CA XOsoft™ Replication for Windows

Microsoft® Hyper-V 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
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Note: CA XOsoft is sold in Japan under the names, CA ARCserve Replication and CA ARCserve High Availability.

Contents

Chapter 1: Introduction

This document outlines a disaster recovery solution for Hyper-V, based on replication to a local or remote replica server. In case of a critical failure where it is not possible to simply make the Hyper-V data available again immediately (due to server crash, or worse - total site disaster), it is possible to recover from the backup server or to switch your users to the replica (backup) Hyper-V server and resume operation in minimum time.

The goal is to provide a step-by-step guide to the procedures that must be carried out before and after failure, in order to achieve successful disaster recovery of your Hyper-V server.

Important! CA XOsoft provides reliable Hyper-V disaster recovery. However, since recovery is a manual process, you must follow the steps in this guide exactly to be successful. You should customize the steps listed in this guide only if:

1. You are very familiar with CA XOsoft and fully understand the potential impact.
2. You have fully tested the steps in a lab environment before implementing in a production environment.

For a fully automated solution, please review the *CA XOsoft HA for Hyper-V Operation Guide*.

This section contains the following topics:

About This Guide

This document describes how to implement a Disaster Recovery solution for Hyper-V Server using CA XOsoft. Please review each procedure before starting, to ensure you have the appropriate resources and permissions to carry it out.

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.

Hyper-V Server Configuration Requirements

- Install 64-bit Microsoft Windows Server 2008 with the Windows 6.0-KB950050-x86.msu patch on Master and Replica, each with a CPU and motherboard capable of running Hyper-V. The Replica does not require Windows Server 2008, 64-bit.
- Configure the same number and type of network connections on the Replica that exists on the Master.
- Both Master and Replica servers should reside in the same Active Directory forest and be members of the same domain or trusted domains.

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.

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.

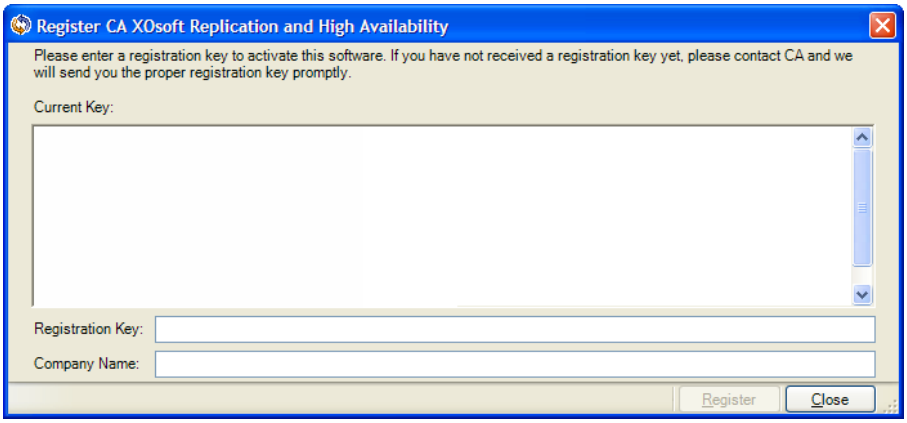
When you are creating a scenario, some of the options might be disabled following the terms of your license. However, you can create as many scenarios as you wish, since the validity of your license key is first checked when you try to run a specific scenario. Only when you click the **Run** button, 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.

Hyper-V Replica Configuration

- Install 64-bit Microsoft Windows Server 2008 with the Windows6.0-KB950050-x86.msu Hyper-V patch on the Master server, with a CPU and motherboard capable of running Hyper-V. The Replica server can run any Windows-based system.
- Configure the same number of network connections on the Replica that exists on the Master.

Chapter 2: Creating and Using Scenarios

This section describes how to create and use disaster recovery scenarios.

This section contains the following topics:

Create a New Hyper-V Replication Scenario

Disaster recovery configuration properties are stored in 'scenarios'. You need to create a scenario for each server you wish to protect.

