Create vdisks for replicated datastores and RDMs.

- Add vdisks to data replication groups on the array.
- Create datastores using VMware vCenter.

Adding an ESX server

After you configure zoning, use HP Command View EVA Software to add an ESX server to the host group that is available to the local HP EVA disk array by selecting the **Hosts** folder under the managed storage array and selecting **Add host** within the HP Command View EVA Software GUI (see [Figure 6 \(page 11\)](#)). You can assign an alias (host name) to HBA ports (initiator IDs) that can be seen by the HP EVA disk array and used for LUN presentation.

For more information on these tasks, see the *HP Command View EVA Software User Guide*.

Figure 6 Adding an ESX host to an array host group via HP Command View EVA Software

The screenshot shows the 'Add a Host' dialog in HP Command View EVA Software. The 'Basic Settings' section includes fields for Name (Recovery_ESX), Type (Fibre channel), Port WWNs (1000-0000-C99A-3DA8 and 1000-0000-C979-0549), and Operating System (VMware). The 'Advanced Settings' section includes a checkbox for 'Add to storage systems' (checked for HSV340-2660), a field for 'Host name/IP address' (10.10.10.54), and a 'Comments' field.

Installing licenses

Install the following licenses:

- HP EVA Continuous Access Software (to create replication pairs and perform failover between data centers)
- HP EVA Business Copy Software (for full feature set of SRM, for example, to create snapshots during test recovery operation from SRM) must be on the HP P6000/EVA disk arrays at the protected site and recovery site.

For more information on HP EVA Continuous Access Software and HP EVA Business Copy Software, see the documents in [Related information](#).

NOTE: Snapclones, mirrorclones, and the ability to choose different disk group for clones are not currently supported with SRM or HP EVA SRA Software version 5.01.00.

Creating vdisks for datastores

You must create HP EVA virtual disks (vdisks) for VMware ESX datastores and raw device mappings (RDM). Create the vdisks on the protected HP EVA disk array, using HP Command View EVA Software or HP Storage System Scripting Utility (SSSU) Command Line Interface.

After you create HP EVA vdisks on the local EVA, create data replication groups containing the vdisks that will be used for replicated virtual machines for use with SRM. Create DR groups on the local EVA disk array to provide vdisk failover between two HP EVA disk arrays. You can create DR groups using HP Command View EVA Software or HP SSSU.

For more information, see the *HP Command View EVA Software User Guide* and the *HP Storage Software Scripting Utility Reference*.

Presenting LUNs

After vdisks have been created and put into a data replication group, present the LUNs from the local array to all local ESX servers in the SRM environment. When you add a vdisk into a data replication group, it is replicated to the remote EVA.

After presenting the vdisks to the local ESX server, use vCenter to rescan storage devices for all ESX servers that are part of the SRM environment. There is no need to rescan for LUNs on the remote ESX servers since SRM does this during failover. You can present LUNs using HP Command View EVA Software or SSSU.

For more information, see the *HP Command View EVA Software User Guide* and the *HP Storage Software Scripting Utility Reference*.

Creating and configuring datastores

Perform the following tasks on protected ESX servers after LUN presentation.

On protected ESX servers:

- Create datastores on ESX server.
- Install virtual machines onto the datastores.
- Create resource pools and folders as needed.

For more information, see the *VMware Site Recovery Manager Administration Guide*.

Configuring array managers with HP Storage Administration Portal

After installing HP EVA SRA Software version 5.01.00 on both SRA servers (protected site and recovery site), the installed SRA component, HP EVA SRA Software version 5.01.00 Storage Admin Portal must be configured at both sites.

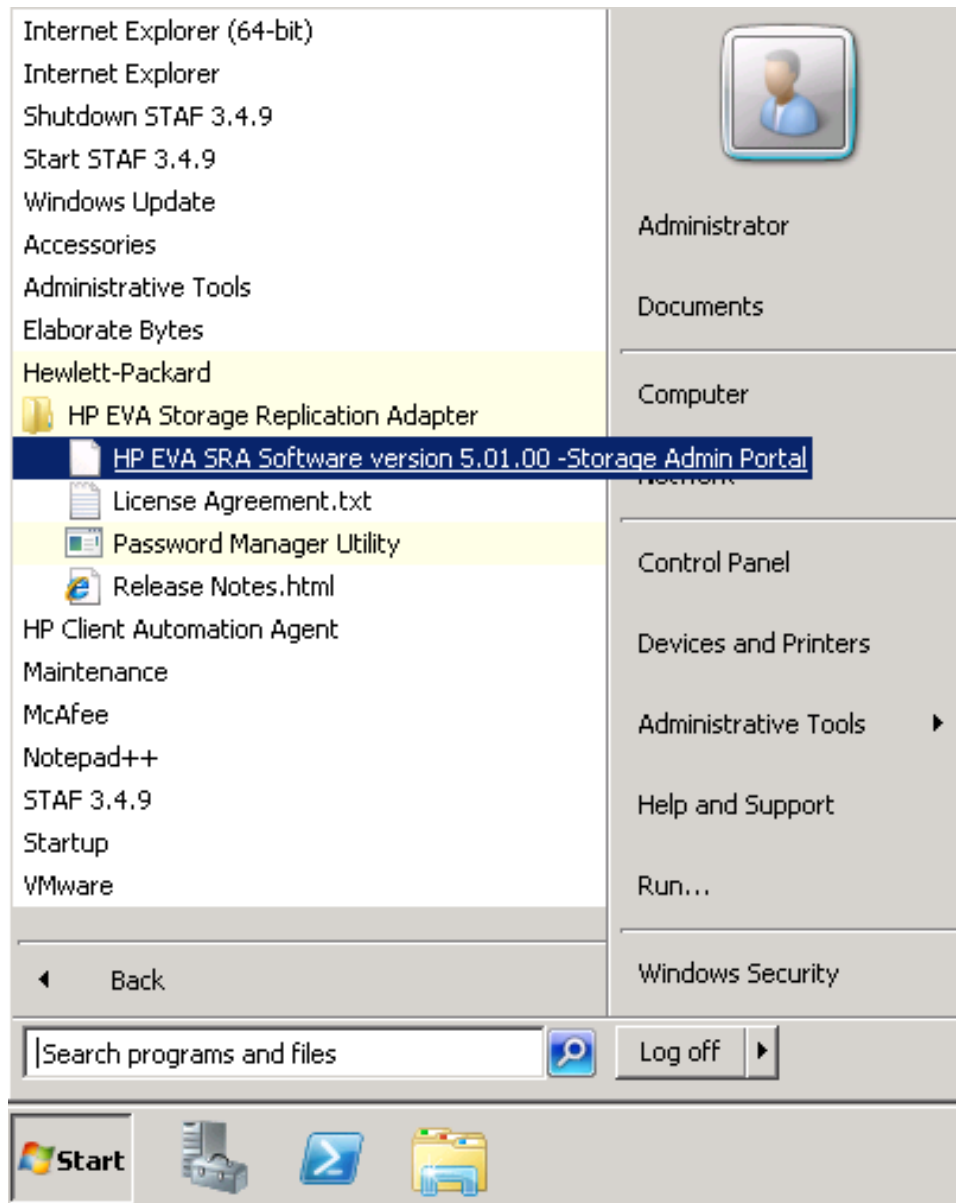
HP recommends that you configure the HP Command View EVA Software servers in such a way that the HP Command View EVA Software residing at the protected site is actively managing the storage array used at the protected site, and passively managing the storage array located in the recovery site. In turn, the HP Command View EVA Software server located at the recovery site should be set to actively manage the storage array at the recovery site, and passively manage the storage array used in the protected site.

The respective HP Command View EVA Servers located at Protected and Recovery sites should actively manage the local site EVA arrays. Even if the array management is changed across HP Command View EVA servers for DR operations, HP strongly recommends that you bring the array management to the original state (local HP Command View EVA Server actively managing the local site EVA array) before doing any SRM operations.

1. Launch Storage Admin Portal from the Windows Start menu:

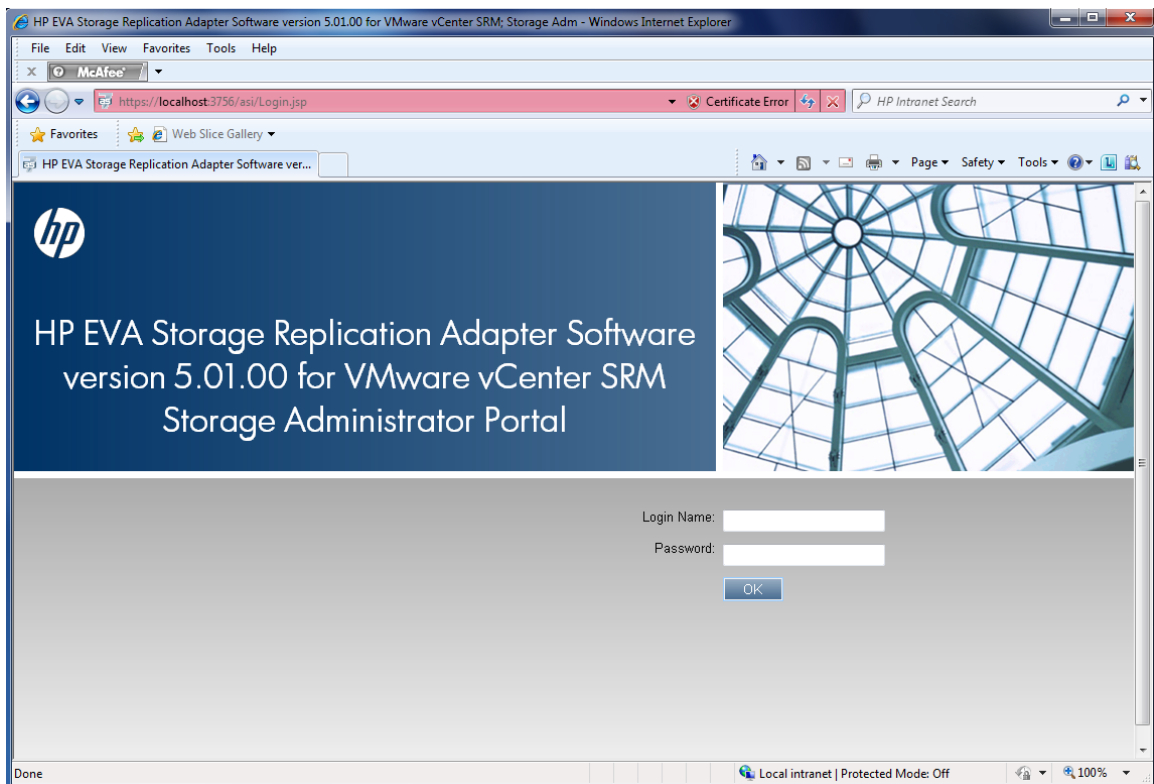
Start > All Programs > Hewlett-Packard > HP EVA Storage Replication Adapter > HP EVA SRA Software version 5.01.00 - Storage Admin Portal

