CA XOsoft™ High Availability for Windows

VMware vCenter Server Operation Guide

r12.5

CA Product References

This document references the following CA products:

- CA XOsoft™ Replication
- CA XOsoft™ High Availability (HA)
- CA XOsoft™ Assured Recovery
- CA XOsoft Continuous Data Protection (CDP)

Contact CA

Contact Technical Support

For your convenience, CA provides one site where you can access the information you need for your Home Office, Small Business, and Enterprise CA products. At http://ca.com/support, you can access the following:

- Online and telephone contact information for technical assistance and customer services
- Information about user communities and forums
- Product and documentation downloads
- CA Support policies and guidelines
- Other helpful resources appropriate for your product

Provide Feedback

If you have comments or questions about CA product documentation, you can send a message to techpubs@ca.com.

If you would like to provide feedback about CA product documentation, complete our short customer survey, which is also available on the CA support website, found at http://ca.com/support.

Note: CA XOsoft is sold in Japan under the names, CA ARCserve Replication and CA ARCserve High Availability.

Contents

Chapter 1: Introduction

CA XOsoft High Availability (HA) is a high availability solution based on asynchronous real-time replication and automated application switchover and switchback to provide cost-effective business continuity for file servers and other application servers on both 32- and 64-bit Windows servers.

CA XOsoft HA offers push-button or fully automatic switchover of mission-critical servers over a LAN or WAN, server status monitoring, and integrated continuous data protection as a guard against data corruption, all in a system that sets the standard for ease of configuration and management.

When disaster strikes, whether in the form of a hurricane, a blackout, or far more likely, a virus attack or software or user error, your ability to respond well to the crisis can make the difference between a bright future and the end of your business. At the very least, you are likely to incur significant costs in lost business and, perhaps more importantly, lost confidence by your customers, investors, and other stakeholders. Disaster recovery planning (DRP) is not just about insurance. It is about maintaining your competitive edge. CA XOsoft HA is designed to give you that edge.

This section contains the following topics:

About This Guide

This document describes how to implement a CA XOsoft HA solution for vCenter. Please review each procedure before you begin. It is essential that you have the appropriate resources and permissions to carry out each task.

Related Documentation

Use this Guide along with the *CA XOsoft Installation Guide* and the *CA XOsoft User Guide*.

Server Requirements

To implement CA XOsoft or CA XOsoft HA, refer to the appropriate list of requirements, depending on the server type you selected. These components are licensed separately. If you do not have the license required to access support for a specific server type, please contact Tech Support.

vCenter Server Configuration Requirements

- Install the same vCenter Server components on the Master to the Replica. Install the CA XOsoft Engine on every vCenter Server.
- Both servers should reside in the same Active Directory forest and be members of the same domain or trusted domains.
- Because Database Server deployment can be distributed, perform one of the following:
  - If Database Server is installed on the same machine as the Master, configure vCenter Server on the Replica to connect to the Database Server on the Replica so that vCenter Server can still use Database Server in the event of a switchover. When the database is installed locally, CA XOsoft HA depends upon the database HA scenario for a successful implementation. Please follow the requirements in the Oracle or Microsoft SQL Operation Guides to ensure database protection.
  - If Database Server is installed on a different machine than Master (distributed deployment), configure vCenter Server on the Replica to connect to the same Database Server to which the Master is connected, so that after a switchover, vCenter Server is still using the original Database Server.

  Note: For distributed database deployment, use CA XOsoft HA for SQL or Oracle to protect it. See the appropriate Operation Guide for more details.
- Because License Server deployment can be distributed, perform one of the following:
  - If License Server (A) is installed on Master, install another instance of License Server (B) on the Replica and specify the B instance as the License Server for the vCenter Server on the Replica.
  - If License Server (A) is installed on a different machine than Master, specify the first instance (A) as License Server for the vCenter Server running on the Replica.

  Note: For distributed License Server deployment, the License Server cannot be protected in CA XOsoft HA scenarios.

Log On Account Conditions

The CA XOsoft Replication and CA XOsoft HA Engine service must satisfy certain account conditions for successful communication with other components. If these requirements are not met, scenarios may not run. If you lack the permissions required, contact your local IS team.

- It is a member of the Domain Admins group. If the Domain Admins group is not a member of the built-in domain local group Administrators you must use an account that is.
- It is a member of the local machine Administrators Group. If the Domain Admins group is not a member, add the account manually.
- For servers in a workgroup, use the Local System account.
- Master and Replica servers must reside in the same Active Directory forest.

Servers Operating in a Workgroup

For servers in a workgroup, set the CA XOsoft Engine service account to Local System (unless you have added any custom scripts that require higher level permissions). Servers in a workgroup can use Redirect DNS only with DNS servers that allow non-secure updates. You can use Move IP, switch computer name, and custom redirection scripts normally.

About Clusters

Installing on clusters is much the same as a standard installation. To configure CA XOsoft HA or CA XOsoft on a cluster, enter the Virtual Server Network Name (or IP Address) resource (in the group you intend to protect) as the Master or Replica name. Do not use node names or IP addresses when configuring the scenario. Also, you must install the CA XOsoft Engine to all cluster nodes (see *Server Setup*).

The only configuration that requires some preparation is the use of IP Move in conjunction with a cluster. For detailed instructions on how to use Move IP with clusters, please see Cluster Move IP.

Note: On Exchange 2007, LCR and SCC deployments are supported, but CCR and SCR deployments are not supported.

License Registration

CA XOsoft licensing policy is based on a combination of several parameters, which include: the operating systems involved, the required solution, the supported application and database servers, the number of participating hosts, and the additional modules - Assured Recovery and CDP Repository. The license key that is generated for you is therefore tailored to your exact needs.

After logging in for the first time, or if your old license has expired, you need to register CA XOsoft product using your license key. To register the product, you need to open CA XOsoft Manager, which does not depend on the existence of a valid registration key. Once the Manager opens, a License Warning message appears, prompting you to register the product. A License Warning message also appears when your license is about to expire during the next 14 days.

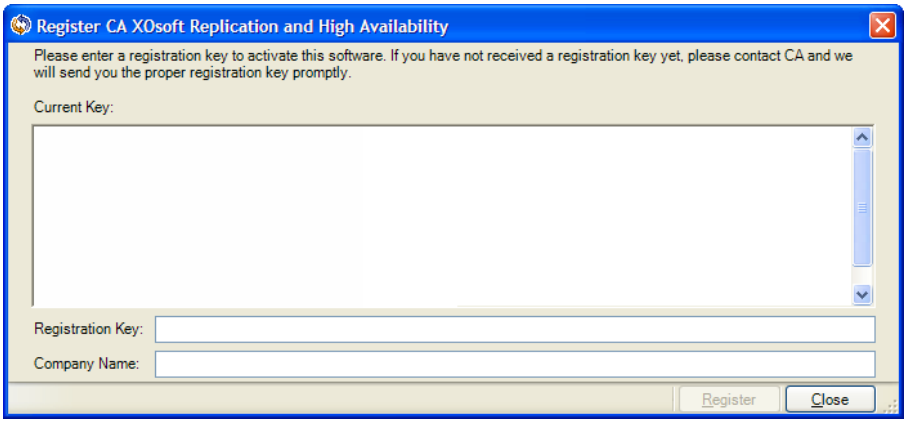
When you are creating a scenario, some of the options might be disabled following the terms of your license. However, you can create as many scenarios as you wish, since the validity of your license key is first checked when you try to run a specific scenario. Only when you click the **Run** button, the system checks whether you are allowed to run the selected scenario according to your license key. If the system determines that you do not have the required license for running this scenario, the scenario will not run and a message will appear on the Event pane informing you of the type of license you need.

To register CA XOsoft using the license key

1. Open the Manager. The **Welcome** message appears. Then, a **License Warning** message appears informing you that your product is not registered and prompting you to register it.

2. Click **OK** to close the message. Then, open the **Help** menu and select the **Register** option.

The **Register CA XOsoft Replication and High Availability** dialog opens.



3. Enter the following information:
   - In the **Registration Key box** - enter your registration key.
   - [Optional] **Company Name** box - enter your company name
4. Click the **Register** button to register the product and close the dialog.

   Now you can start working with the CA XOsoft Manager according to your license permissions.

About Virtualization

Virtual machines make it possible for a single physical computer to be split into logical partitions, each effectively behaving as a separate physical machine, running its own operating system and applications. CA XOsoft supports the following virtual machine applications:

- VMware vCenter Server is a suite of software products that includes the components you need to set up and manage a virtualized environment. It manages one or more vCenter ESX Servers.
- Microsoft Hyper-V Server 2008 is a Windows product that allows you to set up virtual machines on 64-bit Windows Server 2008 systems whose hardware supports virtualization and the Hyper-V role is enabled.

Supported Databases VMware vCenter Server

CA XOsoft supports the following databases when used in a vCenter Server environment:

- Microsoft SQL Server 7
- Microsoft SQL Server 2000
- Microsoft SQL Server 2005
- Oracle 8i
- Oracle 9i
- Oracle 10g

If the vCenter Server Database Server is deployed separately from the vCenter Server, you must create additional scenarios using the appropriate database application type to protect it. Database Servers are protected in vCenter Server scenarios only when deployed on the same machine hosting the vCenter Server.

Note: If you wish to protect MSDE and Microsoft SQL Server 2005 Express, visit the tech support website and download the knowledge document, TEC445313.

Supported Configurations

This section describes the various configuration options available in a virtual environment. Before proceeding, ensure you have read and understood these recommendations.

vCenter Server

vCenter Server consists of the following components:

vCenter Server

This houses the main component that manages the virtualized environment and includes the Web Access Server and License Server. License Server deployment can be distributed or can be installed on the same machine hosting the vCenter Server.

vCenter Server Database

Stores all state information about the VMware Infrastructure. Database deployment can be distributed or can be installed on the same system hosting the vCenter Server.

Infrastructure Servers

Includes Active Directory and DNS. Used by vCenter Server for authentication and address resolution.

Chapter 2: Protecting vCenter Environments

In a vCenter Server environment, several points of failure exist. How much protection you need governs the plan you implement. For example, is local high availability important for network or hardware failure? If yes, then you need to protect the vCenter Server Database. Replicate the vCenter Server Database as part of your disaster recovery plan. (See the appropriate database application Operation Guide for more information.) Is remote disaster recovery important for large-scale outages? If yes, then you need to protect the vCenter Server. Configure two identical servers running vCenter Server.

This section contains the following topics:

VMware vCenter Server HA Configuration

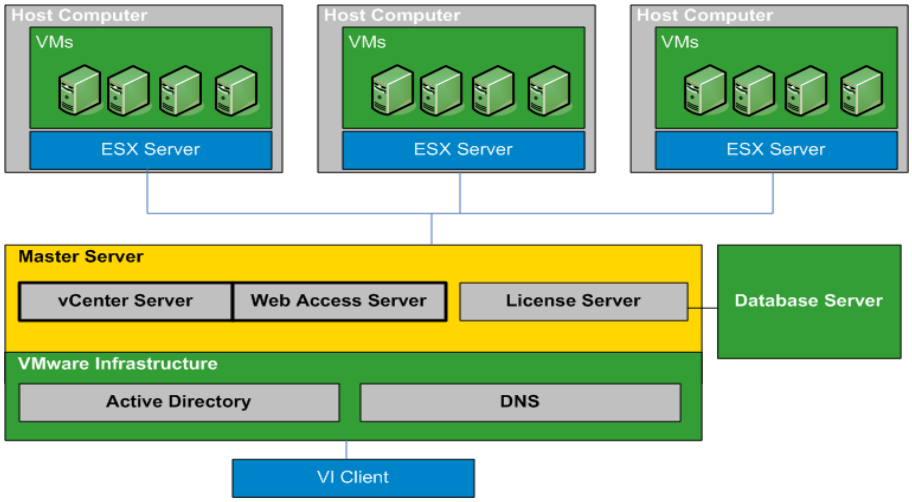
vCenter Server has several components (Database Server, License Server and Web Access Server) that can be deployed to a single machine (local) or in a distributed manner.