To create a Hyper V DR Scenario

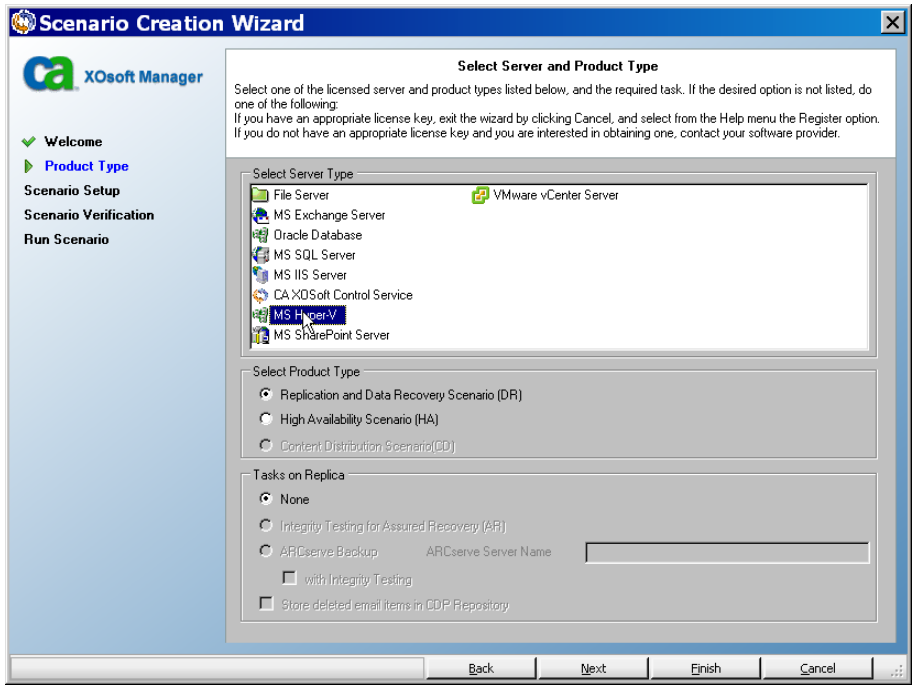
1. Open the CA XOsoft Manager and choose Scenario, New or click the New Scenario button.

   The Welcome dialog opens.

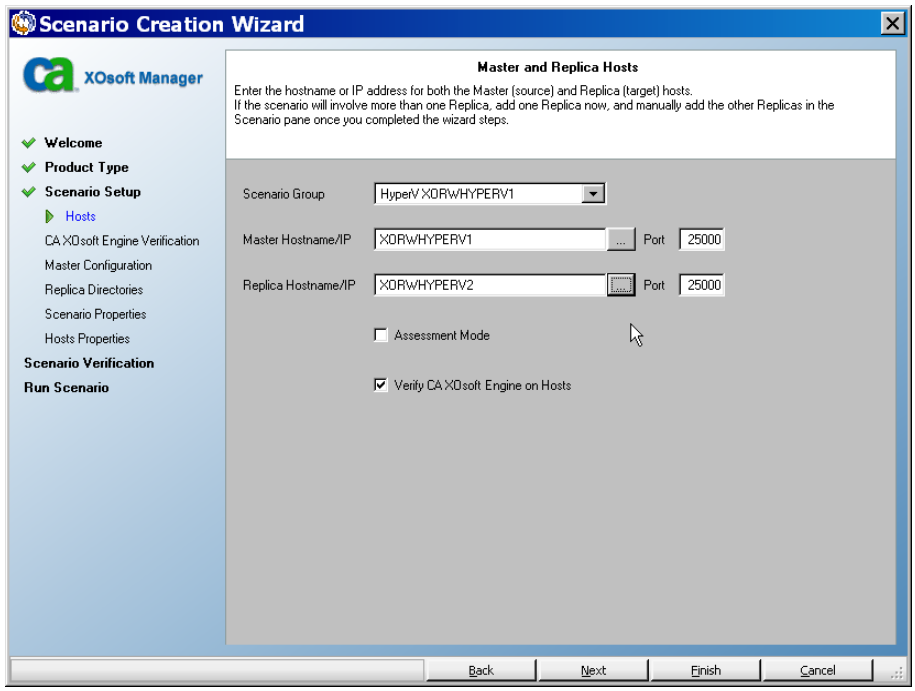
2. Choose Create a New Scenario, select a Group from the list and click Next.

   Note: All scenarios you create are put in this scenario group. If you do not change the name, the final group name includes the Master server name as part of it.