Figure 7 Storage Admin Portal



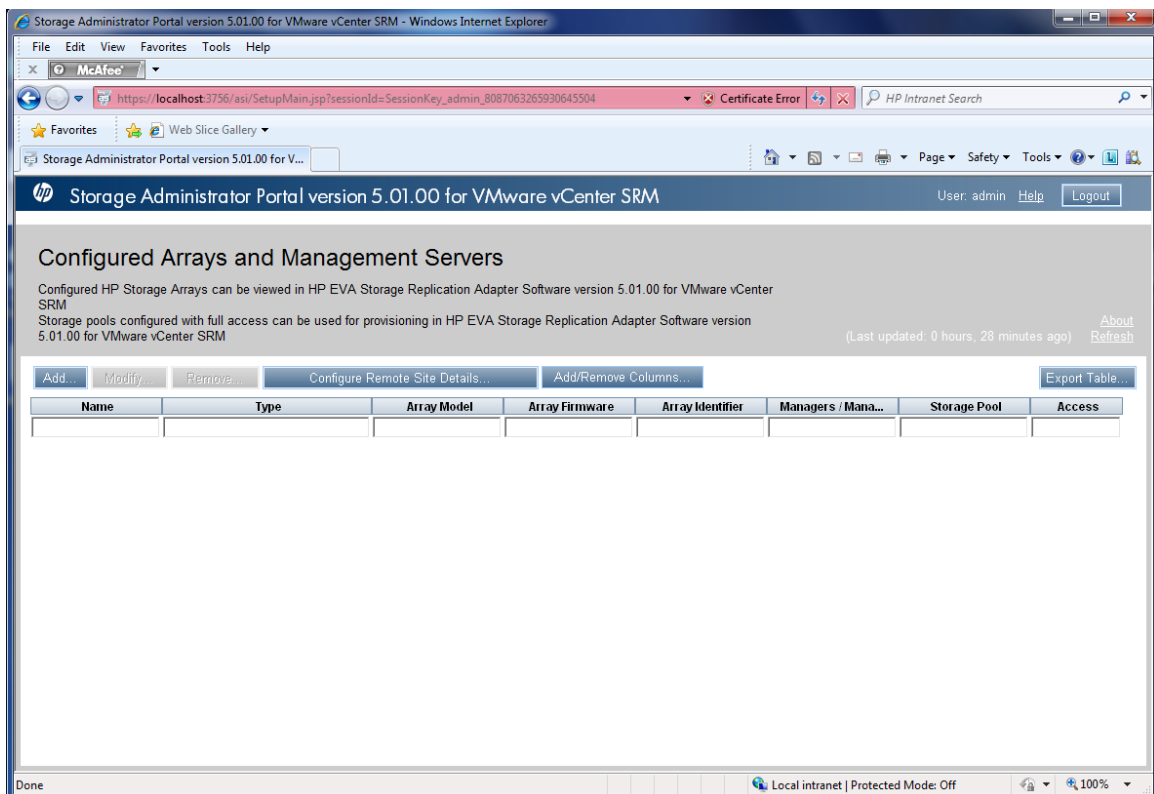
Login Name is **admin** and the password used to log in to Storage Administration Portal is the one set during SRA installation.

Figure 8 Launch Storage Admin Portal from web browser



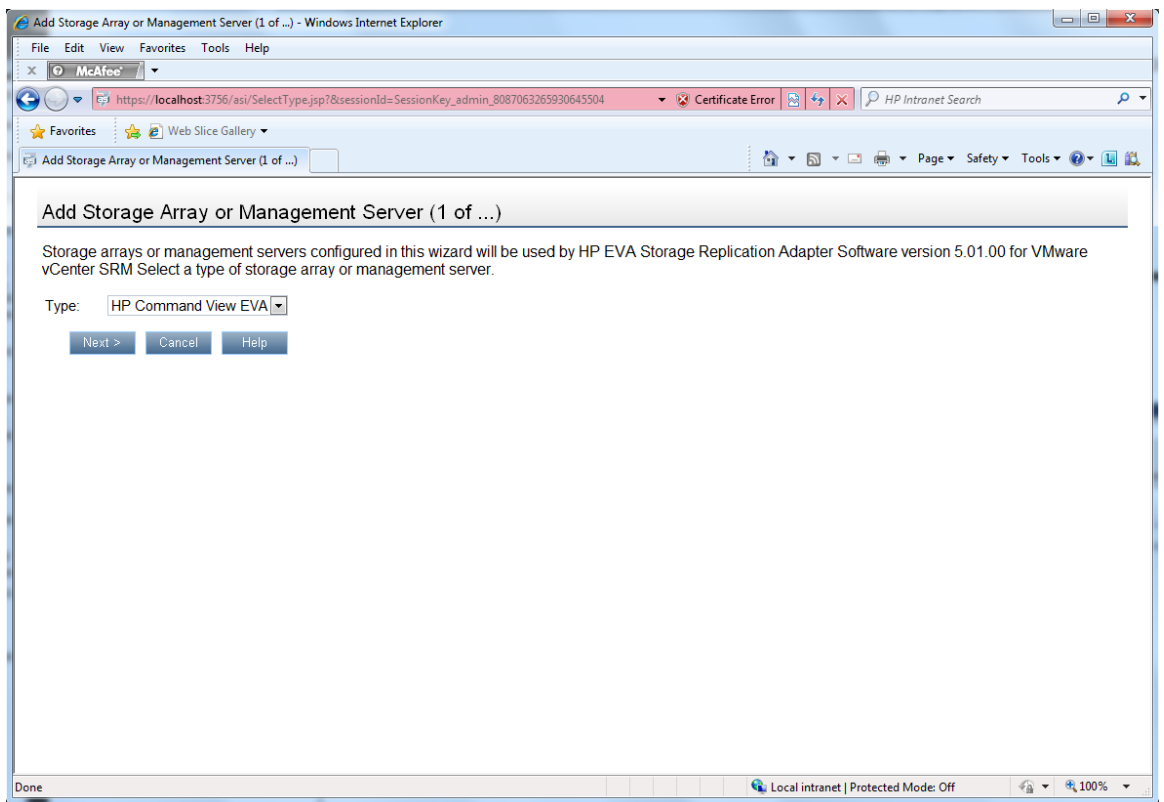
2. Once logged in, add an array manager from the main page by clicking the **Add** button on the left.

Figure 9 Add an array manager



3. Select HP Command View EVA Software for the type of array management server and click **Next**.

Figure 10 Select type of array management server



4. Enter the HP Command View EVA Software address and login credentials for the HP Command View EVA Software used in your SRM environment. You must configure the HP Command View EVA server that is local to the SRM environment. At the primary site storage administrator portal (SAP), add the details of the HP Command View EVA server present at the primary site. Similarly, at the recovery site SAP, add the details of HP Command View EVA server present at the recovery site.

Figure 11 Enter the HP Command View EVA Software address

Add HP Command View EVA (2 of 3)

Please specify all of the parameters for this HP Command View EVA.

Hostname/Server: 10.10.1.61

User Name: administrator

Password: ••••••••

< Back Next > Cancel Help

5. Select the local EVA array being used in your SRM environment and click **Finish**. That is, at the primary site SAP, add the primary site EVA array. Similarly at the recovery site SAP, add the recovery site EVA array.

Figure 12 Select storage arrays

Add HP Command View EVA (3 of 3)

The HP Command View EVA manages the following HP EVAs. Please select the HP EVAs to be added or removed.

Available HP EVAs:

- XL_SRA_4560(50001FE100154560)
- XL_B570(50001FE15002B570)
- LE-CLX-57E0(50014380011957E0)
- 5001-4380-04C8-A190(5001438004C6A190)
- WeiserHSV340_6390(5001438004C96390)

Selected HP EVAs:

- LE3_8DD0(50001FE150098DD0)

Add All >> Add > < Remove << Remove All

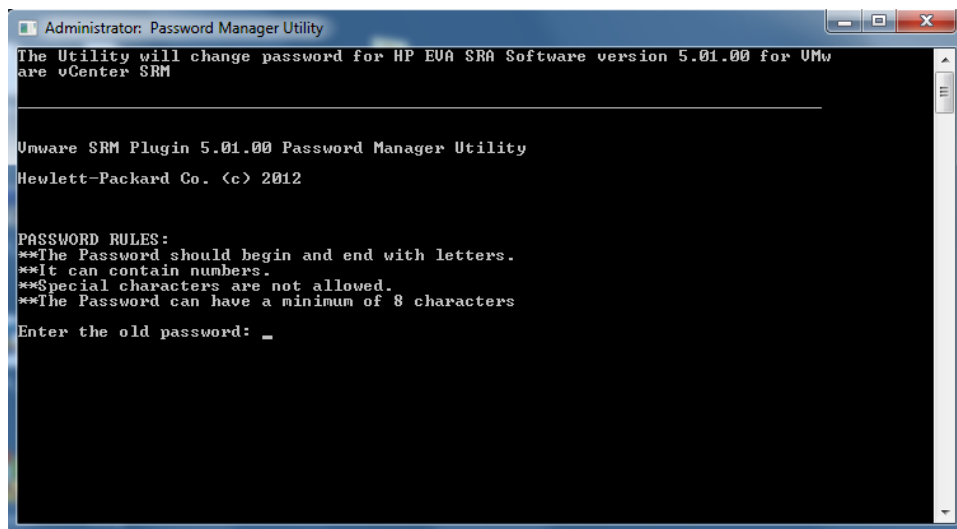
< Back Finish Cancel Help

6. Repeat steps 1 through 5 on the second SRM server located in the other site.

Note that the password for HP EVA SRA Software version 5.01.00 -Storage Admin Portal can be changed by running the Password Management Utility that is installed with the adapter. The Password Management Utility can be launched from the Windows Start menu: **Start > All Programs > Hewlett-Packard > HP EVA Storage Replication Adapter > Password Manager Utility**

Once the password has been changed using the Password Management Utility, be sure to update the array manager configuration information from within SRM with the changed password.

Figure 13 Password Management Utility



In case array management is subject to change, and if local HP Command View EVA Server does not actively manage the array, the following configuration can be used:

1. At the protected site Storage Admin portal, add the local site HP Command View EVA server.
2. Add Protected site EVA array and Recovery site EVA array (see [Figure 14 \(page 18\)](#)).
3. Configure the Remote Site Details (see [Figure 15 \(page 18\)](#)) and enter the details of Recovery site Array Manager (see [Figure 16 \(page 19\)](#)).
4. Repeat these steps for Recovery site Storage Admin Portal. In step 3, enter the Primary site Array Manager details.

The ports for the remote site will be 3756 by default (unless it has been changed during installation). This can be verified at each site by looking at the URL for the Storage Admin Portal application (see [Figure 17 \(page 19\)](#)). If the Protected and Recovery site SRM servers are behind a firewall, ensure that these ports are open for traffic through the firewall at respective sites.

NOTE: These are the array manager credentials for the remote site as specified in SRM and not the remote site CV credentials.

If array management changes across HP Command View EVA servers, you must refresh the array management information in the Storage Admin Portal by clicking the **Refresh** link. Failure to perform this refresh may cause SRM operations to fail.

In this configuration where both the EVA arrays are configured in the Storage Admin Portal, the same array pair will get listed twice in the SRM GUI after array discovery (see [Figure 18 \(page 20\)](#)). Make sure that array pair is enabled only once (click on Enable for the Protected site array at the Protected site Array Manager in the SRM GUI. See [Figure 19 \(page 20\)](#) through [Figure 21 \(page 21\)](#)). Enabling the same array pair twice will cause SRM operations to fail.