The following describes the two main methods of configuring the vCenter Server:

- **Single machine (local) deployment**--the Database Server, vCenter Server, License Server and Web Access Server are all installed on the same machine. If you install these components on the Master server, you must also install them on the Replica server.
- **Distributed deployment--**vCenter Server and Web Access Server are installed on one machine, while the Database Server, the License Server, or both are installed on another. If the vCenter Server machine goes down, the database can still operate. If you use distributed deployment, you must ensure the settings on both the Master and Replica servers both point to the same distributed machine(s).

  Important! Regardless of the method you choose, the vCenter Server and the Web Access Server must be installed on the same machine.

In the following diagram, VMware vCenter Server is configured using the distributed deployment method. The vCenter Server system that houses the vCenter Server and Web Access Server is the Master Server. You must install the CA XOsoft Engine on each vCenter Server in your environment:



Configure the vCenter Server Master Server

Consider the following points when configuring your vCenter Server environment:

- Each ESX server locally stores the IP address of the vCenter Server managing it. This address must be changed to the standby server in the event of a switchover. We recommend using the vCenter Server Managed IP Address setting to automate switchover.
- Each ESX server can be managed by only one vCenter Server. Connecting an ESX server to more than one vCenter Server automatically disconnects it from its original server.

When you configure CA XOsoft on the vCenter Server Master Server, enter the same IP address you entered in the Managed IP Address field as the IP Mask field on the High Availability Properties screen.

If you do not use the Managed IP Address setting, you must manually reconnect all ESX servers to the standby vCenter Server after switchover.

To configure the vCenter Server Master server

1. Add another IP address to the Master server network interface card (NIC). For more information, refer to the topic, Add IP on the Master Server.
2. From the vCenter Server Runtime Settings screen, set the Managed IP address field to the same IP address you added in Step 1, not the Master server's IP address. For more information, refer to the VMware vCenter Server documentation.
3. Run the HostReconnect script to reconnect all ESX servers managed by the vCenter Server. Download this script from the VMware website.

Important! When you create HA scenarios, we recommend that you enable the Move IP redirection method on the Switchover Properties screen. If you enter additional IP addresses to the Master Server NIC, Move IP is enabled by default.

Configure the vCenter Server Replica Server

To enable high availability scenarios, you need to set up a Replica server identically to the Master.

To set up vCenter Server for high availability, configure a Replica server as follows:

- Install the same vCenter Server components that exist on the Master. Ensure the Replica has the same database type as the Master. You should also use the same folder structure on both servers.
- Configure the Database Server on the Replica according to the vCenter Server configuration method you used. Fore more information, see Configure the vCenter Server Database Server. (see page 17)
- Configure the License Server on the Replica according to the vCenter Server configuration method you used. For more information, see Configure the vCenter Server License Server. (see page 18)

  Note: To protect the distributed (remote) database servers, create separate scenarios with CA XOsoft HA SQL or CA XOsoft HA Oracle, as appropriate. However, if the License Server is deployed separately, CA XOsoft cannot protect it.

Configure the vCenter Server Database Server on the Replica

In the event of a failure, access to the Database Server is essential to a vCenter Server high availability scenario.

To configure the vCenter Server Database Server on the Replica server

Do one of the following, depending on how your environment is configured:

- If you used single machine (local) deployment, configure the ODBC settings as follows:

  1. Install the Database Server on the Replica. Specify this instance on the Replica so that the Replica uses its local Database Server.
  2. Ensure the Database Server Instance Name is the same as the one specified on the Master
  3. Ensure the Database Name is the same as the one specified on the Master
  4. Ensure the Database Server installation path and db files path are the same as those specified on the Master

Or:

- If you used distributed deployment, configure the ODBC settings as follows:

  1. Do not install the Database Server on the Replica. Instead, specify the same remote Database Server that is specified on Master.
  2. Specify the same data source name (DSN) as on the Master. To do this, select Use an existing database server from the VMware vCenter Server Deployment Options - Step 1 screen and then enter the name of an already-configured DSN. Click No when asked if you wish to reinitialize the database and start over with a blank configuration.

Configure the vCenter Server License Server on the Replica

In the event of a failure, access to the License Server is also essential to a vCenter Server high availability scenario.

To configure the vCenter Server License Server on the Replica server:

Do one of the following:

- If you used single machine (local) deployment:
  1. Install the License Server on the Replica.
  2. Replica uses its local License Server. From the VMware vCenter Server Deployment Options-Step 2 screen, choose Use an Existing License Server.
  3. Specify the Replica License Server and port number in the text field.

Or:

- If you used distributed deployment:
  1. You do not need to install the License Server on the Replica.
  2. From the VMware vCenter Server Deployment Options-Step 2 screen, choose Use an Existing License Server
  3. Specify the same remove License Server that is specified on the Master in the text field.

vCenter Server VM Auto-Discovery

When you create a vCenter Server scenario, the CA XOsoft Engine collects the following information:

vCenter Server Configuration file

Used by the vCenter Server Service for managing virtual machine settings.

SSL Certificate

Used by the vCenter Server Service for authentication purposes and for encrypting the Database password so hosts can be reconnected after switchover.

Upgrade files

Used by the vCenter Server when ESX servers are added.

Flex License files

Used by the License Server to control license of vCenter Server access

Database files

Used by the Database Server to store all state information.

Chapter 3: Redirection Methods

This section contains the following topics:

How Redirection Works

Each of the server types supported by CA XOsoft can be configured to use one or more redirection methods. You should enable redirection methods based on your environment and business needs. The supported redirection methods for vCenter follow:

DNS Redirection

DNS Redirection changes the DNS "A" Record of the Master server to resolve to IP address of the Replica server. Upon failure of the Master, the Replica server modifies the appropriate DNS record so that references to the Master server resolve to the Replica's IP address rather than the Master's IP address. This redirection method requires no network reconfiguration and works in LAN and WAN network configurations.

DNS redirection works only with A (host) type records and cannot update CNAME (Alias) records directly. However, if the CNAME record points to the modified A record, it is indirectly redirected.

Using the record that has the Master server's name is the default, however you can configure CA XOsoft HA to redirect any DNS A (host) record via the *Master's name in DNS* setting in the switchover properties tab.

Move IP Redirection

Move IP redirection involves moving the Master server IP address to the Replica server.

This redirection method is preferred for Virtual Machine scenarios and is usable only in a LAN configuration in which the Master and Replica servers reside in the same network segment. In this configuration, switchover of the Master server causes the Replica to take over one or more of the IP addresses assigned to the Master server.

Important! Use this method only when both servers are on the same IP subnet.

When using Move IP as the redirection method, you must first add IP addresses to the Master host. For more information, refer to the topic, Add IP on the Master Server.

Add IP on the Master Server

You need to add an additional IP address to the Master host, (which is denoted as *XO-IP* in the following steps) to use Move IP redirection in your HA scenarios. This new IP address is used for CA XOsoft internal communication and replication. This is necessary because once switchover occurs, the current production IP address is no longer available on the Master -- it switches to the Replica server.

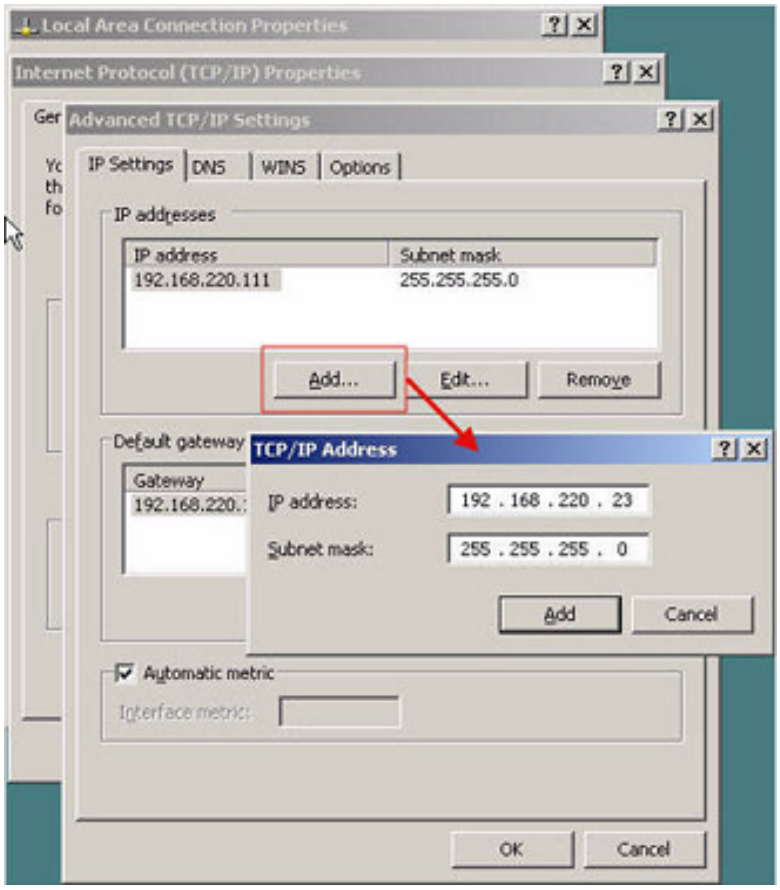
Important! Perform the following only if you are using the Move IP redirection method.

Add IP Address to Master Server

1. Open the Control Panel and choose Network Connections.
2. Right-click Local Area Network and choose Properties.
3. Click Internet Protocol (TCP/IP) and then click the Properties button.
4. Click Advanced.

5. Click Add and enter an additional IP address (XO-IP).

   In the following screenshot, the XO-IP IP address is 192.168.220.23 and the current production server IP address is 192.168.220.111.



6. Click Add.
7. Click OK.
8. Click OK to exit the LAN settings.

After you add the IP to the Master, you must add the XO-IP to your HA scenarios. There are two ways to add the XO-IP address to an HA scenario:

- For new scenarios, from directly in the Wizard
- For existing scenarios, by modifying the master host name

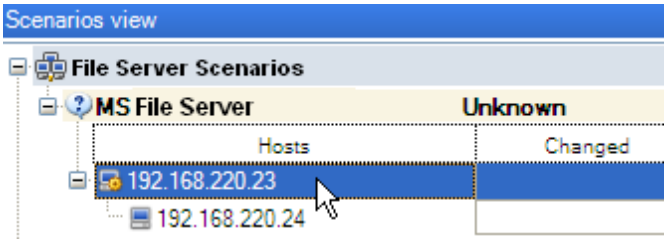
The procedures for both ways follow.