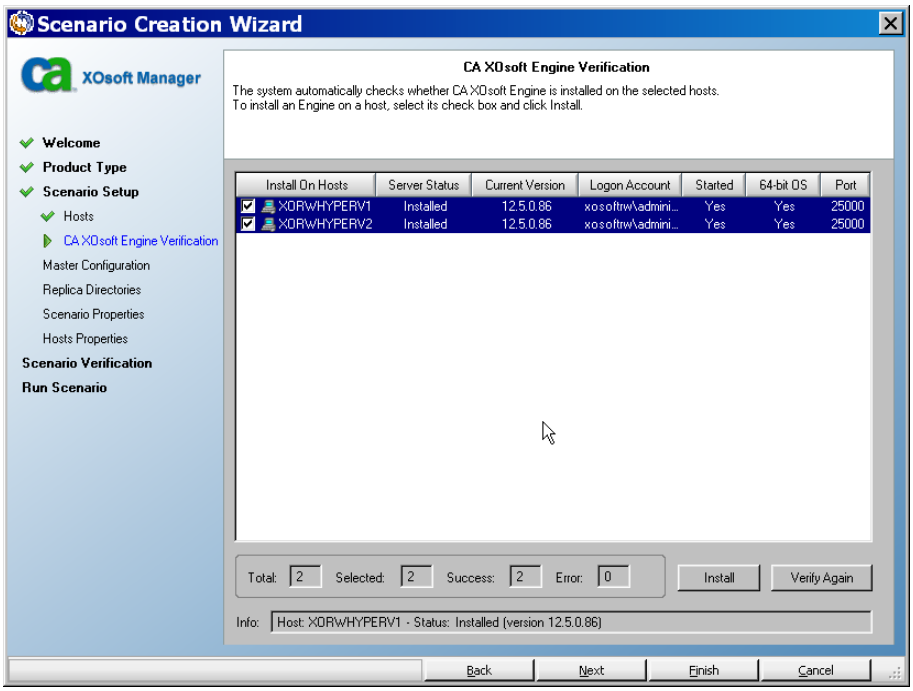
3. The Select Server and Product Type dialog opens. Choose Hyper-V, Replication and Data Recovery Scenario (DR) and click Next.



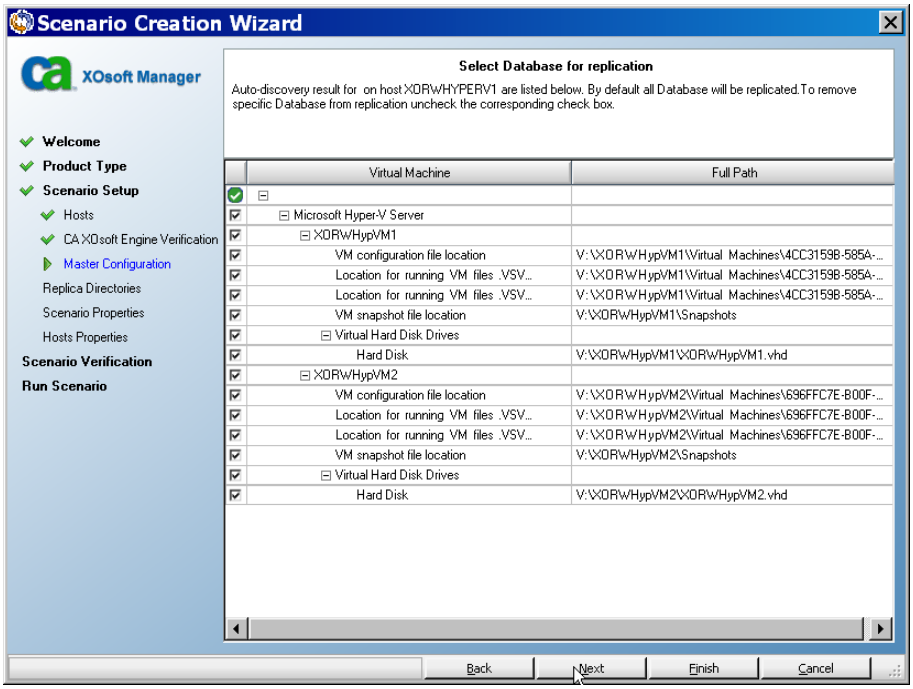
4. The Master and Replica Hosts dialog opens. Select or type a Scenario group Name, enter the Hostname or IP Address and Port number for both Master and Replica servers, enable the Verify CA XOsoft Engine on Hosts option and click Next.