Figure 14 Add remote array in portal

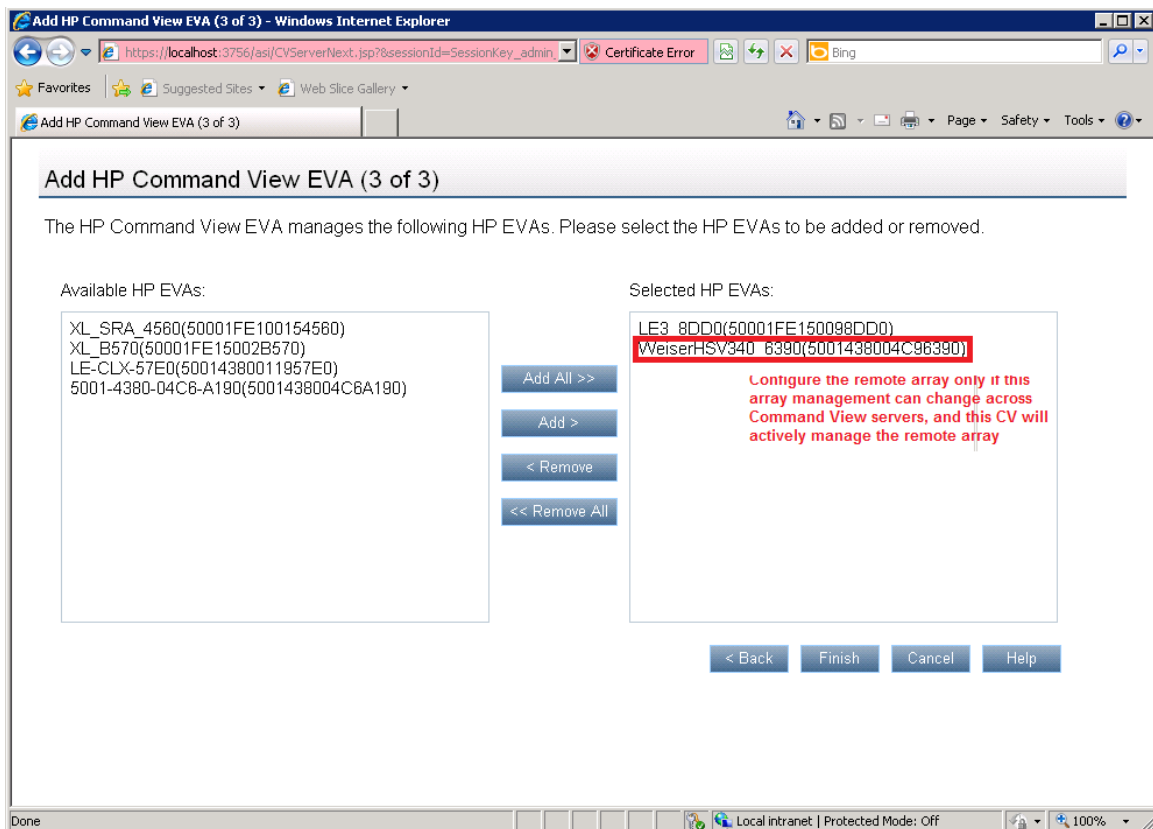


Figure 15 Configure Remote Array Manager

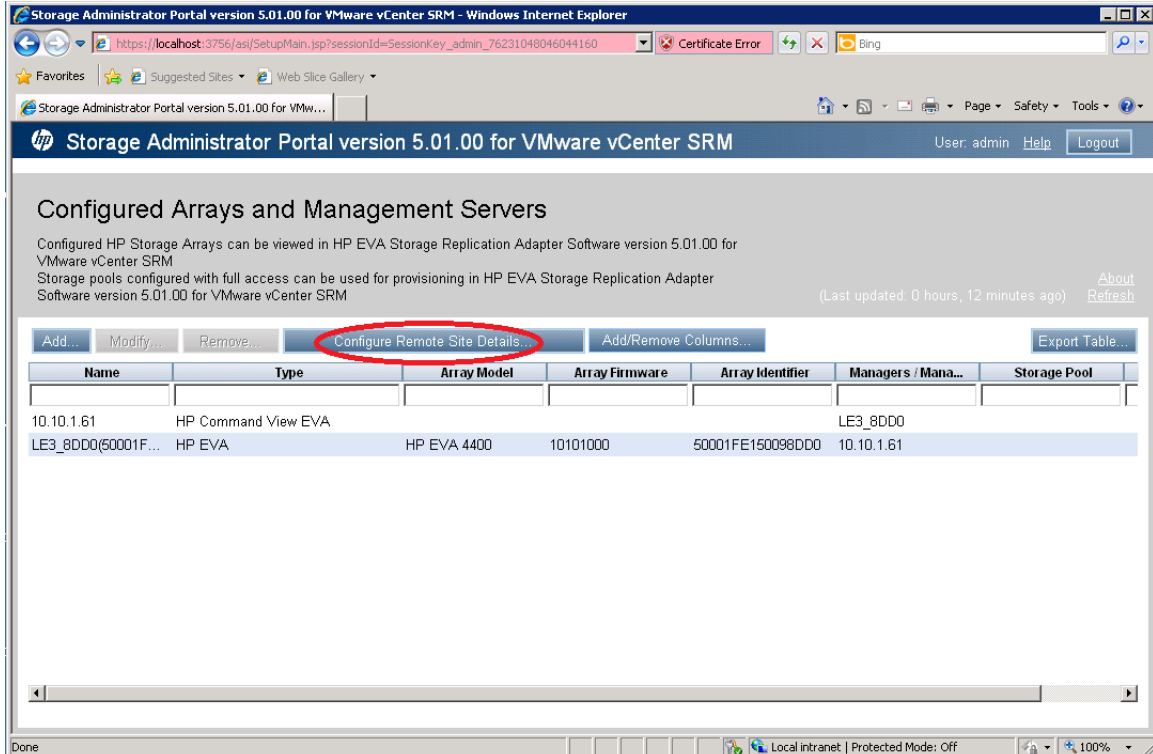


Figure 16 Configure Remote Array Manager details

Array Manager Details for Remote Site

Please specify the Array Manager credentials for the Remote Site.

Enable this option only if the remote site Command View Server actively manages the local array ☒

Remote Site Array Manager IP:

Remote Site Array Manager Port:

Remote Site Password:

Figure 17 Remote Array Manager port to configure

HP EVA Storage Replication Adapter Software version 5.01.00 for VMware vCenter SRM; Storage Admin - Windows Internet Explorer

HP EVA Storage Replication Adapter Software version 5.01.00 for VMware vCenter SRM
Storage Administrator Portal

Login Name:

Password:

Figure 18 Array pair listed twice

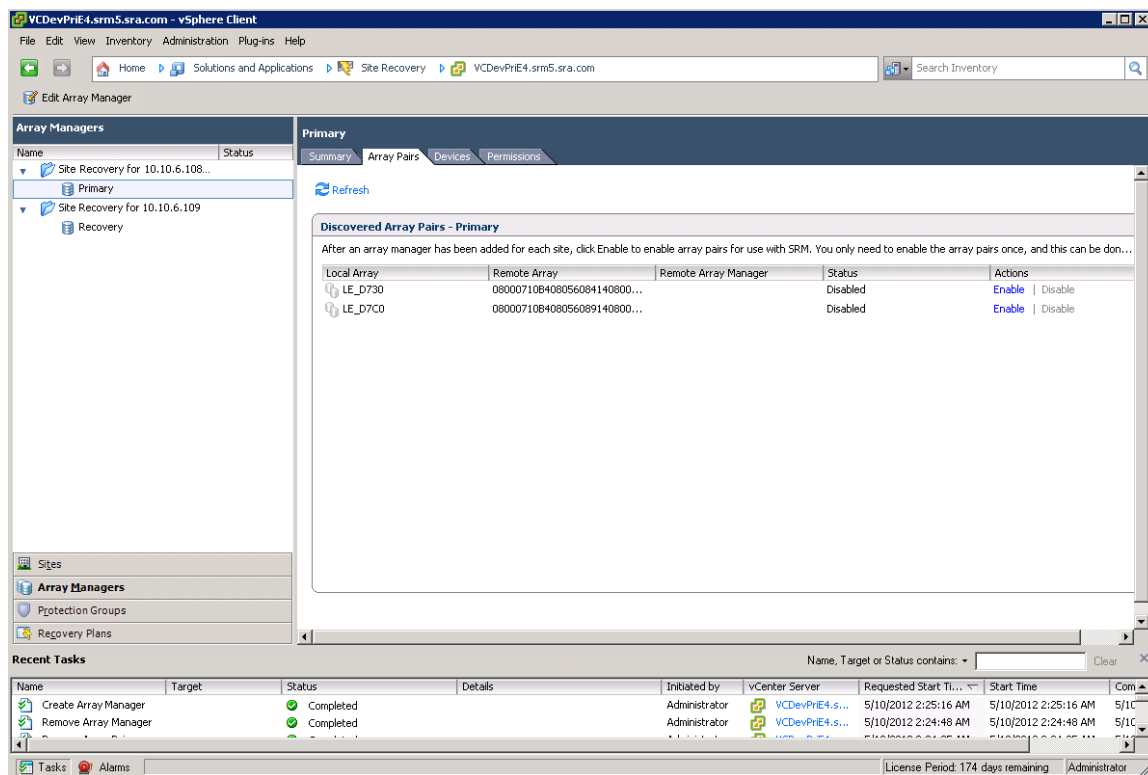


Figure 19 Enable array pair only in one direction

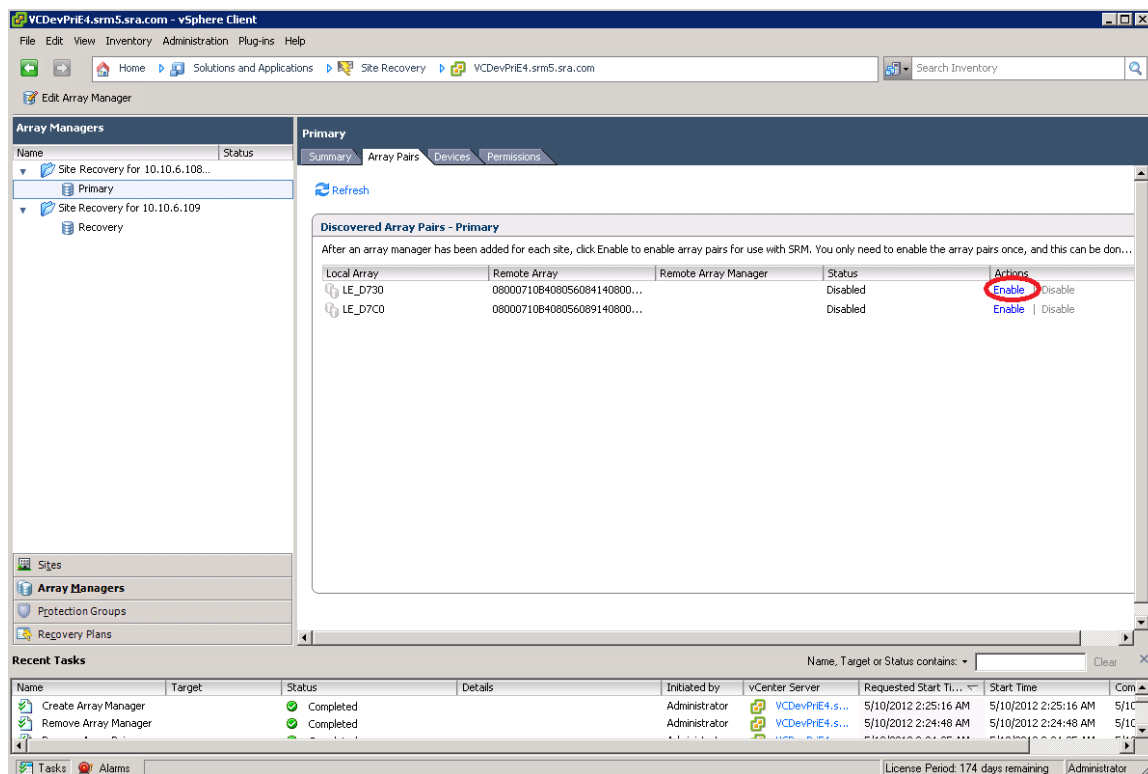


Figure 20 Array pair enabled at primary site

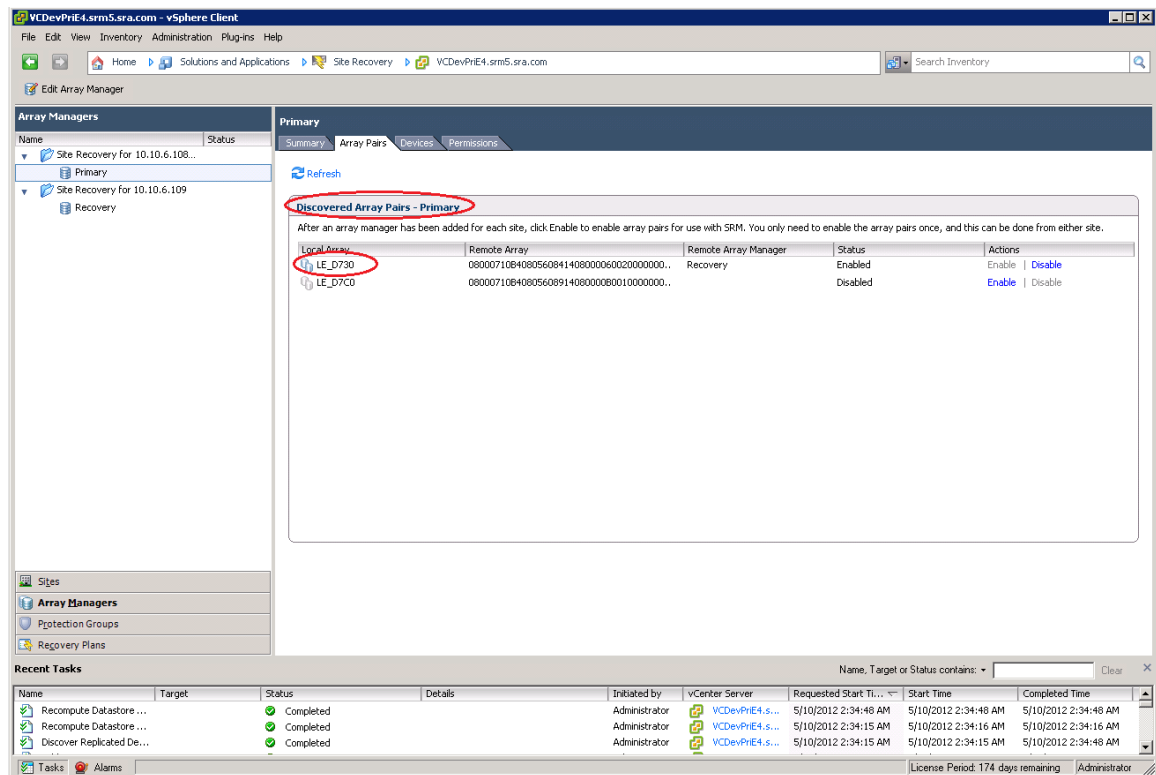
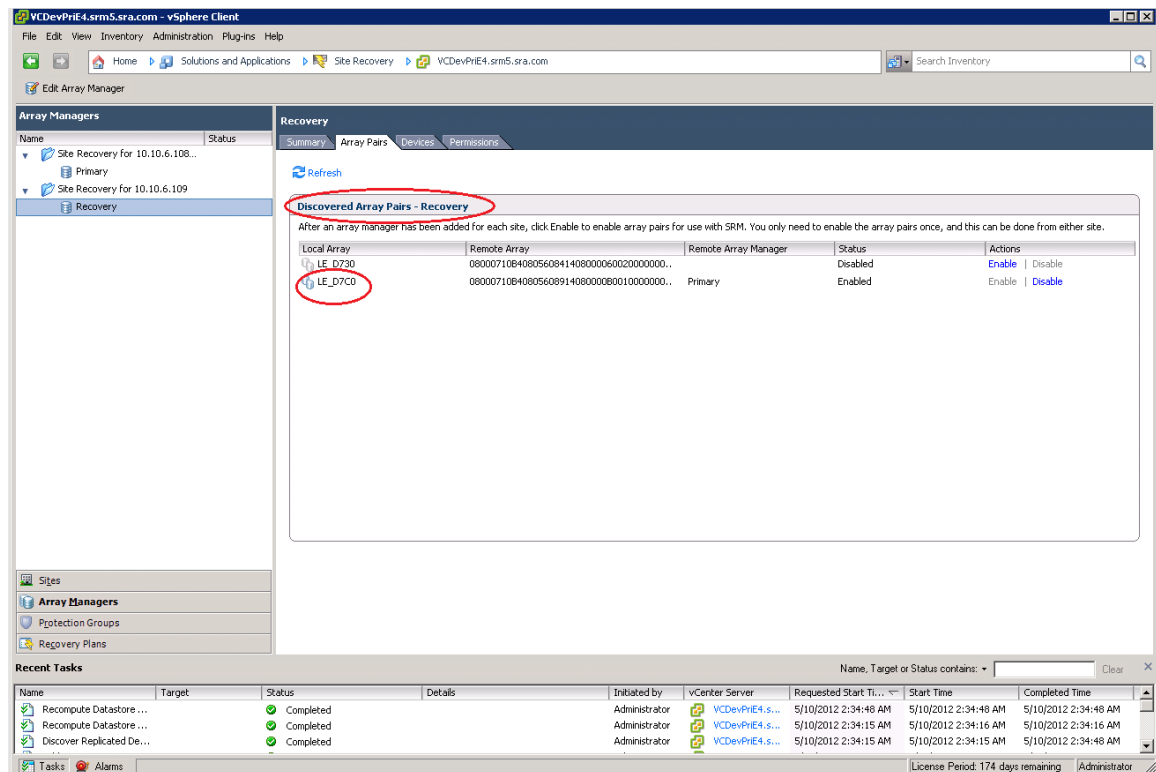


Figure 21 Array pair enabled at recovery site



Pairing SRM sites

To pair the protected and recovery sites in SRM, follow the instructions in the *VMware Site Recovery Manager Administration Guide*.

Configuring SRM to communicate with HP EVA Storage

After you have connected to the protected site and recovery site, you must configure their respective array managers so that SRM can discover replicated devices, compute datastore groups, and initiate storage operations:

1. From the SRM GUI, select the **SRAs** tab to ensure that the HP EVA Replication Adapter for VMware Site Recovery Manager has been installed and is recognized by SRM (see [Figure 22 \(page 22\)](#)).
2. Right-click the place holder for the protected site and select **Add Array Manager** to initiate the SRM array manager configuration wizard (see [Figure 23 \(page 23\)](#)).

Figure 22 SRAs tab

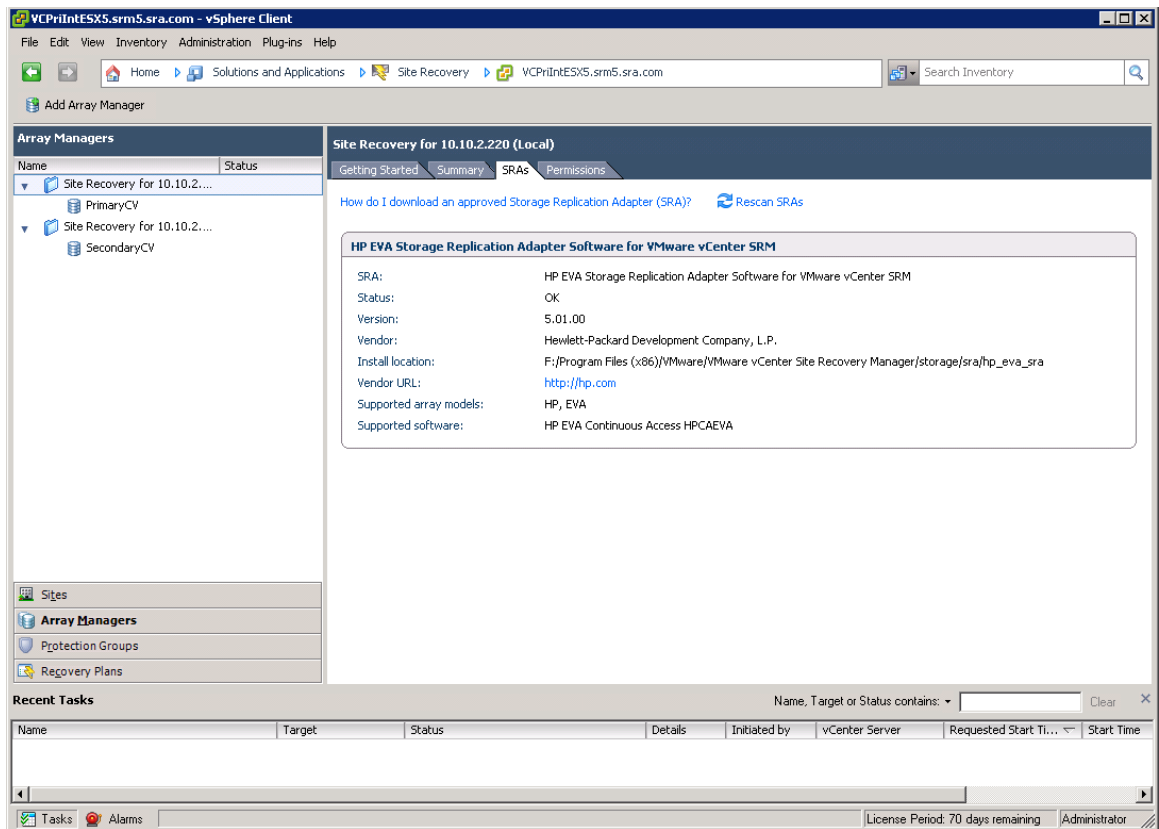
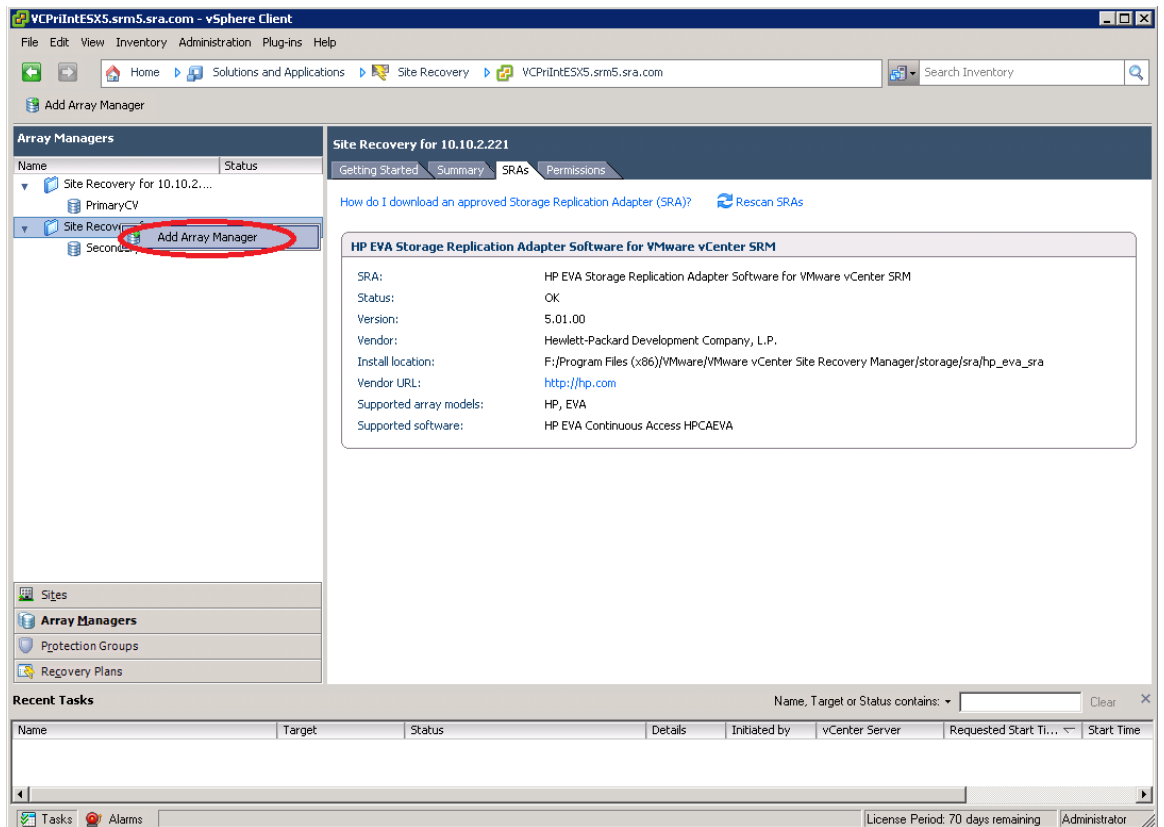
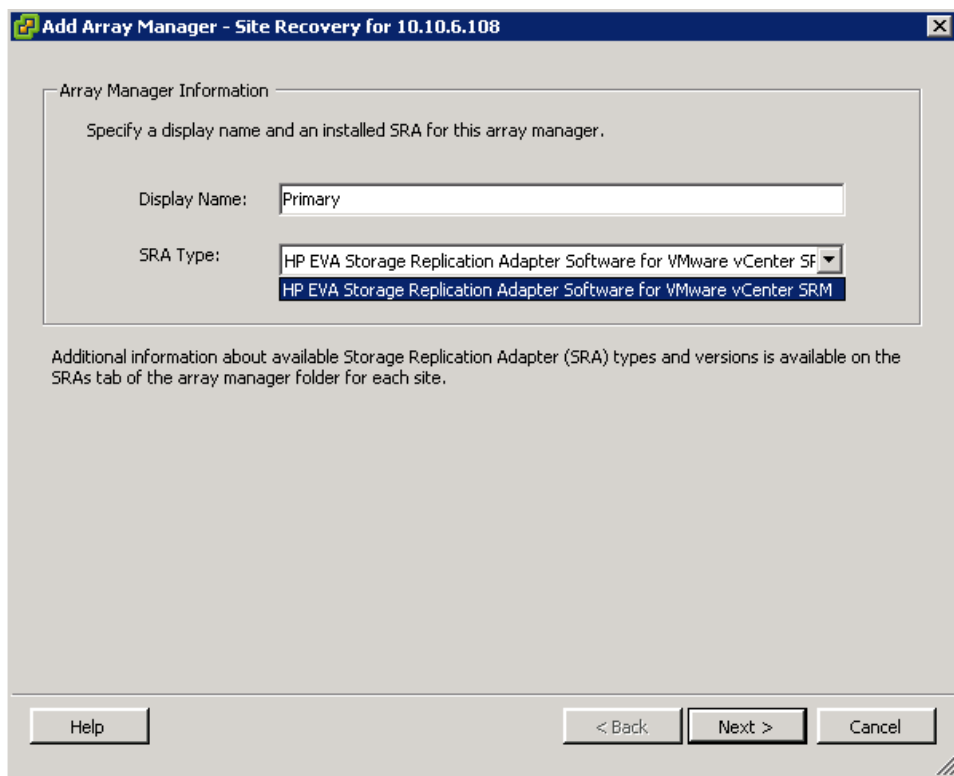