Add XO-IP to Existing Scenarios

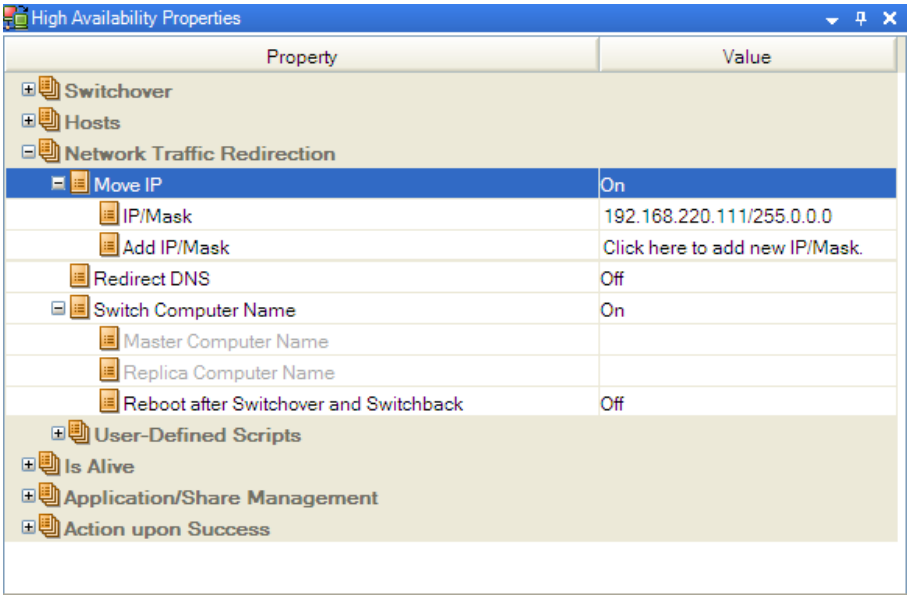
Perform this procedure only if you are using the Move IP redirection method.

To add the XO-IP to existing scenarios:

1. On the Scenario pane, select the required Master host.



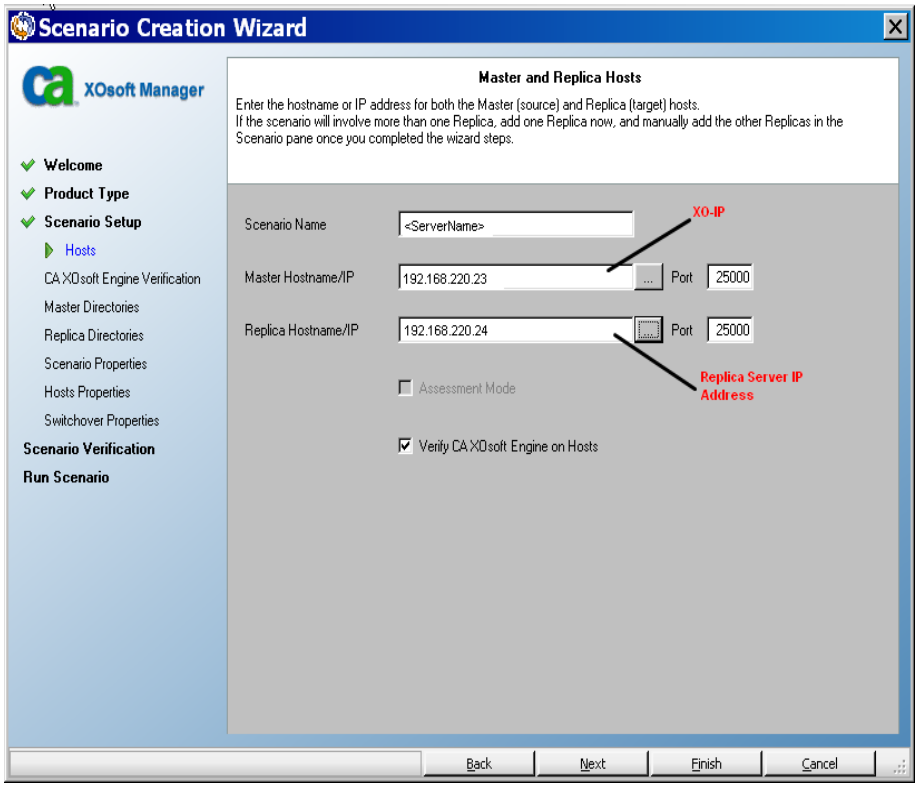
2. Right-click the Master and select **Rename** from the pop-up menu. Then, enter the XO-IP address.
3. On the Framework pane, select the **Switchover** tab and then select the Replica server as the switchover host.
4. Set the **Move IP** option to On. Ensure that the IP address under **Move IP**, **IP/Mask** matches the production server IP address: this is the IP address that will switch over. If you are moving more than one IP address you can add multiple production IP addresses by selecting **Click here to add new IP/Mask.**



Add XO-IP to New Scenarios

Perform this procedure only if you are using the Move IP redirection method.

During the initial run of the Scenario Creation Wizard, enter the XO-IP and Replica IP addresses instead of the server names.



Switch Computer Name Redirection

If you are redirecting File Shares, in which clients connect via the Master server name, enable switch computer name. For example, if the Master server name is fs01 and clients connect to \\fs01\sharename or \\fs01.domain.com\sharename, using the Switch computer name method redirects clients to the failover server.

It's also recommended to enable one other method as well. The most common method is to use both DNS Redirection and Switch Computer Name. CA XOsoft HA makes the required computer name switch by assigning a temporary name to the Master server and taking over its computer name for use with the Replica server.

CA XOsoft HA updates records directly and does not generally require a reboot. If, however, you encounter any problems after switchover, consider setting the reboot option to On and testing again.

Note: For Windows Server 2008 systems, you must reboot the machine after a switchover occurs when the switch computer name method is used. We recommend setting the Reboot After Switchover and Switchback property to On when using this method.

Automatic Redirection Using Switch Computer Name

When possible during switchover, CA XOsoft HA renames the master host to *masterhostname-XO* and assigns its original name to the replica server. This step prevents name conflicts since the master's name is now assigned to the replica server. In this graceful case, if automatic reverse replication is set to on, CA XOsoft starts the backward scenario automatically. If automatic reverse replication is set to off, run the scenario again manually by selecting the Run button or choosing *Run* from the Tools menu. Once the backward scenario has run and synchronization is complete you can click the Perform Switchover button to switch back.

Scripts Redirection

Custom Scripts: CA XOsoft HA can trigger custom scripts or batch files to perform the user redirection or any additional steps not covered by built-in methods. If the above methods are not appropriate or do not fully meet all requirements, please see the *CA XOsoft User Guide* for details on scripted redirection methods.

Because of the different ways in which a vCenter Server environment can be configured, redirection must ensure that the vCenter Server, Web Access, Database, and License Servers can all be accessed in the event of a failure. We recommend that you use the vCenter Managed IP feature. If the IP address of a vCenter Server system changes, the managed hosts connected to it are automatically reconnected if you use this feature.

If you are using this redirection method	Under this condition	Perform this task
Switch Computer Name	If you are using SQL Server as the database and the Database Server is on the Master...	...no additional action is needed. Auto Configure changes the ODBC setting on the Replica to the database server local to the Replica.
	If you are using Oracle as the database and the Database Server is on the Master...	...no additional action is needed.
	If the Database Server (SQL or Oracle) is on a remote machine...	...no additional action is needed.
	If the License Server is on the Master...	...change the License Path on the Replica to point to the local Replica License Server in registry: HKEY_LOCAL_MACHINE\SOFTWARE\VMware, Inc.\VMware vCenter Server key value: "LicensePath"="xxxxx@localhost"
	If the License Server is on a remote machine...	...no additional action is needed.
Move IP Address	If you are using the IP address to access vCenter Server...	...no additional action is needed. Auto Configure changes the path to the License Server in the registry.
DNS	If you are using the hostname to access the vCenter Server...	...enable the DNS redirection mode.

Chapter 4: Creating and Using Scenarios

This section describes how to create and use high availability scenarios.

This section contains the following topics:

Create New vCenter HA Scenario

To create a new vCenter Server HA scenario

1. Open the CA XOsoft Manager and click Scenario, New or click the New Scenario button.

   The Welcome dialog opens.

2. Choose Create a New Scenario and select a Scenario Group from the list. Click Next.

   The Select Server and Product Type dialog opens.

3. Choose VMware vCenter Server, High Availability Scenario (HA) and click Next.

   The Master and Replica Hosts dialog opens.

4. Type a Scenario Name, enter the Hostname or IP Address and Port number for both the Master and Replica servers, enable the Verify Engine on Hosts option, and then click Next.

   Wait while Engine Verification completes. If prompted for logon credentials, enter them and click OK.

5. If necessary, click Install to upgrade the Engine service on one or both Servers. If you are prompted for logon credentials, enter them and click OK. When installation completes, verify again and then click Next.

   Note: If you are using a local Oracle instance as the vCenter database, you are now prompted for logon credentials. Enter the Oracle DBA name and password now and click OK to start auto-discovery.

   The Database for Replication dialog opens and displays the auto-discovered results for the host you specified as the Master. For SQL Server, all databases used by vCenter are replicated by default.

6. Clear checkmarks next to the databases you do not want to replicate, if desired, and click Next.

   The Replica Configuration dialog opens. CA XOsoft HA automatically compares Master and Replica configurations, ensuring they are identical.

7. Resolve errors, if any are displayed and then click Next.

   The Scenario Properties dialog opens.

8. Configure additional properties, if desired, and click Next. For more information, see Scenario Properties or the User Guide.

   The Master and Replica Properties dialog opens.

9. Make changes, if desired, and click Next. For more information, see Scenario Properties or the User Guide.

   Wait while the Switchover Properties dialog retrieves information.

10. Configure the desired redirection properties, and click Next. For vCenter HA scenarios, Move IP is automatically set to On. For more information, see Switching Over and Switching Back.

    The Switchover and Reverse Replication Initiation dialog opens.

11. Choose automatic or manual switchover, and automatic or manual reverse replication, as desired, and click Next. You should not set both of these options to Automatic. For more information, see Scenario Properties or the User Guide.

12. Wait while Scenario Verification completes. Problems are reported in the dialog. You must resolve errors and should resolve any warnings before running the scenario. When scenario verification is successful, click Next.