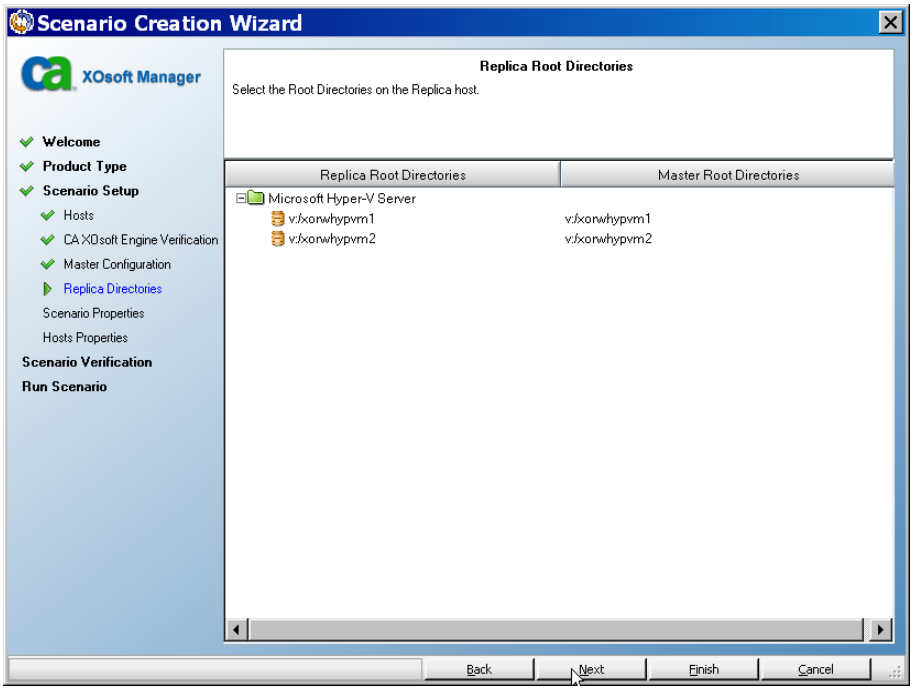
5. Wait for Engine Verification to complete. Click Install if you need to upgrade the Engine service on one or both servers. When ready, click Next.



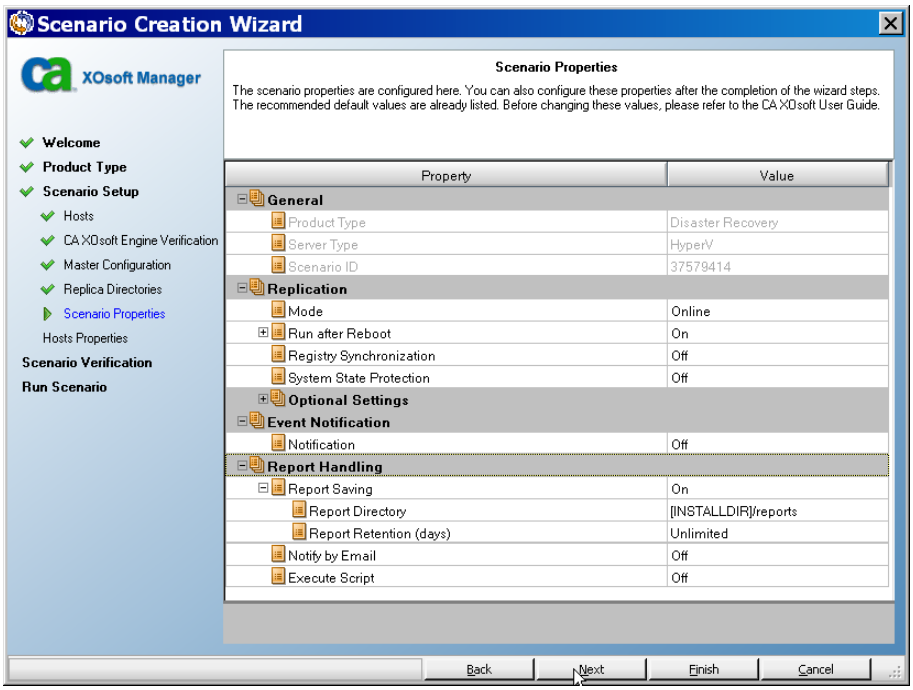
6. The Select Database for Replication dialog opens. Review the list of results auto-discovered on the Master server. By default, all VMs are replicated. Clear choices if desired and click Next.