Figure 23 Add array manager



3. Make sure that the array manager type **HP EVA Storage Replication Adapter Software for VMware vCenter SRM** appears in the SRA Type drop-down field and select it (see Figure 24 (page 23)).

Figure 24 SRA type



4. Enter HP EVA Storage Administrator Portal connection parameters for the protected site. The IP address is the location where the Storage Administration Portal is configured, which is typically the same IP as the protected SRM server (see [Figure 25 \(page 24\)](#)).

Figure 25 Enter IP address

Add Array Manager - Site Recovery for 10.10.6.108

HP EVA Storage Replication Adapter Software for VMware vCenter SRM

HP EVA SRA Storage Administrator Portal

HP EVA SRA Storage Administrator Portal connection parameters

IP Address:
Enter IP address of the HP Storage Administrator Portal

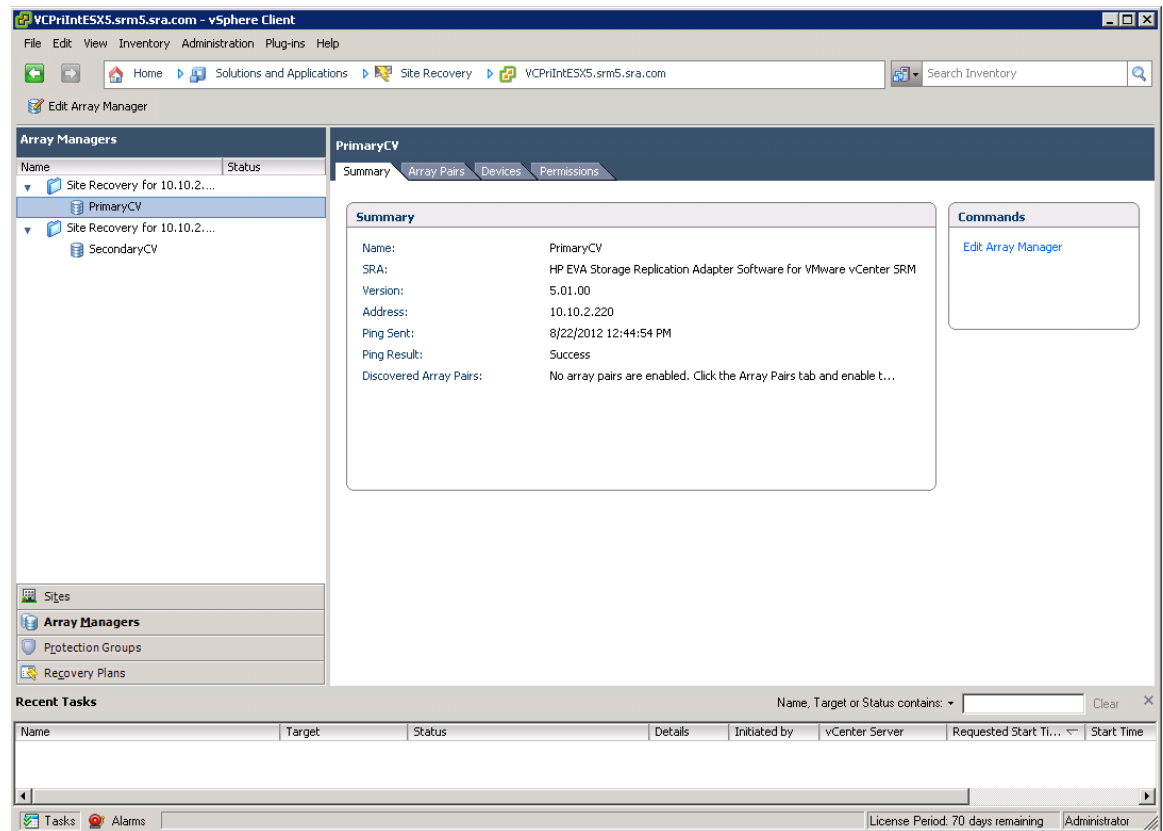
Username:
Enter user name for the HP Storage Administrator Portal

Password:
Enter password for the HP Storage Administrator Portal

Help < Back Next > Cancel

5. Once the SRA is successfully configured at the protected site, the configuration summary can be reviewed using the SRM GUI (see [Figure 26 \(page 25\)](#)).

Figure 26 Review configuration summary



Create protection groups

Protection groups (containing replicated virtual machines) fail over the storage and VMs to the recovery site during test and recovery. To create protection groups, follow the instructions in the *VMware Site Recovery Manager Administration Guide*.

Create recovery plans

A recovery plan is a list of steps the SRM follows on a protected site to switch operation from the protected site to the recovery site during a disaster (or test operation). A basic recovery plan includes a number of prescribed steps that use default values to control how virtual machines in a protection group are recovered at the recovery site. You can customize the plan to meet your needs. Recovery plans are different from protection groups in that recovery plans indicate how virtual machines in one or more protection groups are restored at the recovery site.

For more information about recovery plans and how to configure them recovery plans on the recovery site, follow the instructions in the *VMware Site Recovery Manager Administration Guide*.

3 Installing and removing HP EVA SRA Software version 5.01.00

This chapter explains how to install and configure HP EVA SRA Software version 5.01.00.

-
- ❗ **IMPORTANT:** A successful installation depends on using compatible versions of the OS and all installed software. For version requirements, see *HP EVA SRA Software version 5.01.00 Release Notes*.
-

NOTE: If a version of the adapter earlier than 5.01.00 is installed, it must be uninstalled before installing the one described in this guide.

If SRA version 5.0 is installed, it can be upgraded to the new version 5.01.00 by running the new 5.01.00 installer binary `HP_EVA_SRA_5.01.00.exe`. You must perform a system reboot after uninstall or upgrade operations.

Installation directory

SRA can be installed on any drive and location, depending on where SRM is installed.

`<SRM install location>VMware vCenter Site Recovery Manager\storage\sra\hp_eva_sra`, where `<SRM install location>` is `C:\Program Files (x86)` or `C:\Program Files` by default.

A system reboot is required after uninstall or upgrade operations.

Installation prerequisites

To install HP EVA SRA Software version 5.01.00, you must have administrator privileges, and VMware Site Recovery Manager must already be installed on the server. In addition, SRM should be installed, Windows User Account Control (UAC) needs to be turned off before the SRA installer can run, and versions earlier than 5.0 of the SRA must be uninstalled.

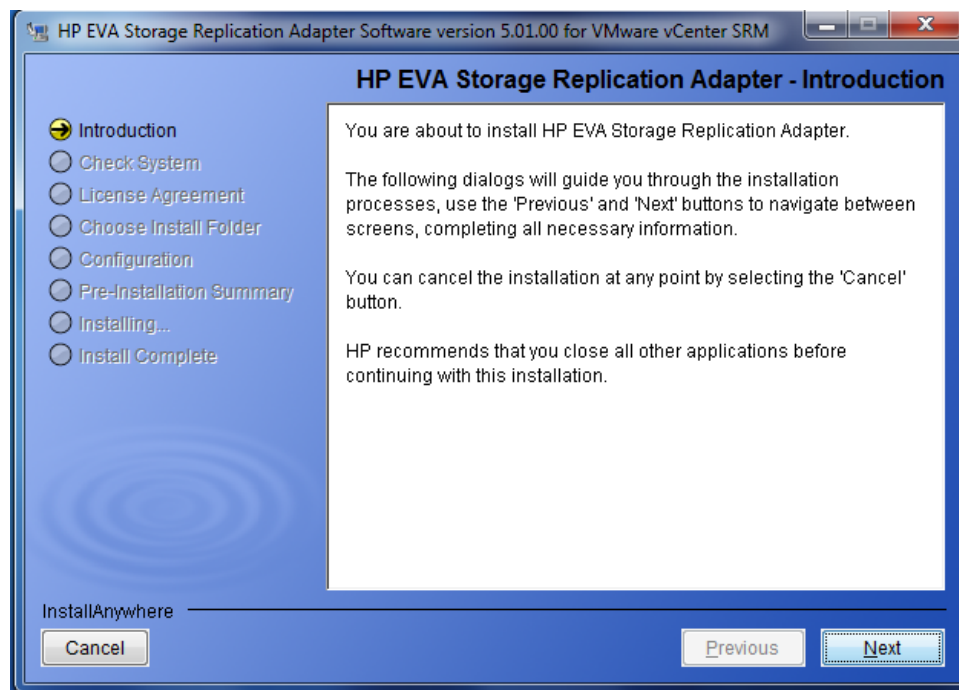
Installing HP EVA SRA Software version 5.01.00

HP EVA SRA Software version 5.01.00 is installed using the latest installation executable, downloaded from [hp.com](http://www.hp.com). The executable is `HP_EVA_SRA_5.01.00.exe`.

NOTE: Both the protected site and recovery site should have the same version of SRA installed: HP EVA SRA Software version 5.01.00.

1. Download the HP EVA SRA Software version 5.01.00 installation file from the HP web page (<http://www.hp.com/go/storage/vmware>) and save it in a temporary folder.
2. Browse to the temporary folder and extract the HP EVA SRA Software version 5.01.00 installation files.
3. After the files are extracted, click **HP_EVA_SRA_5.01.00.exe** to start the installation. The installer window appears (see [Figure 27 \(page 27\)](#)).

Figure 27 SRA installer



4. Click **Next**. The License Agreement window opens.
5. Click **I accept the terms of the license agreement** and then click **Next**. The Ready to Install the Program window opens.
6. Review the default ports used for the storage module and make any changes if there is a conflict or there are requirements to do so and then click **Next**
7. Review the default ports used for the storage module J2EE and make any changes if there is a conflict, or there are requirements to do so, and then click **Next**
8. Set the password for CAAL Services (this is the password used to log into the Storage Administration Portal) then click **Next**.