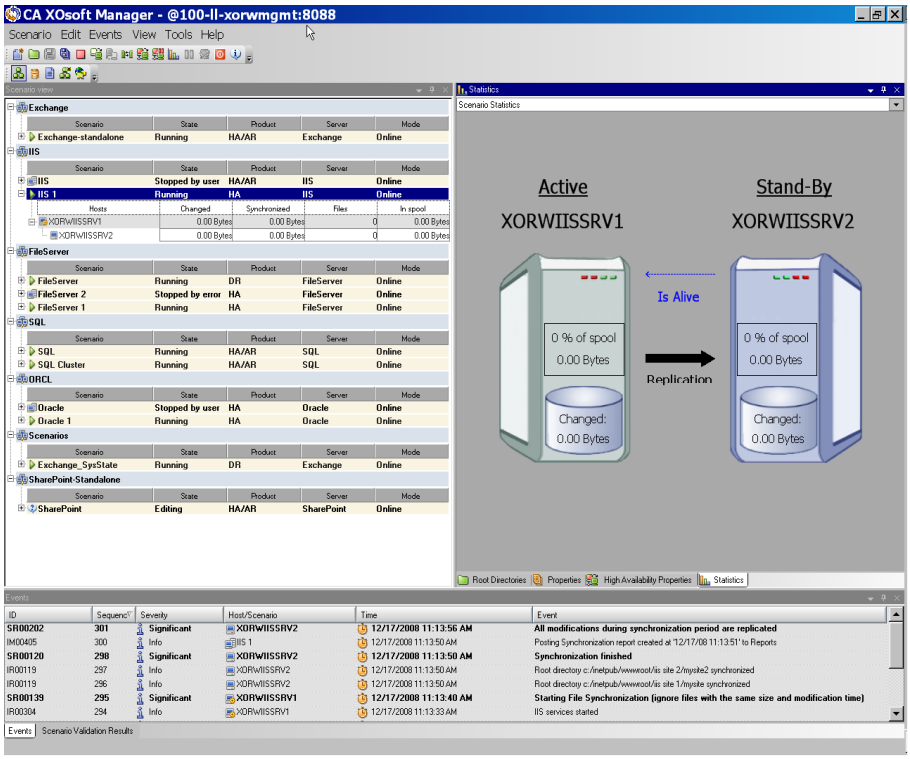
13. Choose Run Now to start synchronization or Finish to save the scenario and run it later. For more information, see Run the Scenario from Outside the Wizard.

Scenario Properties

If you wish to change a scenario configured through the Wizard or configure additional settings, you can use the Properties pane to modify the scenario.

The Properties pane and its tabs are context-sensitive and change whenever you select a different node from a scenario folder. You must stop a scenario before configuring its properties. Certain values cannot be modified once set; they are noted. For full details on configuring scenario properties and their descriptions, see the CA XOsoft User Guide.

Properties are organized into tabs on the CA XOsoft Manager Framework pane. The tabs displayed are based upon server type, CA XOsoft solution, and scenario status. Select the scenario for which you wish to change properties, and then select the appropriate tab. The following screen shows an IIS scenario as an example:



Settings on the Root Directories tab

Select a Master Server from the Scenario Pane. Double-click its Directories folder to add or remove Master Root Directories. Select or clear checkboxes next to folders, as desired, to include or exclude them. You may also edit directory names.

Select a Replica Server from the Scenario Pane. For each Master Root directory, you must specify a Replica Root directory. Double-click the Directories folder for the Replica server. Select or clear checkboxes next to folders, as desired, to hold the corresponding Master directory.

Settings on the Properties Tab

Scenario Properties

These settings establish default behavior for the entire scenario.

- General properties -- cannot be changed once created
- Replication properties -- choose the replication mode (Online or Scheduled), synchronization values (File or Block, Ignore Files of Same Size/Type) and optional settings (Replicate NTFS Compress Attribute, Replicate NTFS ACL, Synchronize Windows Shares, Prevent Automatic Re-sync upon Error)
- Event notification properties -- specify a script to run, choose email notification, or write to event log.
- Report Handling -- specify report settings, email distribution or script execution

Master and Replica Properties

These settings establish server properties on both Master and Replica. Some settings vary by server type.

- Host connection properties -- Enter the IP address, Port number and Fully Qualified Name of the Master and Replica
- Replication properties -- These properties differ for Master and Replica. See the CA XOsoft User Guide for more information.
- Spool properties -- Set the size, minimum disk free size and directory path. See Spool Directory Settings (see page 56) for more information.
- Event notification properties -- specify a script to run, choose email notification, or write to event log.
- Report properties -- choose synchronization or replication reports, specify distribution or script execution
- (Replica) Scheduled Tasks -- set or suspend tasks, including Replica Integrity Testing for Assured Recovery. For more details, see the CA XOsoft User Guide.
- (Replica) Recovery properties -- set delay, data rewind properties, or scheduled task for replica.

Settings on the HA Properties Tab

These settings control how switchover and switchback are performed

- Switchover properties -- choose automatic or manual switchover, provide switchover hostname, and reverse replication settings
- Hosts properties -- specify the Master and Replica Fully Qualified Name
- Network Traffic Redirection properties -- choose Move IP, Redirect DNS, Switch Computer Name or User-defined scripts.

  Note: Network Traffic Redirection does not apply to Hyper-V HA scenarios.
- Is Alive properties -- set the heartbeat frequency and check method
- DB Management properties (does not apply to File Server scenarios) -- instructs CA XOsoft to manage shares or services on a database server
- Action upon Success properties -- defines custom scripts and arguments for use

Run the Scenario from Outside the Wizard

After you create a scenario, you need to run it to start the replication process. Normally, before data changes on the Master will begin to be replicated on the Replica, the Master and the Replica need to be synchronized. Therefore, the first step in initiating a replication is synchronizing the Master and Replica servers. After the servers have been synchronized, online replication starts automatically, continuously updating the Replica with all of the changes that occur on the Master.

Note: In order for the replication process to succeed, verify that the user under which the CA XOsoft Engine is running has Read permission on the Master, and Read and Write permissions on each replication root directory and included files, and on all participating Replica hosts.

To run the scenario from outside the wizard

1. From the Scenario pane, select the scenario you want to run.
2. Click **Run**  on the Standard toolbar.

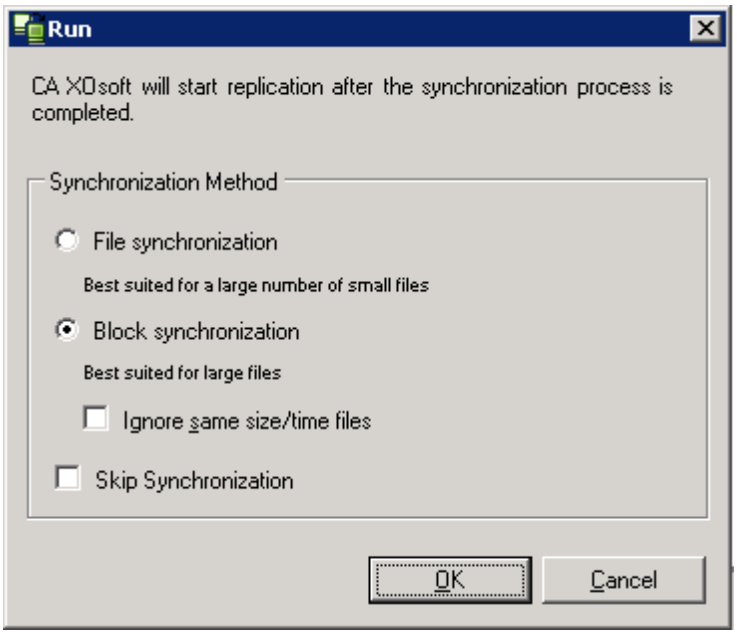
   Before initiating synchronization and replication, CA XOsoft verifies your scenario configuration. When verification completes successfully, CA XOsoft Manager displays the message: *Are you sure you want to run scenario "scenario_name?"* If problems are discovered, the top pane displays any warning and error messages resulting from verification.

Note: Scenario Verification checks many different parameters between the Master and Replica servers to ensure a successful switchover. If any errors or warnings are reported you should not continue until they are resolved.

3. Correct errors before you continue. Errors are reported on the Event pane.

   Note: Replication of mount points succeeds only if those were added to the Master before the Engine was started. If you included the mount points in the Master root directories when the Engine was already running, no error is reported but the replication does not start. In this case, you need to restart the Engine on the Master before initiating replication.

   When no error is reported, the **Run** dialog appears and contains synchronization options.



   Note: Do not use Skip Synchronization for any scenarios replicating a database.

4. If you have a large number of small files, select File Synchronization. If you have large files, select Block Synchronization. Select the Ignore same size/time files to skip the comparison of files with the same path, name, size and modification time, which are generally identical, to reduce synchronization time. You should enable the Skip Synchronization option only when you are certain the files on both Master and Replica are identical. The default selections are File Synchronization and Ignore files of same size/time option enabled.

5. Click the **OK** button. Synchronization may take a while, depending on database size and network bandwidth between the Master and Replica. You will receive the following message in the event window when the synchronization is complete: *All modifications during synchronization are replicated.*

At this point, the scenario is operational and active. By default, a Synchronization Report is generated when synchronization finishes. To view the report, refer to the topic, View a Report. You can also generate regular Replication Reports to monitor the replication process on each participating server. For more information, see the *CA XOsoft User Guide*.

Stop a Scenario

To stop a scenario

1. From the Scenario pane, select the scenario you want to stop.
2. To stop the scenario, click the **Stop** button on the Standard toolbar.

   A confirmation message appears prompting you to approve the scenario stopping.
3. Click **Yes** in the confirmation message. The scenario stops.

   After stopping the scenario, the Manager no longer shows the green play symbol to the left of the scenario, the scenario's state turns into **Stopped by user**, and the Statistics tab is no longer available on the Framework pane.

View a Report

CA XOsoft can generate reports on the replication and synchronization processes. These reports can be stored on your desired location, opened for view from the Report Center, sent by email to a specified address, or they can trigger script execution.

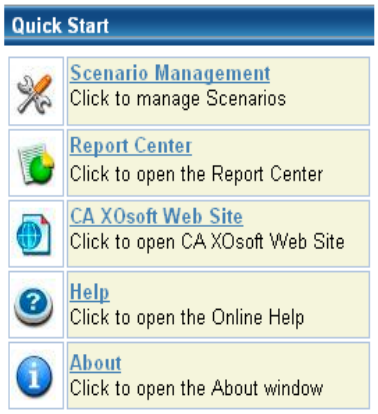
The default storage directory of the generated reports is:
[ProgramFilesFolder]\CA\XOsoft\Manager\reports

To view a report

Note: Though an Exchange report is shown for illustrative purposes, the steps and screens are similar regardless of scenario type.

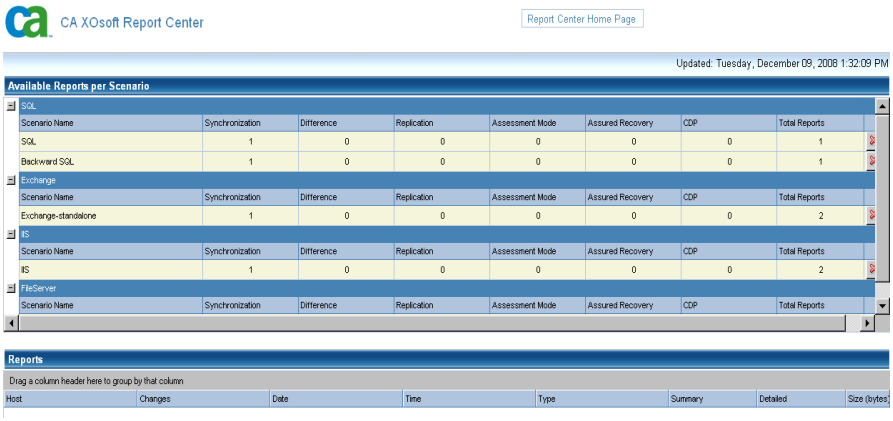
1. To view a report, first you need to open the Report Center. There are two ways to open it:

   - On the Overview Page, click the **Report Center** link on the **Quick Start** pane on the left:



2. From the **Tools** menu, select the **Reports** option and then **Show Scenario Reports**.

   The Report Center opens in a new window:



   The Report Center consists of two tables:

   - The upper table - **Available Reports per Scenario** - contains a list of all scenarios that have reports, along with the type and number of available reports for each scenario.
   - The lower table - **Reports** - contains a list of all the reports that are available for the scenario selected in the upper table.