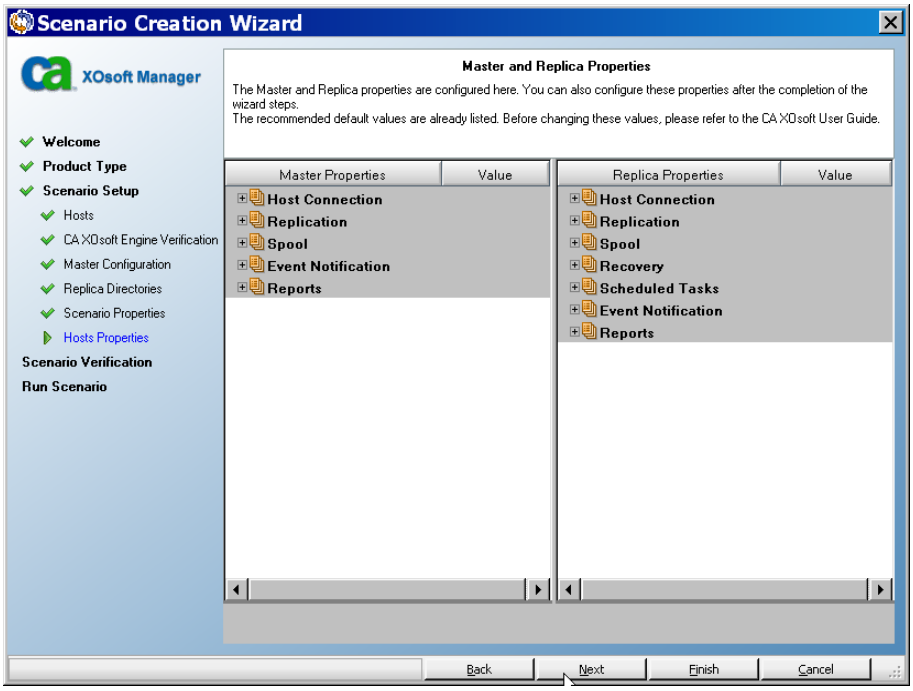
7. The Replica Root Directories dialog opens. Accept the defaults or select the desired root directories on the Replica and click Next.



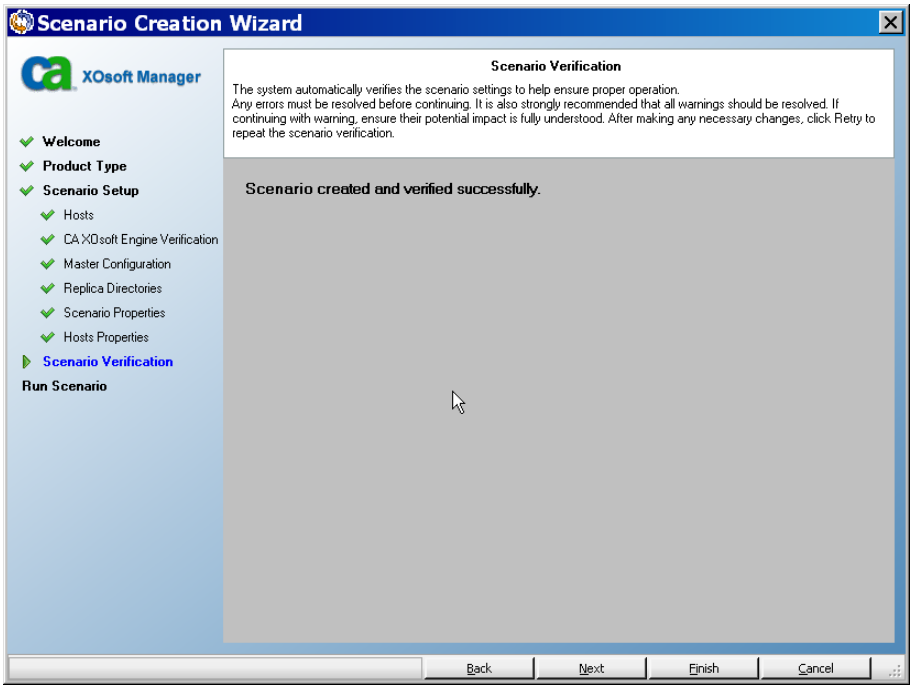
8. The Scenario Properties dialog opens. Set properties, as desired, and click Next.



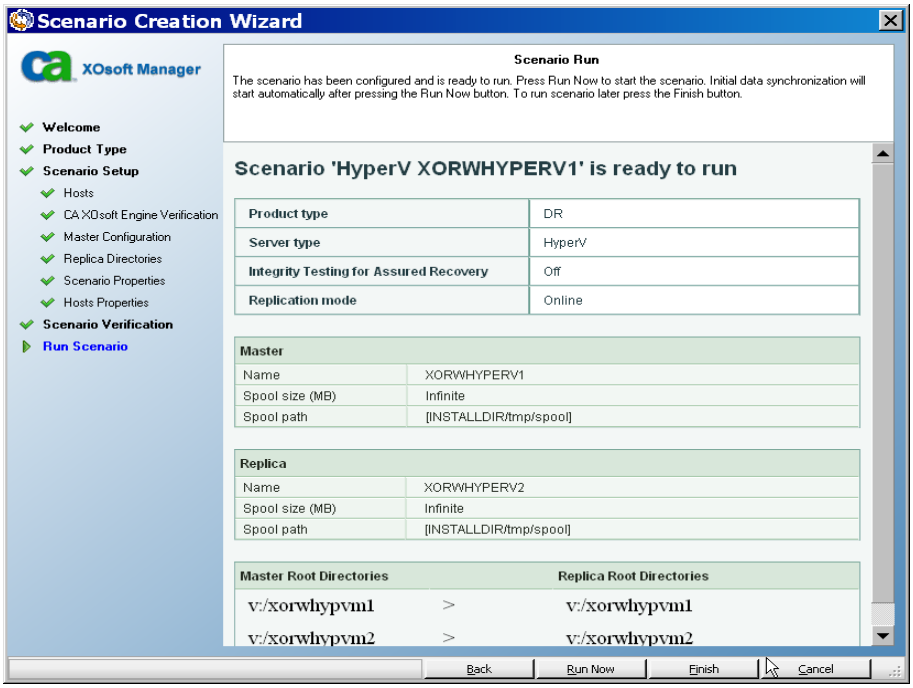
9. The Master and Replica Properties dialog opens. Set properties, as desired, and click Next.