Password rules are as follows:

- The password must begin and end with letters.
 - The password may contain numerals.
 - Special characters are not allowed.
 - The password must have a minimum of eight characters.
9. Review the installation information and click **Install**.
 10. Once the installer has finished, click **Done** to complete installation of the SRA.

NOTE: After this step, an option will be available to view the release notes.

NOTE: For SRM to detect the newly installed SRA, click **Rescan SRAs** in the SRA GUI under the **SRAs** tab within the Array Managers screen.

Verifying the installation

After HP EVA SRA Software version 5.01.00 is installed, it appears in the Windows **Add or Remove Programs** window as "HP EVA Storage Replicatoin Adapter" (Figure 28 (page 28)).

Verify that the "HP EVA SRA Storage Module Service" is registered and started in the windows services listing Figure 29 (page 28)).

Figure 28 Add/Remove programs listing

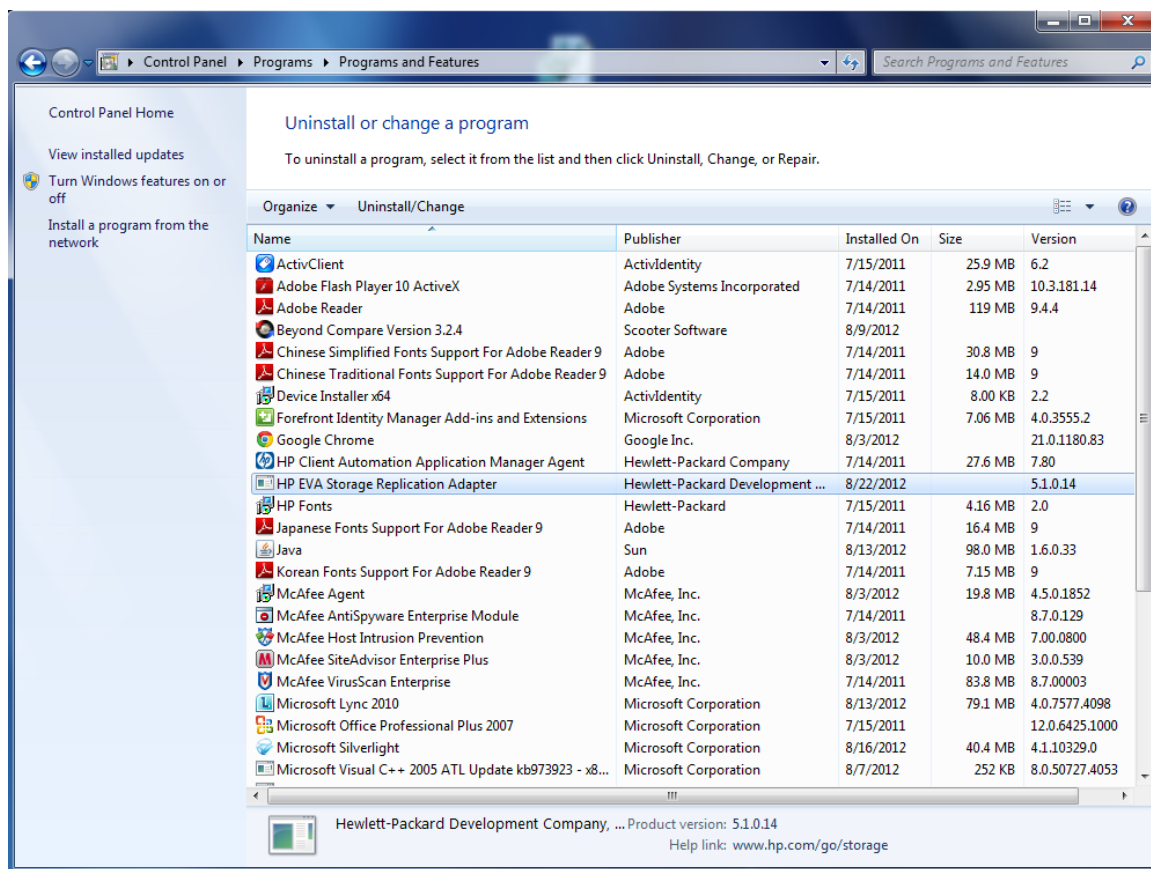
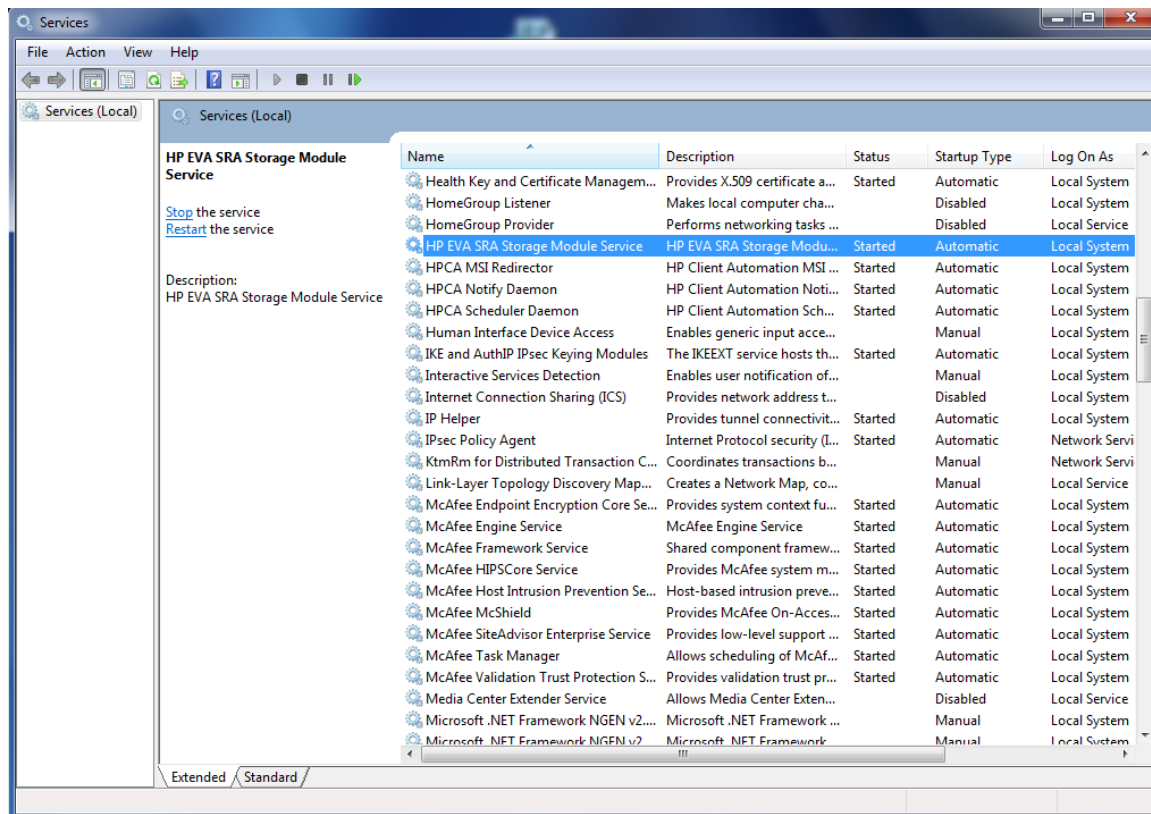


Figure 29 Verify installation



Removing HP EVA SRA Software version 5.01.00

1. In Windows, select **Start > Settings > Control Panel**.
 2. Select **Control Panel\Programs\Programs and Features**.
 3. Select **HP EVA Storage Replication Adapter**.
 4. Click **Uninstall/Change**. Windows removes the program.
-

NOTE: If SRM is to be uninstalled or upgraded, HP recommends that you uninstall the HP EVA SRA Software first and then uninstall or upgrade SRM.

4 Recovery and failback

Recovery

Recovery occurs when an SRM recovery plan is configured with SRM protection groups that use replicated EVA vdisks as a datastore is executed. A recovery plan can be used for DR or planned migration of VM between data centers.

During normal operation, the replication path is from a protected site (local site) to a recovery site (remote site). If a failure occurs at the local site (due to hardware failure or an entire site loss) the SRM recovery plan can be executed, which calls the SRA to reverse replication direction from the recovery site to the protected site. With HP EVA SRA Software version 5.01.00 and SRM, the failover process is an automated feature and the process is executed using a recovery plan located at the recovery site.

NOTE: HP recommends that you set the DR group write mode to *Synchronous* before performing a planned failover. This ensures that:

- The data is current.
- The failover does not result in full-copy (reverse copy) from secondary site to primary site vdisks.

NOTE: If HP EVA SRA Software version 5.01.00 is called by SRM during an entire loss of the primary site, HP recommends that you click **Refresh** from within the Storage Administrator Portal.

Failback

Failback is the process of setting the replication environment back to its original state at the protected site (local site) prior to failover. Failback can be managed as a normal server migration process. However, managing the failback process with SRM is an automated process once the old protected site is restored and SRM is used to reprotect recovered protection groups.

Restore replication after failover

Replication can be restored from the original protected site (A) to the original recovery site (B), discarding all changes made at site (B) since failover. This operation is not possible from the SRM GUI. However, the operation can be done by executing the commands `prepareRestoreReplication` and `restoreReplication` in sequence. These commands can be called from the command prompt using XML input files.

NOTE: If the commands are executed from the command prompt, the SRM GUI may not reflect the latest status.

The following points must be taken into account if you want to run the SRM `restoreReplication` and `prepareRestoreReplication` commands from the command prompt using XML input files:

- **Prerequisite:** `RestoreReplication` succeeds only when a snapshot is created by SRA during the recovery command operation. For a snapshot to be created, a BC license must be installed.
- **DR replication settings requirements:**
 - For DR replication mode set to synchronous, no additional settings are required for the DR Group, just run the commands.
 - For DR replication mode set to asynchronous-Enhanced or asynchronous-Basic, execute the following steps from the HP Command View EVA server before executing the command:

1. Set the DR group property **Suspend on full copy** to **Disabled**.
2. If the DR Group setting Replication I/O is in the **Suspended** state, change the state to **Resumed**.
This will initiate the Full Copy Operation.
3. Make sure the Full Copy operation is complete and that the state of DR Group members shows **Normal**.

5 Collecting SRA logs

Collect SRA logs from locations at both the primary and recovery sites. HP EVA SRA Software version 5.01.00 logs are located in the following folders:

- %SRA_LOCATION%\Logs
 - %SRA_LOCATION%\Storage\JBoss\standalone\log
- where: %SRA_LOCATION% is <SRM install location>\VMware\VMware vCenter Site Recovery Manager\storage\sra\hp_eva_sra and <SRM install location> is C:\Program Files (x86) or C:\Program Files by default.

Generating detailed logs

On both the primary and recovery sites, perform the following steps to reproduce the issue:

1. Stop the HP EVA SRA Storage Module Service.
2. Edit the registry key TraceLevel available at:
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Hewlett-Packard\SRASroageModule\EVAEMDOWrapper\Parameters and HKEY_LOCAL_MACHINE\SOFTWARE\Hewlett-Packard\SRASroageModule\EVAEMDOWrapper\Parameters
Set the value to 122 (decimal).
3. Edit the standalone.xml in the path C:\Program Files (x86)\VMware\VMware vCenter Site Recovery Manager\storage\sra\hp_eva_sra\Storage\JBoss\standalone\configuration:
Add an entry under <system-properties> like **<property name=" array.trace " value="ALL"/>**.
4. Restart the HP EVA SRA Storage Module Service.

Collect the SRM logs from the default locations (C:\ProgramData\VMware\VMware vCenter Site Recovery Manager\Logs) at both the primary and recovery sites.

6 Troubleshooting HP EVA SRA Software version 5.01.00

NOTE: Error messages are logged to the SRM log files.

The following problems and solutions are typical.

HP EVA SRA Software version 5.01.00 does not install

Solution: Make sure that SRM is installed. Ensure Windows User Account Control (UAC) is switched off.

Virtual machines do not start at recovery site after failover

Causes:

- The ESX recovery hosts are not configured with the correct HBA port WWN on the recovery EVA.
- The replicated vdisks used in failover were not presented to the recovery ESX servers.