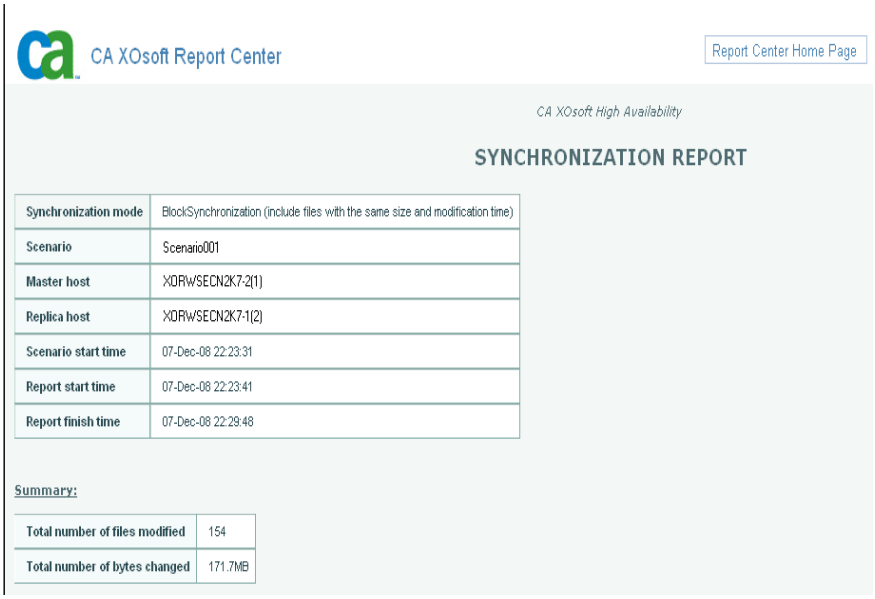
3. To view a specific report, select from the **Available Reports per Scenario** table the scenario that this report represents. Then, from the **Reports** table below, click the report you want to open:

Drag a column header here to group by that column

Host	Changes	Date	Time	Type	Summary	Detailed	Size (bytes)
XORWEXCH2K7-1	UnKnown	Today	03:29:37	Assured Recovery			811
XORWEXCH2K7-1	Changes found	12/07/08	22:29:48	Synchronization			28415

Note: Depending on your settings, for Synchronization and Replication reports a **Detailed** report can be generated in addition to the **Summary** report. Both reports represent the same process, but the **Detailed** report also provides a list of the files that participated in the process.

The report you selected appears in a new window:



CA XOsoft Report Center

Report Center Home Page

CA XOsoft High Availability

SYNCHRONIZATION REPORT

Synchronization mode	BlockSynchronization (include files with the same size and modification time)
Scenario	Scenario001
Master host	XORWSECN2K7-2(1)
Replica host	XORWSECN2K7-1(2)
Scenario start time	07-Dec-08 22:23:31
Report start time	07-Dec-08 22:23:41
Report finish time	07-Dec-08 22:29:48

Summary:

Total number of files modified	154
Total number of bytes changed	171.7MB

Chapter 5: Switching Over and Switching Back

Switchover and *Switchback* is the process in which active and passive roles are exchanged between the Master and Replica servers, so that if the Master is currently active, it changes to passive after Switchover passes the active role to the Replica. If the Replica is active, it changes to passive after Switchover passes the active role to the Master. Switchover can be triggered at the push of a button or automatically by CA XOsoft HA when it detects that the Master is unavailable, if you enabled the Perform Switchover Automatically option from the Switchover and Reverse Initiation dialog. When this option is Off, the system notifies you that the Master server is down so you can manually initiate switchover from the CA XOsoft Manager.

This section contains the following topics:

How Switchover and Switchback Work

After the HA scenario starts running and the synchronization process is completed, the Replica checks the Master on a regular basis, by default every 30 seconds, to see if it is alive. The following types of monitoring checks are available:

- **Ping** -- a request sent to the Master to verify that the Master is up and responding
- **Database check** -- a request that verifies the appropriate services are running and all databases are mounted
- **User-defined check** -- a custom request you can tailor to monitor specific applications

If an error occurs with any part of the set, the entire check is considered to have failed. If all checks fail throughout a configured timeout period (by default, 5 minutes), the Master server is considered to be down. Then, depending on the HA scenario configuration, CA XOsoft HA sends you an alert or automatically initiates a switchover.

When you created an HA scenario, you defined how you want the switchover to be initiated.

- If you selected the Initiate Switchover manually option from the Switchover and Reverse Replication Initiation page, perform a manual switchover. For more information, refer to the topic, Initiate Switchover (see page 41).
- If you selected the Initiate Switchover automatically option, you can still perform a manual switchover, even if the Master is alive. You can initiate switchover when you want to test your system, or you want to use the Replica server to continue the application service while some form of maintenance is performed on the Master server. Triggered (automatic) switchover is in all ways identical to manual switchover performed by the administrator, except it is triggered by a resource failure on the master server rather than by an administrator manually initiating the switchover by clicking the Perform Switchover button. The timeout parameters are configurable and are more extensively covered in the *CA XOsoft User Guide.*

When you created an HA scenario, you defined how you want the reverse scenario to be initiated.

- If you selected the Initiate Reverse Replication automatically option from the Switchover and Reverse Replication Initiation page, replication in the reverse direction (from Replica to Master) automatically begins after a switchover has finished successfully.
- If you selected the Initiate Reverse Replication manually option, you must resynchronize data from Replica to Master, even after testing a clean switchover without a Master failure.

When the Reverse Replication feature is off, to start reverse replication after a switchover has occurred, click the Run button. The benefit to this feature is, if both the master and replica servers were online and connected during switchover, resynchronization in the reverse direction is not required. Resynchronization involves comparing the data on the master and replica servers to determine which changes to transfer before real-time replication starts; this can take some time. If automatic reverse replication is turned on, and both servers were online during switchover, replication is reversed without the need for resynchronization. This is the one situation in which resynchronization is not required.

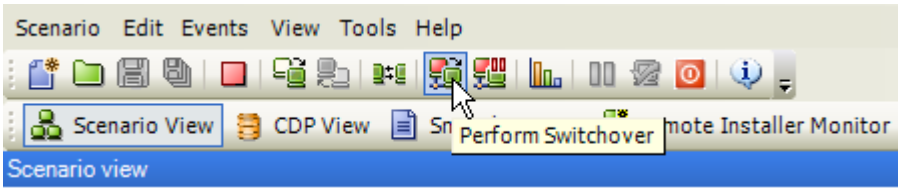
Initiate Switchover

Once triggered, whether manually or automatically, the switchover process itself is fully automated.

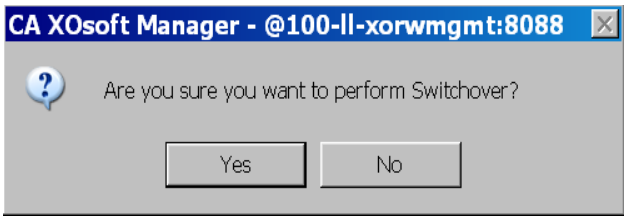
Note: Though the following steps show Exchange scenario screens as examples, the procedure is similar for all server types.

To initiate manual switchover

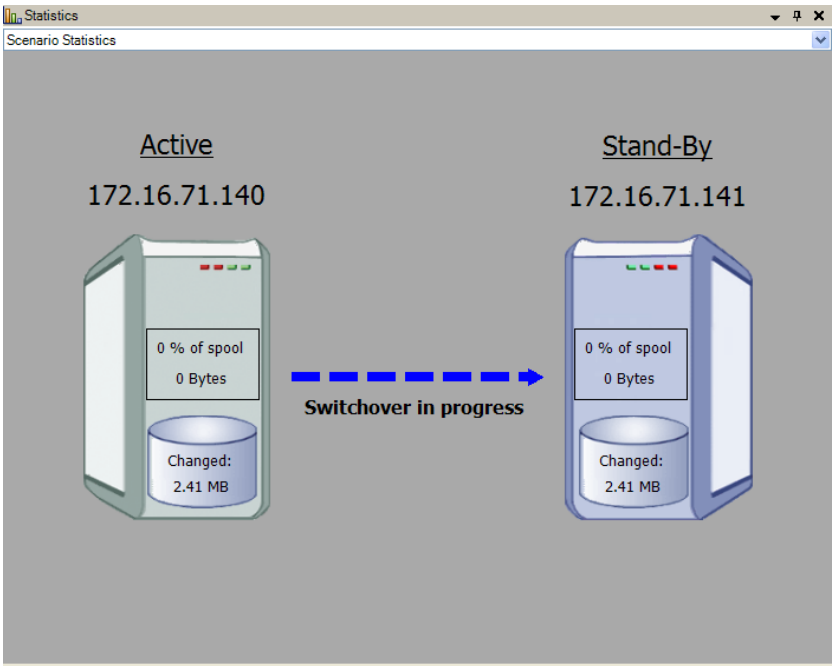
1. Open the Manager and select the desired scenario from the Scenario pane. Verify it is running.
2. Click on the **Perform Switchover** button, or select from the **Tools** menu the **Perform Switchover** option:



A confirmation message appears:

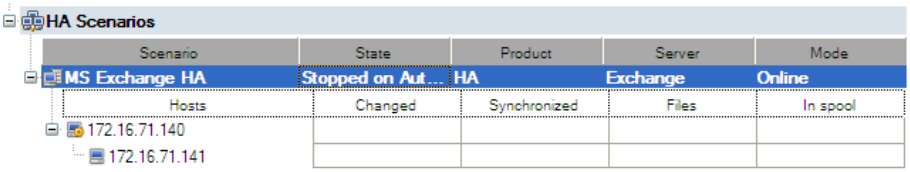


3. Click **OK** on the **Perform Switchover** confirmation message. This procedure initiates a switchover from the Master server to the Replica server:



Detailed information about the switchover processes is located in the Events pane during switchover.

4. After the switchover is completed the scenario stops:



Note: The only case in which the scenario may continue to run after switchover is when **automatic reverse replication** is defined as **Start automatically**.

In the Event pane a message appears, informing you that **Switchover completed**, and then that the **Scenario has stopped**.

Now, the Master becomes the Stand-by server and the Replica becomes active server.