10. Wait for Scenario Verification to complete. Resolve any warning or errors and click Next.



11. From the Scenario Run dialog, click Run Now to initiate synchronization and activate the scenario or click Finish to run the scenario later.

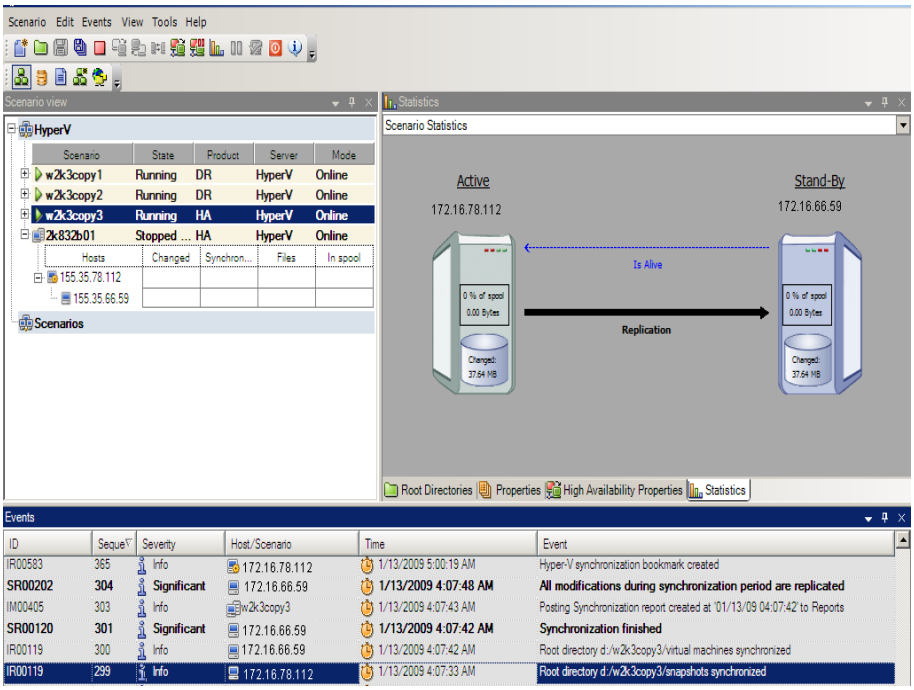


Scenario Properties

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 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. You cannot directly update the Hyper-V root directory. Double-clicking it launches Auto Discovery, which lists all virtual machines on the Master. You can add or remove virtual machines from the Auto Discovery Results dialog.

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 results to the 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 -- Enable Hyper-V schedules booksmarks for Master. 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 for more information.
- Event notification properties -- specify a script to run or choose email notification and write results to the event log.
- Report properties -- choose synchronization or replication reports, specify distribution or script execution.
- (Replica) Recovery properties -- set delay or data rewind properties.

Run a Scenario from Outside the Wizard

After you create a scenario, you need to run it to start the replication process. Normally, before changes to data on the Master can 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 start a scenario:

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

   CA XOsoft verifies the scenario before running it.

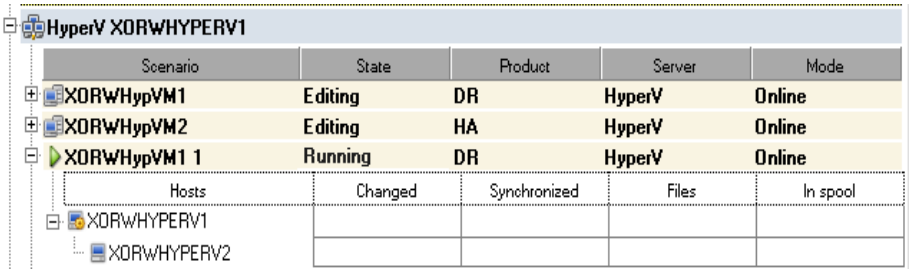
   If the scenario was not set up correctly or problems occurred in the participating hosts, errors are reported on the Event pane.