Site Recovery Manager timeout failure in large array configurations

Solution: Increase the SRM timeout value (CommandTimeout) in the Advanced Settings by right clicking one of the SRM Sites, selecting **Advance Settings > storage** and increasing the value of **storage.commandTimeout**.

Virtual machines do not start at recovery site during the test failover test

Cause: The ESX recovery hosts are not configured with the correct HBA port WWN on the recovery EVA.

SRM environment is healthy, yet HP EVA SRA Software version 5.01.00 is not operating as expected

If HP Command View EVA Software active management has been switched between management servers after initial Storage Administrator Portal configuration, HP recommends that you click **Refresh** from the Storage Administrator Portal at the Primary and Recovery sites.

Array management changes not reflected in SRA

After CV servers and arrays are configured in Storage Admin portal and after SRM does `discoverDevices`, if the user changes array management across CV servers, this does not get automatically reflected in the SRA setup. You must click **Refresh** in the Storage Administrator Portal at Primary and Recovery sites.

After a site crash, as part of failover, we take the array management to the available CV server (if the original CV has gone down) and perform the operations. Once the site is brought back up and CV is back again and the array management is brought back to the original CV, the user is advised to run `refresh` in the Storage Administrator Portal at the Primary and Recovery sites, so that this change of array management is reflected in SRA.

CV credential changes

After changing CV credentials, log in to the HP Storage Admin Portal, remove the CVs, add them again, and then rescan the Arrays.

Forgotten credentials

If you forget the credentials of HP Storage Administrator Portal, you must reinstall the SRA.

Increase timeout value after array configuration

After arrays are configured in SRM, it is advisable to increase the storage adapter timeout value from the default 300 seconds. To increase the timeout values, click **Sites** from the SRM menu, right click one of the listed sites, and select **Advanced Settings**. From within the Advanced Settings window, select **storage** in the left-hand pane and increase the value of `storage.commandTimeout`. Repeat this process for both SRM sites. See [Figure 30 \(page 34\)](#) and [Figure 31 \(page 35\)](#).

Figure 30 SRM menu

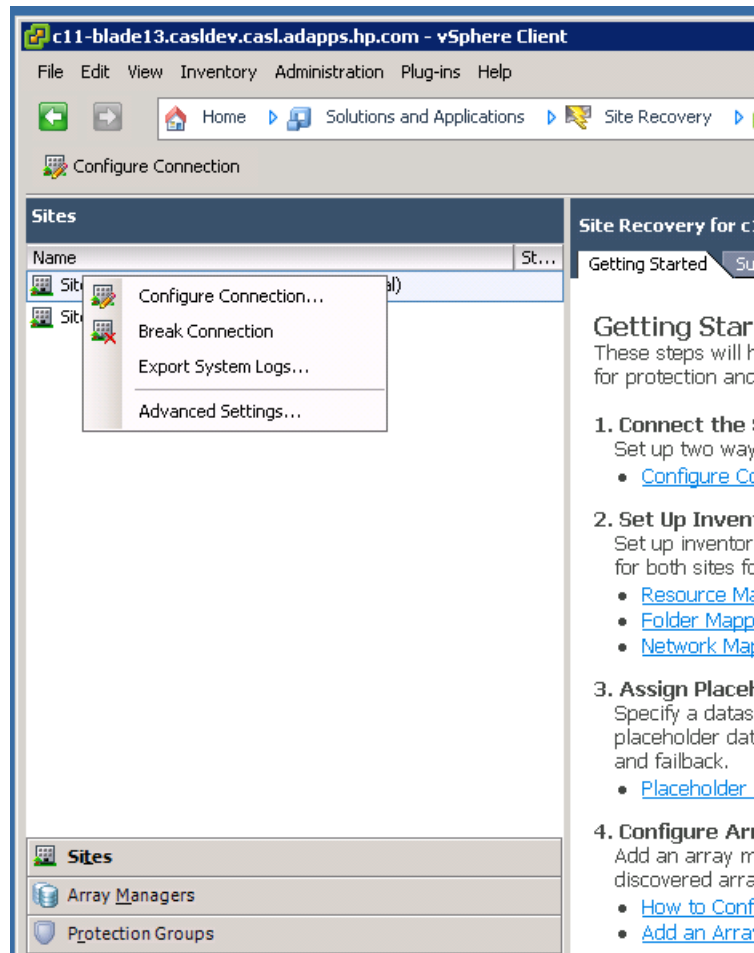
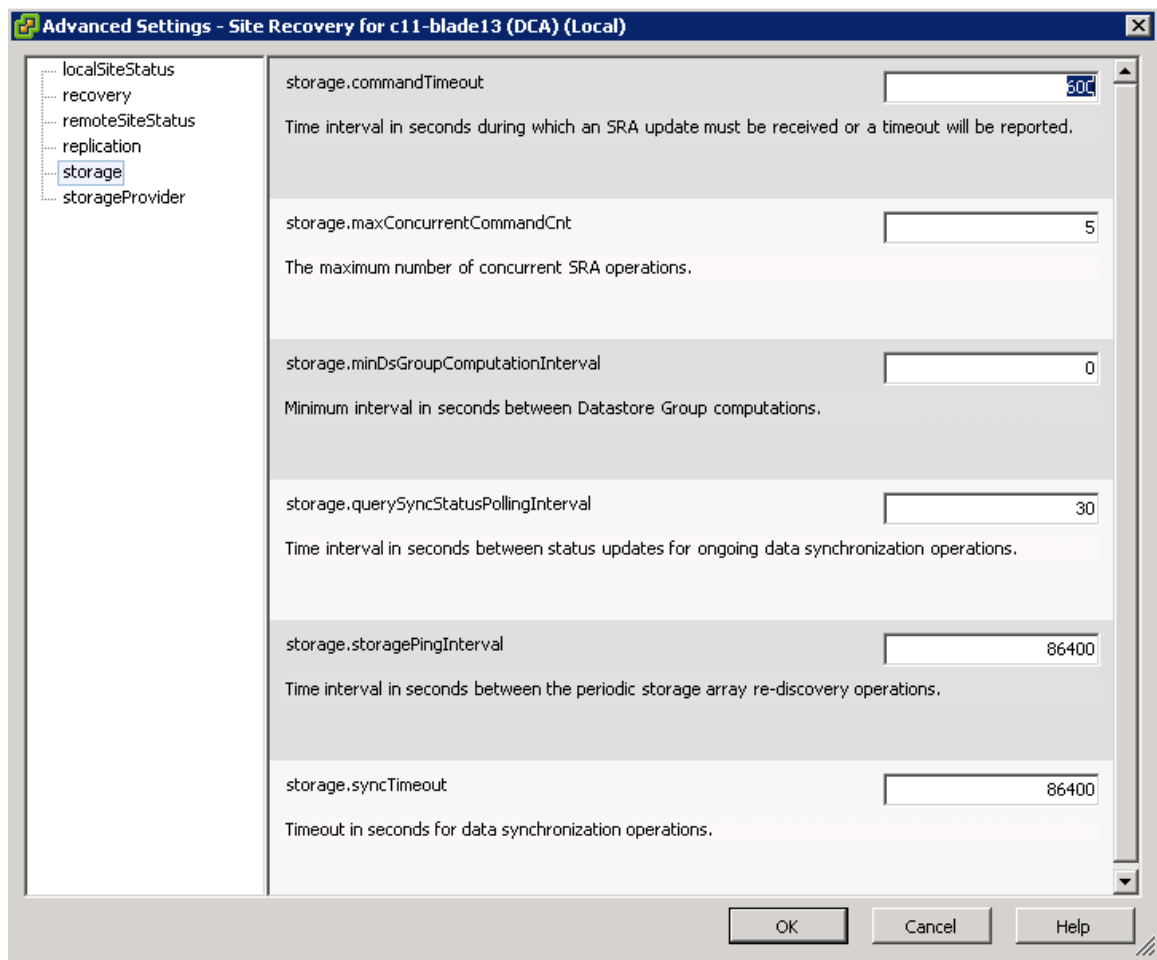


Figure 31 Advanced Settings window



If the protected site has crashed and protected virtual machines fail to recover at the target site

There may be instances where the HP Command View EVA management servers have been configured such that the protection site HP Command View EVA server is actively managing both protection and recovery site arrays (and the recovery site HP Command View EVA server is passively managing both arrays). This configuration is valid, but if an attempt to run a recovery plan fails during a DR scenario where there is loss of the primary data center, the following steps may need to be performed at the recovery site before reattempting to run the recovery plan:

1. Manually assume active management of the recovery site array with the recovery site HP Command View EVA server by logging in to the HP Command View EVA application at the recovery site and enabling management.
2. Restart the windows service "HP EVA SRA Storage Module Service" on the recovery site SRM server.
3. Perform the recovery operation from the SRM GUI .

Error messages

HP EVA SRA Software version 5.01.00 error messages are logged to SRM and HP EVA SRA Software version 5.01.00 log files. [Table 1 \(page 36\)](#) lists error messages and their meanings.

SRM shows the message Cannot find matching consistency group at remote site for <DR Group name>. Log on to HP HP Command View EVA Software and delete any comments that are present in the DR Group in question. DR Group comments are set and read by the SRA, and it left-over artifacts can confuse SRM.

SRM log

VMware provides a tool with SRM that gathers all SRM logs and saves them to the desktop. See SRM documentation for more detail.

NOTE:

- By default, logs roll over after reaching 5 MB.
- The most recent Log File number is located in `vmware-dr-index`.

SRA logs

HP EVA SRA Software version 5.01.00 logs are located in: `%SRA_LOCATION%\Logs` and `%SRA_LOCATION%\Storage\JBoss\standalone\log` folders.

For the `%SRA_LOCATION%`, see [Page 26](#).

HP EVA Storage Adapter error messages

Table 1 HP EVA SRA Software version 5.01.00 error and warning messages

GUI error message	Description/corrective action
Array <EVA ID>s being actively managed by a different SMA.	The array being requested by SRM is actively managed by a different HP Command View EVA Software host.
Could not create snapshot.	During a test failover operation, the action to create a snapshot failed due to an internal error on the EVA.
Could not determine DR Group membership of one or more virtual disk.	A LUN ID was input from SRM to the adapter, but it could not be found in any existing DR group.
Could not find the specified VDisk: <LUN ID>.	A LUN ID was input from SRM to the adapter, but it could not be found on the EVA.
Could not populate array information.	A connection was made to HP Command View EVA Software, but the EVA information could not be obtained.
Could not populated list of managed arrays.	A connection was made to HP Command View EVA Software, but the EVA information could not be obtained.
Creating snapshot of <LUN ID>.	A snapshot of the replicated LUN is currently being created.
Data Replication Group for <DR Group> already in source mode.	A LUN ID input from SRM has already been failed over at the DR group level.
Failover of DR Group <DR Group name> was unsuccessful.	During a failover of a DR group associated with a replicated LUN, an error occurred.
Initialization of CV Client failed using IP address <management host address>.	The address or login credentials to the management host may be incorrect, preventing the adapter from connecting.
Initialization of the Element Manager object failed.	Connection to the HP Command View EVA Software host could not be initialized.
No test snapshots found.	A test failover stop operation was called, but no test snapshots from the test failover stop operation exists.
Presentation of the vdisk <LUN ID> to the host <host name> has failed.	During a test failover operation, the presentation of a snapshot to a ESX host failed due to an internal error on the EVA.
Previously created SRM snapshot found.	During test failover start or stop, a test SRM snapshot has been detected on the array. Unexpected snapshot found must be deleted before continuing operation
Storage Array <EVA ID> not found on current management host.	The array being requested by SRM is actively managed by a different HP Command View EVA Software host.