Initiate Switchback

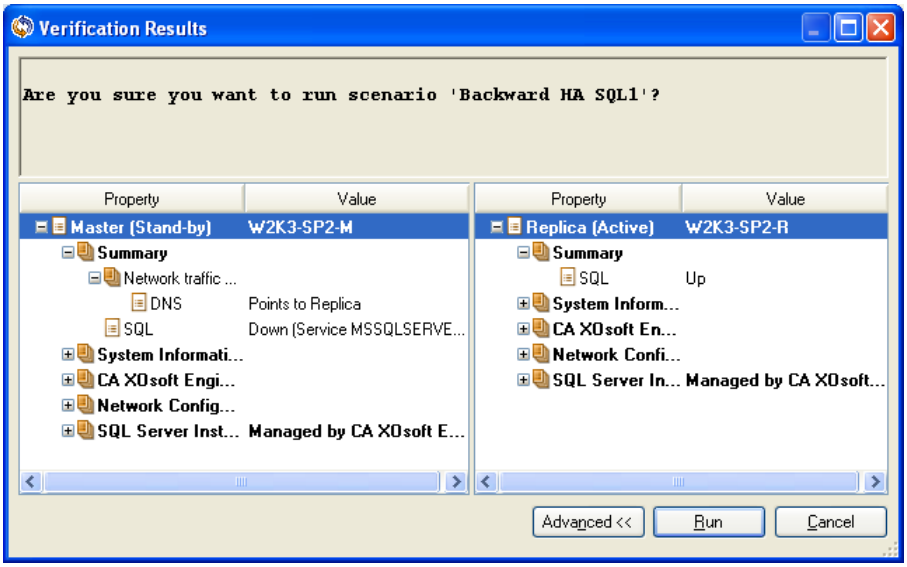
After a switchover is initiated, whether manually or automatically, at some point, you will want to reverse the server roles and make the original Master the active server again the Replica the standby server. Before you switch back the roles between servers, decide if you want to the data on the original Replica server to overwrite the data on the original Master. If yes, you must first perform a reverse scenario, called a backward scenario.

Note: The following steps are the same regardless of server type.

To initiate manual switchback

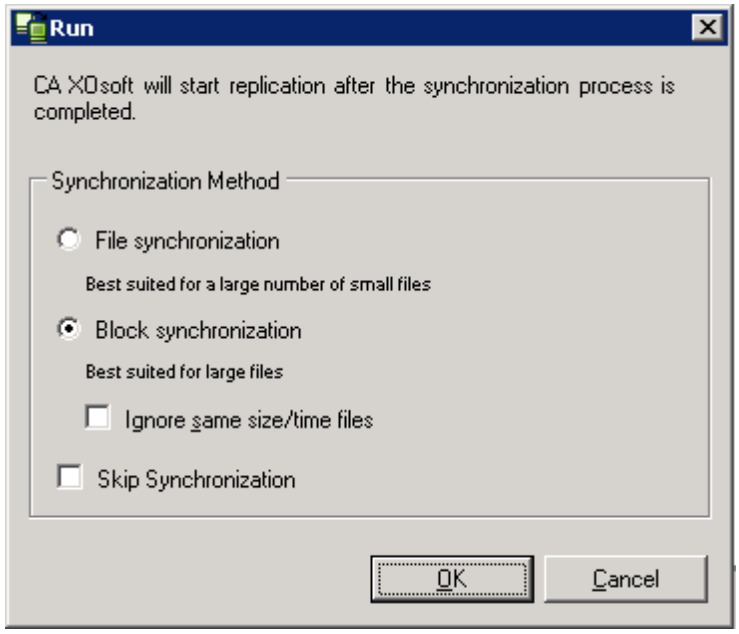
1. Ensure that both Master and Replica servers are available on the network and that the CA XOsoft Engine is running.
2. Open the Manager and select the desired scenario from the Scenario pane.
3. Perform one of the following:
   - If the scenario is already running, skip directly to Step 4
   - If the scenario is not running, perform these steps and then go to Step 4:
     a. Click Run on the toolbar to start the scenario.

     CA XOsoft HA detects that a switchover has occurred and verifies its state and configuration. After verification completes, the Verification Results dialog appears, listing existing errors and warnings if detected, and prompting you to approve the running of the backward scenario. If desired, click the Advanced button to open an additional pane with detailed information about the hosts that participate in the scenario.

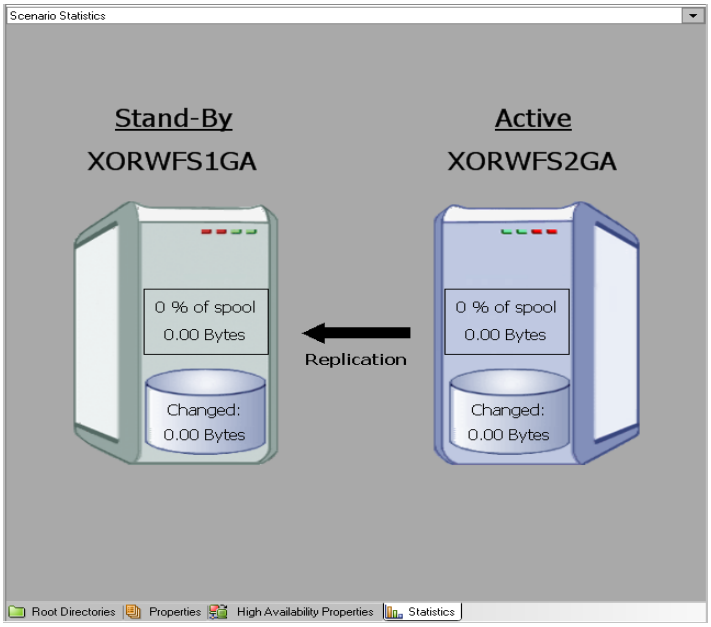


b. Select a synchronization method from the Run dialog and click OK to start resynchronization.

Note: See the CA XOsoft User Guide for more information on Synchronization Methods.



After resynchronization completes, you receive a message in the Event pane: All modifications during synchronization period are replicated. Now, replication from the active server to the standby server begins:



Note: You are now ready to reverse the roles between the Master and Replica servers.

4. Click Perform Switchover on the toolbar while the scenario is running to reverse the server roles. A confirmation message appears.
5. Click Yes to clear the message and start the switchback process.

   After the switchback is completed, the server roles are reversed back and the scenario automatically stops.

   Note: The scenario will continue to run after the switchback when the Reverse Replication Initiation option is defined as Start Automatically.

You may now run the scenario again in its original (forward) state.

Switchover Considerations

It is not recommended to set both the Switchover and Reverse Replication Initiation options to automatic in a production environment. While these options are individually beneficial it is best practice to set only one or the other to automatic. The reason for this recommendation is that automatic switchover allows CA XOsoft HA to trigger a switchover, after a failure is detected, without administrative involvement. If automatic reverse replication is also on, CA XOsoft HA may start to overwrite data on the failed production server before an administrator is able to assess the failure situation. Overwriting data on a failed server before an administrator can assess the situation may have undesirable consequences. Due to this possibility, setting both options to automatic is not recommended. Please choose either one or the other depending on what best fits your requirements. When only one option is used at a time these settings can be very beneficial and may be used safely.

Chapter 6: Recovering Data

This section contains the following topics:

The Data Recovery Process

When an event causes loss of Master data, the data can be restored from any Replica. The recovery process is in fact a synchronization process in the reverse direction - from a Replica to the Master.

CA XOsoft enables you to recover data in two ways:

- Recover lost data from the Replica to the Master -- this option is a synchronization process in the reverse direction and requires you to stop the scenario. (This option is not recommended for Oracle, SQL or Exchange scenarios.)
- Recover lost data from a certain event or point in time (Data Rewind) -- This option uses a process of stamped checkpoints and user-defined bookmarks to roll corrupt data on the Master back to a time before corruption occurred.

Important! You must stop replication in order to initiate recovery.

Recover Lost Data from Replica

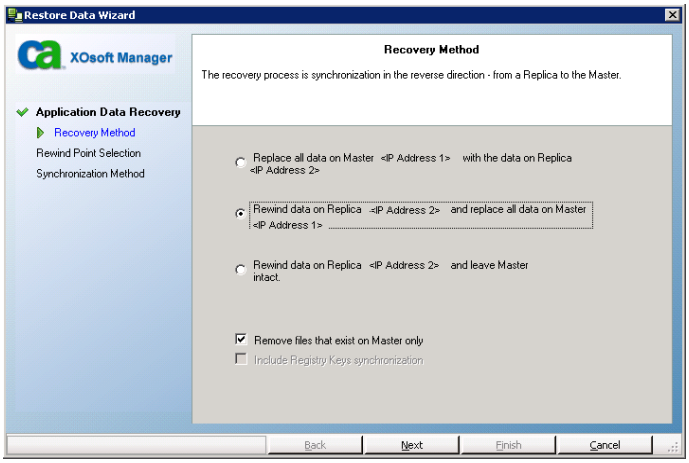
The following procedure is the same for all server types.

To recover all lost data from a Replica

1. On the Manager, select the desired scenario from the Scenario pane and stop it.
2. (For database applications only) Stop the database services on the Master host.
3. On the Manager, select the Replica host from the scenario folder. If multiple Replicas participate in a scenario, select the one from which you wish to recover data. The Restore Data option is now enabled.
4. From the Tools menu, select Restore Data or click the Restore data from the Standard toolbar.

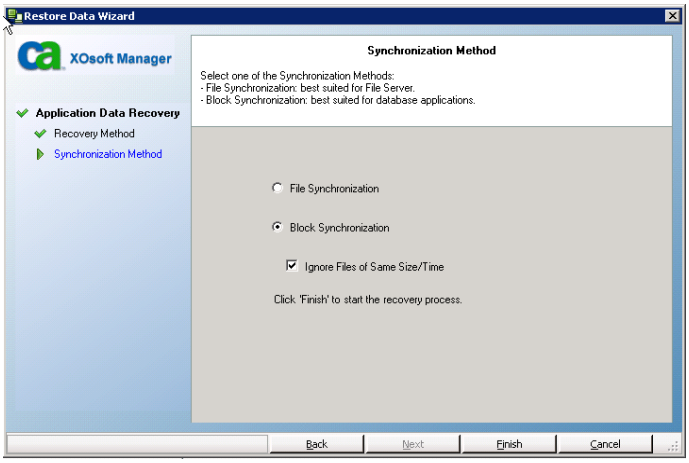
   Note: If the user credentials you used to log in to the Manager are different than the ones required for working with the Engine on the Replica, a User Credentials dialog opens, asking you to enter logon account details for the selected Replica.

   The **Recovery Method** page of the Restore Data wizard appears:



   Note: If the Data Rewind property is set to On, another Restore Data dialog will appear. In this case, select the first option - **Replace all data on Master with the data on Replica**. This option simply restores data without a rewind.

5. Click **Next**. The **Synchronization Method** page appears:

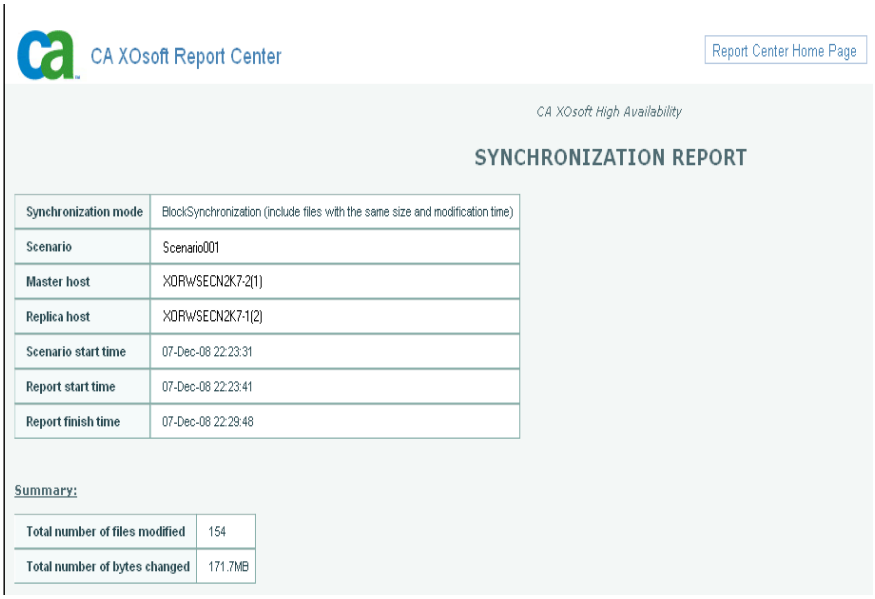


6. Make sure that the appropriate Synchronization method is selected. For more details, see the CA XOsoft User Guide. Click **Finish.**

   Once you finished initiating the recovery process, CA XOsoft builds a temporary reverse tree using the selected Replica as the root, and the Master as the terminating node. After the Master recovery process ends, the temporary scenario is deleted, and you receive the following message in the Event pane: **Synchronization finished**.

   Note: If an error occurred during the temporary Recovery scenario run, the Recovery scenario may stop and remain in the Scenario pane. In this case, you should remove it by right-clicking it and selecting the **Remove** option from the pop-up menu. After the Recovery scenario is removed, the original scenario re-appears in the Scenario pane. Then, you can restart the original scenario, and repeat the recovery process if necessary.

7. By default, once a data recovery occurs a Synchronization Report is generated:



CA XOsoft Report Center

Report Center Home Page

CA XOsoft High Availability

SYNCHRONIZATION REPORT

Synchronization mode	BlockSynchronization (include files with the same size and modification time)
Scenario	Scenario001
Master host	XORWSECN2K7-2(1)
Replica host	XORWSECN2K7-1(2)
Scenario start time	07-Dec-08 22:23:31
Report start time	07-Dec-08 22:23:41
Report finish time	07-Dec-08 22:29:48

Summary:

Total number of files modified	154
Total number of bytes changed	171.7MB

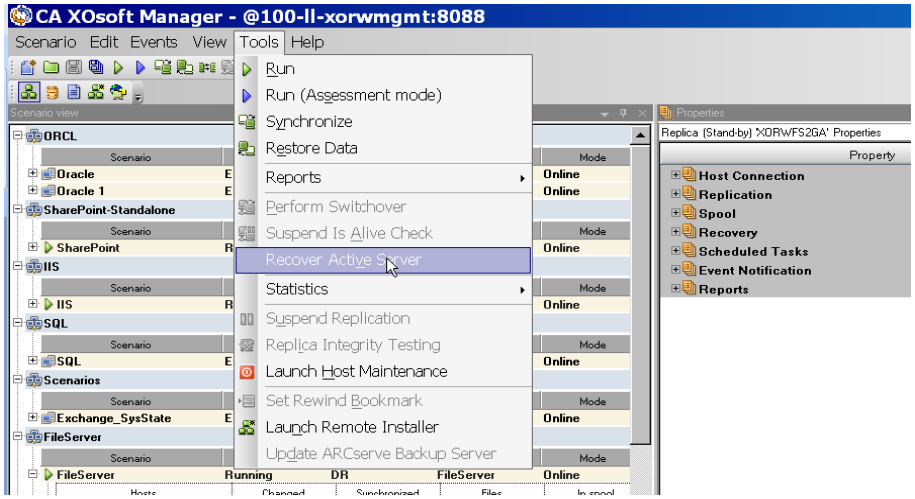
Now, the replication process can restart following the original scenario.

Recover Active Server

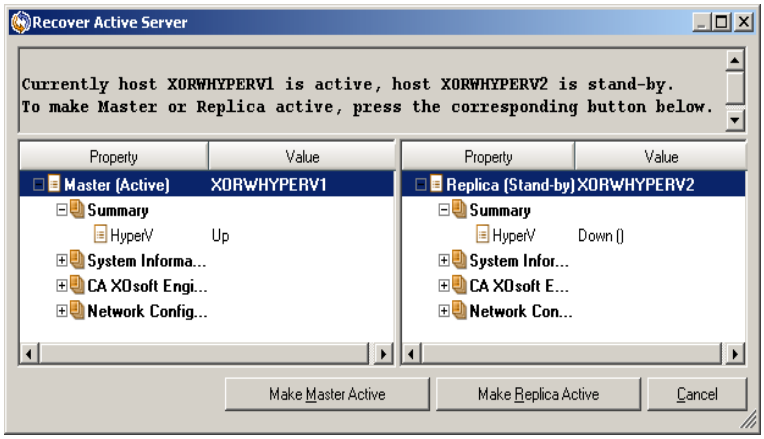
In certain circumstances, it may be necessary to forcibly make the Master or Replica server the active server without completing the data synchronization process. For example, if switchover occurred but no data was changed on the Replica server. In this case you may even have newer data on the Master server making it undesirable to synchronize data from the Replica to the Master server. CA XOsoft HA allows for this option through a process called Recover Active Server. To use this option, ensure that the scenario is stopped, and select *Recover Active* Server from the Tools menu.

Important! While this option is the right choice in many situations, use it with caution. If used improperly data loss can occur. Normally, CA XOsoft HA will not allow switchover from one host to another until all data is synchronized. It is designed this way so users are not redirected to an out of date data set that then overwrites what may be a more current data set. When using Recover Active Server, CA XOsoft HA is forcing users to one server or the other with no regard as to which server has the correct data set. Thus, as an administrator, you must manually ensure that the server you are making active has the most up to date data set.

If the Recover Active Server method does not solve the problem, you can manually recover a server. For more information, refer to the section, Recovering Servers (see page 66).



Select either *Make Master Active* or *Make Replica Active* depending onto which server you want to force the active role.



Important! If a legitimate switchover in a disaster situation occurs and users are redirected to the Replica server for any period of time, it is important to replicate all changes on the Replica back to the Master before making the Master server active. Using *Recover Active Server* in such a situation results in loss of data.

How to Restore Data on vCenter Machines

Using rewind points, vCenter Server has its own view on the Select Rewind Point dialog. Click the vCenter option to enable this view and then select a rewind point from the desired machine.

Recover vCenter Server Data with Rewind Points

The Data Rewind recovery method allows you to rewind data to a point in time before it was corrupted. The rewind process takes place on the Replica server before the reverse synchronization process starts. Data Rewind uses rewind points, or bookmarks, to reset current data back to a previous state.

You can use this method only if you set the Recovery-Data Rewind option to On. If Off, the system does not register data rewind points.

Important! Data Rewind operates in one direction only - there is no replay forward. After rewind, all data subsequent to the rewind point is lost, since data after the rewind point is overwritten with new data.

To recover lost data using rewind points in a vCenter Server HA scenario

1. From the CA XOsoft HA Manager, select the desired scenario and stop it.
2. From the Manager, select the Replica host to enable Restore Data options.
3. From the Tools menu, select Restore Data, or click the Restore Data button to open the Recovery Method dialog.
4. Choose the desired Rewind Data method, depending on whether you want the rewind data synchronized back to the Master or left on the Replica only. When you choose a Rewind Data option, a Recovery Scenario is automatically created. This Recovery Scenario runs until the end of the rewind process. Click Next to continue.
5. Wait while the Rewind Point Selection dialog retrieves information. When the Select Rewind Point button is enabled, click it to continue.
6. The Select Rewind Point dialog for vCenter Server opens. This dialog displays information specific to vCenter scenarios. You can choose to display rewind points by Root Directory or by Database, as well as filter rewind points by file name or start time. Select the desired rewind point and click OK to return to the Rewind Point Selection dialog, which now displays the rewind point you selected.
7. Click Next to open the Synchronization Method dialog.
8. Choose File Synchronization and then click Finish. If you are prompted for user credentials, enter them now for the specified Replica server.

CA XOsoft HA rewinds the data to the point you selected. After the rewind process ends, the following message is displayed in the Event Pane: Rewind process is completed successfully.

If you chose to replace the data on the Master with the data on the Replica, CA XOsoft HA starts a synchronization process from the Replica to the Master. Once completed, the temporary Recovery Scenario is stopped and then deleted. If you wish, you can view the Synchronization Report that is generated by default. At this time, Replication can restart on the original scenario.

Appendix A: Additional Information and Tips

This chapter provides you with helpful information concerning the application.

- When a CA XOsoft scenario begins, the DNS Time-To-Live (TTL) parameter is modified according to the scenario configurable value DNS TTL. This property is found in the High Availability properties list under the Network Traffic Redirection – Redirect DNS group. The original TTL value, however, which may have been much longer, may still be cached on the clients since it is not updated until it expires.
- By default, the spool is located in the CA XOsoft installation /tmp directory. You can change the default location by modifying the pathname for spool directory. It is best to configure the spool on a non-SQL database or log file drive. Using a dedicated volume for the spool folder can increase performance under high load. If you do change the spool location, please remember to remove the new path from the anti-virus scans, both scheduled and real-time.
- CA XOsoft supports bandwidth limitation and bandwidth limitation scheduling. If you require such features, please consult the *CA XOsoft User Guide*.

This section contains the following topics:

Spool Directory Settings

The CA XOsoft spool is a folder on disk where data to be replicated is backed up (spooled) if bandwidth is not sufficient to transfer the amount of changes in real-time. Data can spool due to temporary network disconnections, network congestion, or simply because the network bandwidth is not sufficient to transfer the amount of data changing over on the server. In addition to storing changes waiting on available bandwidth, spool space is also used as part of the normal synchronization process. Thus, some spool build up during synchronization is normal.

Place the CA XOsoft spool folder on a drive with relatively low use such as a dedicated volume or boot/system volume. Do not place the spool folder on a volume containing frequently accessed system (OS), user, or application data. Examples include volumes containing databases, shared files, or the system pagefile. By default, the spool folder is located in the tmp folder under the CA XOsoft installation directory. The spool parameters, located in the properties tab (on both master and replica) or set with the New Scenario Wizard, determines how much disk space is available for the spool. In most cases the default values are sufficient. However, if you choose to change this value, it should be at least 10% of the total dataset size. For example, if you are replicating 50 GB of data on a server you should ensure that at least 5 GB of space is available for spool. Please note that this space is not pre-allocated.

Important! If you change the spool location, please remember to remove the new path from file level antivirus scans: both scheduled and real time.

Note: The CA XOsoft Spool Directory is not a pre-allocated space folder and will be used only if needed.

Setting Bookmarks

A *bookmark* is a checkpoint that is manually set to mark a state that you may want to rewind back to. We recommend setting a bookmark just before any activity that may cause data to become unstable. Bookmarks are set in real-time, and not for past events.

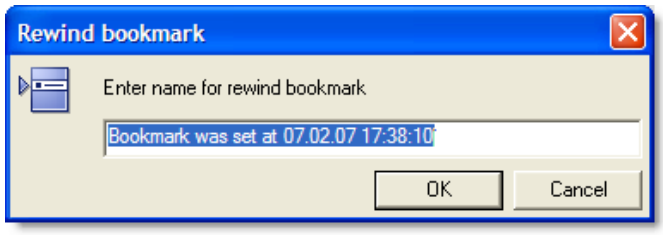
Notes:

- You can use this option only if you set the **Recovery - Data Rewind** option to **On** (default setting is Off).
- You cannot set bookmarks during the synchronization process.