Table 1 HP EVA SRA Software version 5.01.00 error and warning messages (continued)

GUI error message	Description/corrective action
Successfully deleted <SRM test snapshot name>.	During test failover stop, a test SRM snapshot has been deleted.
There are no Data Replication Groups to failover.	All replicated LUNs specified by SRM are already in a failed over state, or do not belong to a DR Group.
VDisk <LUN ID> is not a member of a known Data Replication Group.	A LUN ID input from SRM does not belong to any known DR Group.
Could not retrieve information about consistency group ConsistencyGroup.	Ensure arrays are functional and that ConsistencyGroup is available.
Could not retrieve information about device DeviceName.	Ensure arrays are functional and that DeviceName is available.
Consistency group ConsistencyGroup is already in source mode.	Consistency group ConsistencyGroup is already source on array StorageName.
Failover of consistency group was unsuccessful.	An error occurred while attempting to failover consistency group. Check storage system for more information.
Connection to storage management services failed at address CoreServiceAddress.	The address or login credentials to the management host may be incorrect, preventing the adapter from connecting. Ensure adapter login credentials are set correctly.
No snapshots found.	Operation expected to find snapshots of the device DeviceName, but none were found.
Presentation of the device DeviceName to the ESX server EsxHostName failed.	Ensure ESX server EsxHostName has been zoned and configured correctly with storage array StorageName and that devices can be presented to the host.
Storage Array StorageName not found on current management host.	The array being requested by SRM may be actively managed by a different array manager or might not be configured with the current array manager.
There are no consistency groups to failover.	All replicated LUNs specified by Site Recovery Manager are already in a failed over state, or are not being replicated.
Device DeviceName is not a member of a known consistency group.	Ensure DeviceName is a member of a consistency group.
None of the input initiator group IDs match up with any hosts visible to the storage array.	Ensure ESX server EsxHostName has been zoned and configured correctly with storage array StorageName.
Unpresent of existing snapshot failed.	Ensure that snapshot is presented to the host.
Delete of existing SRM snapshot failed.	Verify that snapshot exists,
Consistency Group ConsistencyGroup is in Target Mode.	Ensure the consistency Group ConsistencyGroup should be in the Target Mode StorageName.
Failed to modify replication groups Replication Group.	Ensure that the replication group can be modified.
Could not retrieve replication group with ID ReplicaGroupID from local array.	Check the replica group ID passed from SRM.
The replication group ReplicaGroupName is in DESTINATION MODE.	Check the replica group passed from SRM.
The replication group ReplicaGroupName is in SOURCE MODE.	Check the replica group passed from SRM.
SRA operations failed.	Check SRA services and CV servers.
Could not connect to management server.	Check credentials entered in SRM. Check IP address entered in SRM

Table 1 HP EVA SRA Software version 5.01.00 error and warning messages (continued)

GUI error message	Description/corrective action
Could not retrieve any replication group from source array.	Check the replication group IDs passed from SRM.
The log state after resuming is in Logging.	Although I/O replication has been resumed in the DR group, it is still in a logging state.
Snapshot could not be created for the SourceDevice.	Check whether snapshots can be created for the SourceDevice.
Could not resume replication for replica.	Ensure the replication link between storage subsystems is in a valid state for replication to resume.
Replica is in an invalid state and cannot be resolved.	Ensure the replication groups and storage subsystems are in a valid state for replication.
Could not restore disks in the Replica group.	Ensure that the DR group is in suspended state and any vms on the LUN are shutdown.
All the requested elements could not be retrieved.	Ensure that valid data is sent to retrieve all the components.
Requested arrays were not found.	Check array IDs LocalArrayID and RemoteArrayID passed from SRM; ensure that valid array IDs are sent.
Requested local array was not found.	Check array ID LocalArrayID sent from SRM; ensure that valid array ID is sent.
Requested remote array was not found.	Check array ID RemoteArrayID sent from SRM, ensure that valid array ID is sent.
Requested consistency group was not found.	Check consistency group ID ConsistencyGroupID sent from SRM; ensure that valid consistency group ID is sent.
Requested target group was not found.	Check target group ID TargetGroupID sent from SRM; ensure that valid target group ID is sent.
Requested target group has invalid disk IDs.	Check target group ID TargetGroupID sent from SRM; ensure that valid disk IDs are passed.
Request contains target groups.	This command is not supported for target groups.
Requested consistency group or syncID was not found.	Check consistency group ID ConsistencyGroupID and sync ID SyncID sent from SRM; ensure that valid consistency group ID and sync ID are sent.
The Connection between the Primary Array and Remote Array is lost.	Check the connection link between the Primary Array and Remote Array.
Previously created SRM snapshot for device DeviceName found.	Unexpected snapshot found for DeviceName will be deleted before continuing operation.
Could not create status file.	Check status file path.
Required licenses not installed on array ArrayName.	Check array ArrayName for licenses.
No arrays are configured.	Configure required arrays through storage Administrator portal.
Array ArrayName does not have DR groups with any other array.	Check array ArrayName for DR groups.
Presentation of the device DeviceName to the host HostName has failed on host port HostPort.	Ensure that the ESX server has been zoned and configured correctly with the storage array and that devices can be presented to the host.
The log state is Logging.	Determine whether the link between the local and remote arrays is down or if there is a connectivity error.

7 Support and other resources

Contacting HP

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

Before contacting HP, collect the following information:

- Product model names and numbers
- Service Agreement ID (SAID) that came with your Insight Control license
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

<http://www.hp.com/go/e-updates>

After registering, you will receive e-mail notification of product enhancements, new driver versions, firmware updates, and other product resources.

Documentation feedback

HP welcomes your feedback. To make comments and suggestions about product documentation, send a message to storedocsfeedback@hp.com. Include the document title and manufacturing part number. All submissions become the property of HP.

Related information

The following documents provide related information:

- *HP EVA Continuous Access Software Administrator Guide*
- *HP EVA Business Copy Software Administrator Guide*
- *HP Command View EVA Software User Guide*
- *HP Storage System Scripting Utility Reference*

You can find these documents from the Manuals page of the HP Business Support Center website:

<http://www.hp.com/support/manuals>

Below Storage, click **Storage Software**.

The following book is available on the VMware website:

- *VMware Site Recovery Manager Administration Guide*

NOTE: This document does not describe the operation of related products, including HP EVA Continuous Access Software, HP EVA Business Copy Software, HP Storage Software Scripting Utility, or VMware Site Recovery Manager. For information about these products, see the respective user guides.

HP websites

For additional information, see the following HP websites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- http://www.hp.com/service_locator
- <http://www.hp.com/support/manuals>
- <http://www.hp.com/support/downloads>

Typographic conventions

Table 2 Document conventions

Convention	Element
Blue text: Table 2 (page 40)	Cross-reference links
Blue, underlined text: http://www.hp.com	Website addresses
Blue, underlined, bold text: CVfeedback@hp.com	Email addresses
Bold text	<ul style="list-style-type: none">• Keys that are pressed• Text typed into a GUI element, such as a box• GUI elements that are clicked or selected, such as menu and list items, buttons, tabs, and check boxes
<i>Italic</i> text	Text emphasis
Monospace text	<ul style="list-style-type: none">• File and directory names• System output• Code• Commands, their arguments, and argument values
<i>Monospace, italic</i> text	<ul style="list-style-type: none">• Code variables• Command variables
Monospace, bold text	Emphasized monospace text

HP product documentation survey

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<http://www.hp.com/support/storagedocsurvey>

Thank you for your time and your investment in HP storage products.

A About HP EVA Storage Replication Adapter Software version 5.01.00 for VMware vCenter SRM

HP EVA SRA Software version 5.01.00 is a Storage Replication Adapter (SRA) for use with VMware Site Recovery Manager (SRM). The SRA, developed by HP for EVA storage arrays, enables SRM to work with HP EVA Continuous Access Software array-based replication. HP EVA SRA Software version 5.01.00 is installed on VMware Site Recovery Manager (SRM) servers and enables communications between SRM and HP Command View EVA Software (and HP EVA Continuous Access Software for remote replication).

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Third-party licenses

- "Derby" (page 41)
- "dom4j" (page 45)
- "jBoss" (page 45)
- "jQuery" (page 49)
- "jQuery Plugin Alert Dialogs" (page 49)
- "jQuery Plugin Colsizable" (page 50)
- "jQuery Plugin ColumnManager" (page 50)
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- "SOAP Lite" (page 57)
- "UI Core" (page 59)
- "UI Draggable" (page 59)
- "UI Resizable" (page 60)

Derby

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dom4j

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Glossary

This glossary defines acronyms and terms used in this guide or related to this product and is not a comprehensive glossary of computer terms.

cleanup	<p>Clean up steps are performed after a recovery plan test. The steps begin executing after you have responded to the prompt displayed after the test completes.</p> <ol style="list-style-type: none">1. Power off each recovered virtual machine2. Replace recovered virtual machines with placeholders, preserving their identity and configuration information.3. 3 Clean up replicated storage snapshots that were used by the recovered virtual machines during the test.
device	<p>A storage LUN presented to an ESX server to be used as a datastore or a raw device.</p>
disk array	<p>A RAID. A collection of disk drives within a cabinet or multiple cabinets and including a controller and software allowing drives to be ganged together in various configurations to create virtual drives (LUNs).</p>
DR Group	<p>Data replication group. A logical group of vdisks in a remote replication relationship with a corresponding group on another array.</p>
ESX	<p>VMware ESX and ESXi servers are <i>hypervisors</i> that install on top of a physical server and partition it into multiple virtual machines that can run simultaneously, sharing the physical resources of the underlying server</p>
EVA	<p>HP Enterprise Virtual Array.</p>
failback	<p>Restoring a system back to its original state after a system failure.</p>
failover	<p>When the recovery site takes over operation in place of the protected site after hardware or the entire protected site fails.</p>
HBA	<p>Host Bus Adapter</p>
HP Command View EVA Software	<p>A browser-based interface that allows management of an HP disk array.</p>
LUN	<p>Logical Unit Number. A physically addressable storage unit as surfaced by a hardware RAID subsystem. A vdisk, consisting of multiple portions of physical disks addressed as a single unit.</p>
presentation	<p>The act of making a virtual disk known to a host so that I/O to the disk can occur. When a virtual disk is <i>unpresented</i> from a host, I/O with the disk can no longer occur.</p>
Protected Site	<p>The datacenter containing the protected virtual machines from which data is being replicated to the recovery site.</p>
protection group	<p>A collection of virtual machines and templates. When you create a protection group, it initially contains only those virtual machines that store all of their files on one of the datastore groups associated with the protection group.</p>
RAID	<p>Redundant array of independent disks.</p>
RDM	<p>Raw Device Mapping allows a special file in a VMFS volume to act as a proxy for a raw device. The mapping file contains metadata used to manage and redirect disk accesses to the physical device</p>
recovery plan	<p>A collection of protection groups. A recovery plan specifies how the virtual machines in the protection groups are recovered.</p>
Recovery Site	<p>The datacenter containing the virtual machines that will be recovered and perform work while the protected site is unavailable.</p>
reprotect	<p>Allows you to protect recovered virtual machines after a failover back to the original protected site, including reversing the direction of replication.</p>
snapshot	<p>A generic term meaning a static point-in-time copy of a volume, typically used for backup.</p>
SRM	<p>vCenter Site Recovery Manager</p>

SSSU	HP's Storage Scripting System Utility. The command line interface (CLI) to HP Command View EVA Software.
sync	Synchronous replication.
vdisk	See virtual disk.
virtual disk	<p>HP EVA storage systems use a form of virtualization called virtual disks, or <i>vdisks</i>, to store data. Host computers see virtual disks as real storage objects, exactly they would see physical disks with the same characteristics.</p> <p>Also a VMware term for a virtual hard disk created from a datastore that can be used by a virtual machine.</p>
WWN	A World Wide Name (WWN) or World Wide Identifier (WWID) is a unique identifier for a particular Fibre Channel, Advanced Technology Attachment (ATA) or Serial Attached SCSI (SAS) target. Each WWN is an 8-byte number derived from an IEEE OUI and vendor-supplied information.
zone	See zoning.
zoning	Fibre Channel zoning is the partitioning of a Fibre Channel fabric into smaller subsets to restrict interference, add security, and to simplify management.

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