To set a bookmark

1. When the required scenario is running, on the Scenario pane select the Replica host from which you want to rewind data.
2. From the **Tools** menu, select the **Set Rewind Bookmark** option.

   The **Rewind bookmark** dialog opens.

   The text that appears in the **Rewind bookmark** dialog will appear in the **Rewind Points Selection** dialog as the bookmark's name. The default name includes date and time.
3. Accept the default name, or enter a new name for the bookmark. It is recommended to give a meaningful name that will later help you recognize the required bookmark. Then, click **OK**.

   The bookmark is set.

Troubleshooting vCenter Server Scenarios

The following information is provided to help you resolve any errors and warnings.

EM00589 License Servers configured on vCenter are not consistent

Reason:

License Server deployment on the Master and Replica is not the same. One is locally installed and the other is remotely installed. These should be the same on Master and Replica.

Action:

Reconfigure the settings for the License Server on the Replica.

EM00590 Databases configured on vCenter are not consistent

Reason:

Either the deployment or the database type of the database server on the Master differs from the Replica and must be the same.

Action:

Reconfigure database settings on the Replica.

EM00591 vCenter versions configured are not consistent

Reason:

The vCenter version on the Master differs from that on the Replica and must be identical.

Action:

Re-install vCenter on the Replica.

EM00592 Distributed databases configured on vCenter are not consistent

Reason:

The Database Server hostname or instance name on the Master differs from that on the Replica and must be the same.

Action:

Reconfigure the database settings on the Replica.

EM00594 Database usernames configured for vCenter are not identical

Reason:

The account for vCenter used to access the Database Server on the Master differs from that on the Replica and should be identical.

Action:

Reconfigure the ODBC settings on the Replica.

EM00596 Oracle server name configured on replica for vCenter is not localhost

Reason:

This is a configuration error.

Action:

Change the ODBC setting using "localhost" as the hostname on the Replica.

EM00597 SQL server name configured on replica for vCenter is not localhost

Reason:

This is a configuration error.

Action:

Change the ODBC setting using "localhost" as the hostname on the Replica.

EM00598 The vCenter database names configured are not consistent

Reason:

This is a configuration problem.

Action:

Reconfigure the database settings on the Replica to match those on the Master.

EM00599 The vCenter database on master <IP Address> is distributed deployed and AR isn't supported

Reason:

If the vCenter Server database is on a remote machine, AR is not supported.

Action:

Restart CA XOsoft. AR options should be dimmed when CA XOsoft detects remote database deployment.

ER00603 Unknown parameter. vCenter configurations can't be compared

Reason:

This is due to an internal program error.

Action:

Retry.

ER00604 vCenter HA information is not initialized

Reason:

The Engine on the Master or Replica is having problems.

Action:

Verify the Engine is working and retry.

EM00590 Databases configured on vCenter are not consistent

Reason:

The Database server type on the Master differs from that on the Replica and must be the same.

Action:

Reconfigure the database server on the Replica.

ER00605 Failed to configure DB Server

Reason:

Something is wrong with the registry setting on the Replica: HKEY_LOCAL_MACHINE_SOFTWARE\VMware, Inc.\VMware vCenter\DB

Action:

Confirm ODBC settings for vCenter are correct and check the registry key. If it does not exist, re-install vCenter on the Replica.

ER00606 Failed to configure License Server

Reason:

Something is wrong with the registry setting on the Replica: HKEY_LOCAL_MACHINE_SOFTWARE\VMware, Inc.\VMware vCenter\vCenter

Action:

Check the registry key. If it does not exist, re-install vCenter on the Replica.

ER00607 Failed to configure Managed IP

Reason:

Something is wrong with the registry setting on the Replica: HKEY_LOCAL_MACHINE_SOFTWARE\VMware, Inc.\VMware vCenter\vCenter

Action:

Check the registry key. If it does not exist, re-install vCenter on the Replica.

ER00608 Failed to configure DB password

Reason:

Something is wrong with the registry value "3" on the Replica: HKEY_LOCAL_MACHINE_SOFTWARE\VMware, Inc.\VMware vCenter\DB

Action:

Check the registry key. If it does not exist, re-install vCenter on the Replica.

ER00609 Failed to configure Web Access Port

Reason:

Something is wrong with the registry value "WebCenterPort" on the Replica: HKEY_LOCAL_MACHINE\SOFTWARE\VMWare, Inc.\VMware vCenter

Action:

Check the registry key. If it does not exist, reinstall vCenter on the Replica.

WM00529 Distributed License Servers configured on vCenter are not consistent

Reason:

The registry value "License Path" of key HKEY_LOCAL_MACHINE\SOFTWARE\VMware, Inc.\VMware vCenter on Replica should be the same as on Master.

Action:

Reconfigure the license server setting on the Replica.

WM00531 License Servers configured on vCenter are not consistent

Reason:

License Server deployment on the Master and Replica is not the same. One is locally installed and the other is remotely installed. These should be the same on Master and Replica.

Action:

Reconfigure the settings of the License Server on the Replica.

WM00532 Databases configured on vCenter are not consistent

Reason:

Either the deployment or the database type of the database server on the Master differs from the Replica and must be the same.

Action:

Reconfigure database settings on the Replica.

WM00533 vCenter versions configured are not consistent

Reason:

The vCenter version on the Master differs from that on the Replica and must be identical.

Action:

Re-install vCenter on the Replica.

WM00534 Distributed databases configured on vCenter are not identical.

Reason:

The Database Server hostname or instance name on the Master differs from that on the Replica and must be the same.

Action:

Reconfigure the database settings on the Replica.

WM00535 Unable to receive vCenter information from <IP Address>

Reason:

This is an internal program error, engine disconnect or timeout.

Action:

Wait and retry the request later.

WM00536 Database usernames configured for vCenter are not identical

Reason:

The account for vCenter used to access the Database Server on the Master differs from that on the Replica and should be identical.

Action:

Reconfigure the ODBC settings on the Replica.

WM00537 WebCenter ports configured on vCenter are not identical

Reason:

The WebCenter ports on the Master differ from those set on the Replica and should be identical.

Action:

Re-install vCenter on the Replica and ensure the WebCenter ports are the same as those on the Master.

WM00538 The vCenter Managed IP <IP Address> isn't set in Move IP list

Reason:

You have set a vCenter Managed IP but not added it to the Move IP properties located in the Switchover properties list.

Action:

Add the managed IP address to the Move IP list when setting switchover properties.

WM00540 SQL server name configured on replica for vCenter is not localhost

Reason:

This is a configuration error.

Action:

Change the ODBC setting using "localhost" as the hostname on the Replica.

WM00541 License server name configured on replica for vCenter is not localhost

Reason:

This is a configuration error.

Action:

Change the value "License Path" to "xxxx@localhost" style on Replica.

WM00542 License server ports configured for vCenter are not consistent

Reason:

This is a configuration error.

Action:

Re-install vCenter to reconfigure the license server on the Replica.

WM00543 License files folders configured are not consistent

Reason:

This is a configuration problem.

Action:

Reinstall vCenter to specify the correct folder for License files.

WM00544 The vCenter database names configured are not consistent

Reason:

This is a configuration problem.

Action:

Reconfigure the database settings on the Replica to match those on the Master.

WM00588 Distributed License Servers configured on vCenter are not consistent

The registry value "License Path" of key HKEY_LOCAL_MACHINE\SOFTWARE\\VMware, Inc.\\VMware vCenter on Replica should be the same as on Master.

Action:

Reconfigure the license server setting on the Replica.

Recovering Servers

CA XOsoft can detect when a Replica server is now active and runs the recovery process automatically. If recovery does not complete correctly for some reason, do the following:

- First, perform the Recover Active Server procedure. For more information, refer to the topic, Recover Active Server.
- If the Recover Active Server procedure does not resolve the issue, try one or more of the following manual tasks appropriate to the redirection method you use:
  - If IP Redirection is used, manually remove the IP. You cannot use this method for scenarios that do not support Move IP redirection (Hyper-V HA, CS HA). For more information, refer to the topic, Manually Recover a Failed Server when IP Redirection is used. (see page 66)
  - If Switch Computer Name Redirection is used, manually switch the names. You cannot use this method for scenarios that do not support Switch Computer Name Redirection (Hyper-V HA, Exchange HA, vCenter HA if local Oracle is used). For more information, refer to the topic, Manually Recover a Failed Server when Switch Computer Name Redirection (see page 66) is used.
  - If both IP and Switch Computer Name Redirection methods are used, manually remove the IP and switch the computer names. You cannot use this method for scenarios that do not support Move IP and Switch Computer Name redirection (Exchange, CS HA). For more information, refer to the topic, Manually Recover a Failed Server - IP and Switch Computer Name is used (see page 68).

Manually Recover a Failed Server - Move IP Address

To recover a failed server when Move IP redirection is used

1. Boot the Master server without a network connection, to avoid IP conficts.
2. From the TCP/IP properties dialog, remove the additional IP address.
3. Reboot the server and reconnect to the network.
4. If it is not already running, start the scenario from the CA XOsoft Manager. If automatic reverse replication was set to On, the scenario runs in backward mode so that the Replica server is now active and the Master server is on standby.
5. Wait for synchronization to complete.
6. Perform a manual switchover to return the active role to the Master server. It is recommended that you do so outside of normal business hours.

Manually Recover a Failed Server-Switch Computer Name

Important! When Oracle is installed locally and used by vCenter Server, the Switch Computer Name redirection method is not supported.

To manually recover a failed server using the Switch Computer Name redirection method

1. Boot the Master server without a network connection, to avoid duplicate network names.
2. Rename the server to <NewServerName>-XO and move it to a temporary workgroup. For example, if the server is called "Server1", rename it to "Server1-XO". You will be required to reboot this machine. After the reboot completes, the following error appears: "At least one Service could not be started." Ignore this, it is normal under these circumstances because the CA XOsoft Engine usually runs in a domain account.
3. Connect to the network.
4. Rejoin the domain, ensuring that you use the -XO name assigned in step 2.
5. Reboot the computer.
6. If it is not already running, start the scenario from the CA XOsoft Manager. (If automatic reverse replication was set to On, the scenario runs in backward mode so that the Replica server is now active and the Master server is now standby.)
7. Wait for synchronization to complete. Perform a manual switchover to make the Master server active. It is recommended that you do so outside of normal business hours.

Manually Recover Failed Server-IP and Switch Name

To manually recover a failed server when both IP and Switch Computer Name Redirection are used

1. Repair any hardware problems that could have caused the switchover, if any.
2. Reboot the server without a network connection to prevent IP conflicts.
3. From the TCP/IP properties dialog, remove the additional IP address.
4. From the System Properties, Computer Name dialog, change the Computer Name to <ServerName>-XO. For example, if your server is called Server 3, rename it to Server 3-XO.
5. Assign the server to a temporary workgroup.
6. Restart the computer to enable your changes to take effect. When rebooting completes, reconnect to the network now. Ignore the message, "At least one service failed during system startup." This is normal because the CA XOsoft Engine runs in a domain, which is not currently available.
7. Rejoin the domain, making sure you use the -XO name, and reboot again.
8. The reverse scenario begins and the Replica server assumes the active role. Wait while synchronization completes.
9. Perform a manual switchover by clicking the Perform Switchover button from the toolbar, to return the active role to the Master server.

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