   Notes:

   - If any errors are displayed, you cannot run the scenario. These errors must be corrected before you can start the replication process.
   - Replication of mount points will succeed 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.
3. From the Run screen, select the following and then click OK:
   - **Synchronization Method** -- For database and virtual machine applications, Block Synchronization is usually best but for File Servers or other applications with large numbers of small files, choose File Synchronization. See the CA XOsoft User Guide for more information.
   - **Ignore files of same size/time** -- Disable this option for database applications. Enable this option for File Server applications to speed up the comparison process and reduce overall synchronization time. See the CA XOsoft User Guide for more information.
   - **Skip Synchronization** -- Select this option only if you are certain that the data in the Master and Replica root directories is identical.

The Manager indicates that the scenario is running with a green play symbol to the left of the scenario, and with the scenario's state, which turns into **Running**:



Once a scenario is running, a Statistics tab appears at the bottom of the Framework pane, displaying a graphical view of the replication.

By default, once synchronization occurs, a Synchronization Report is generated. To view the report, refer to the topic, View a Report.

Note: You can also generate a Replication Report on a regular basis to monitor the replication process on each participating server. For more information, see *CA XOsoft User Guide.*

View a Report

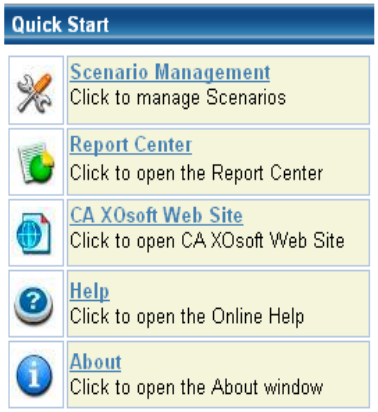
CA XOsoft can generate reports on the replication and synchronization processes. These reports can be stored on your desired location, opened for view from the Report Center, sent by email to a specified address, or they can trigger script execution.

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

To view a report

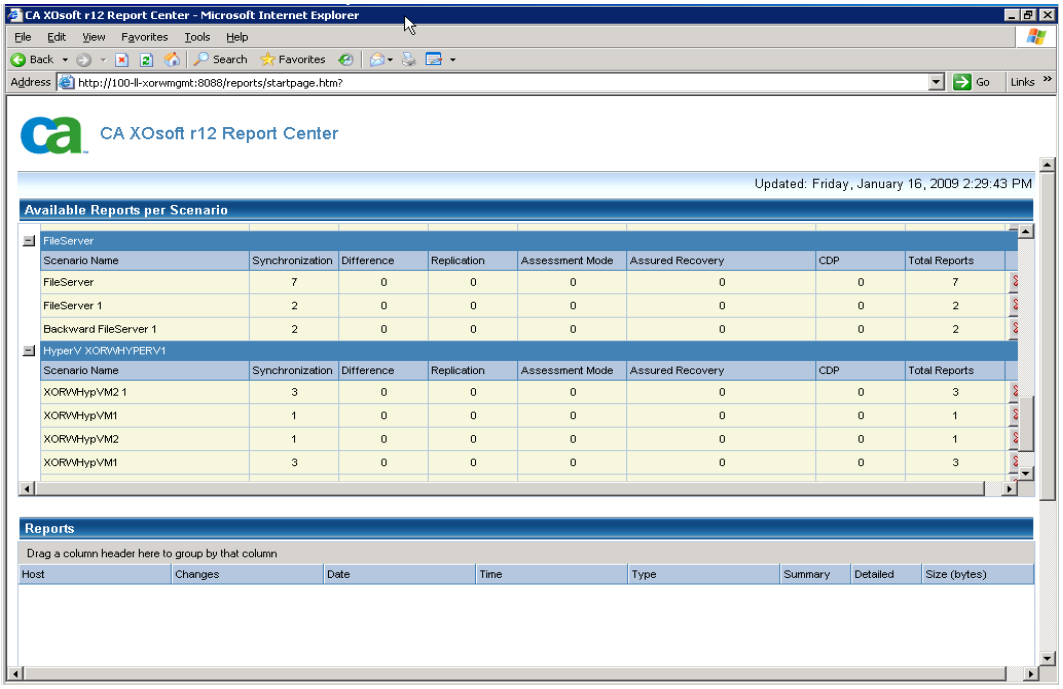
1. To view a report, first you need to open the Report Center. There are two ways to open it:

   - 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:

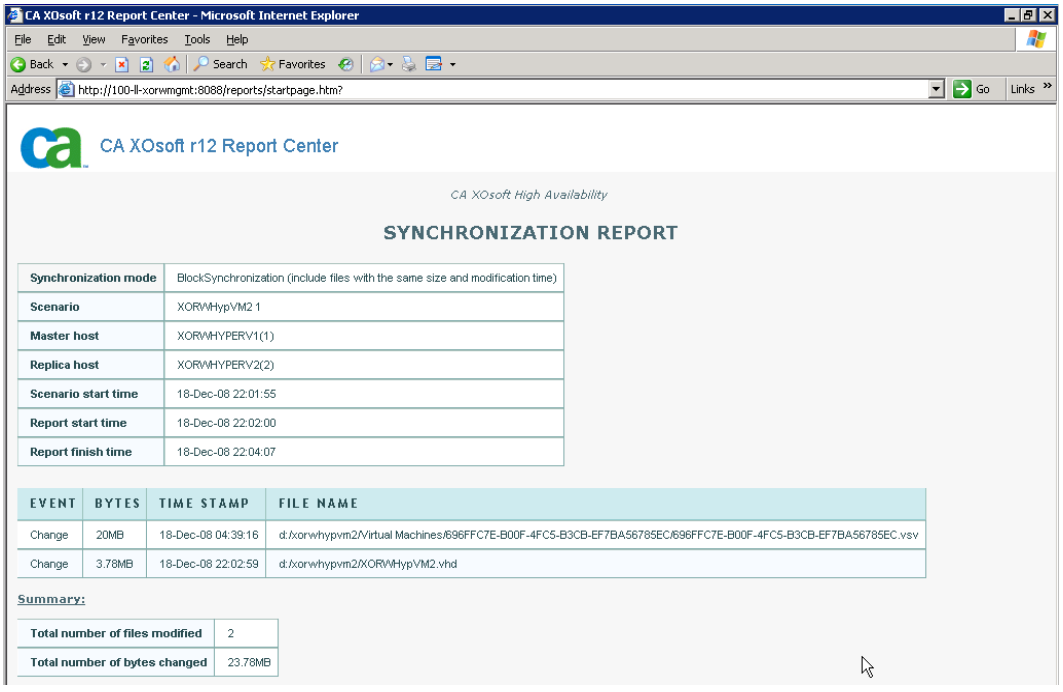
Reports

Drag a column header here to group by that column

Host	Changes	Date	Time	Type	Summary	Detailed	Size (bytes)
XORWHYPERV2	Changes found	12/18/08	22:04:07	Synchronization			1923
XORWHYPERV2	Changes found	12/18/08	04:49:54	Synchronization			2548
XORWHYPERV2	Changes found	12/18/08	04:06:35	Synchronization			3479

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:



Stop a Disaster Recovery Scenario

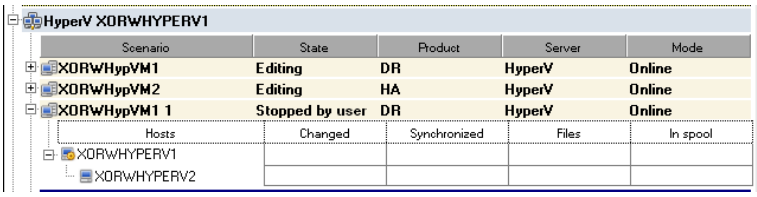
Stopping a scenario stops replication. It may be necessary to stop a scenario to make configuration changes, or perform system maintenance. You can also suspend replication, which is the process of temporarily halting updates on the Replica server. See the CA XOsoft User Guide for more information on replication suspension.

Note: In the following example, a Hyper-V scenario is used, but the steps are the same regardless of scenario type.

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.
3. A confirmation message appears prompting you to approve the scenario stopping. Click **Yes** to clear 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:



Chapter 3: 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.

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.

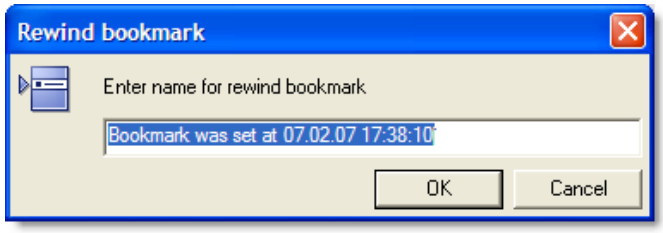
Notes:

- 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.

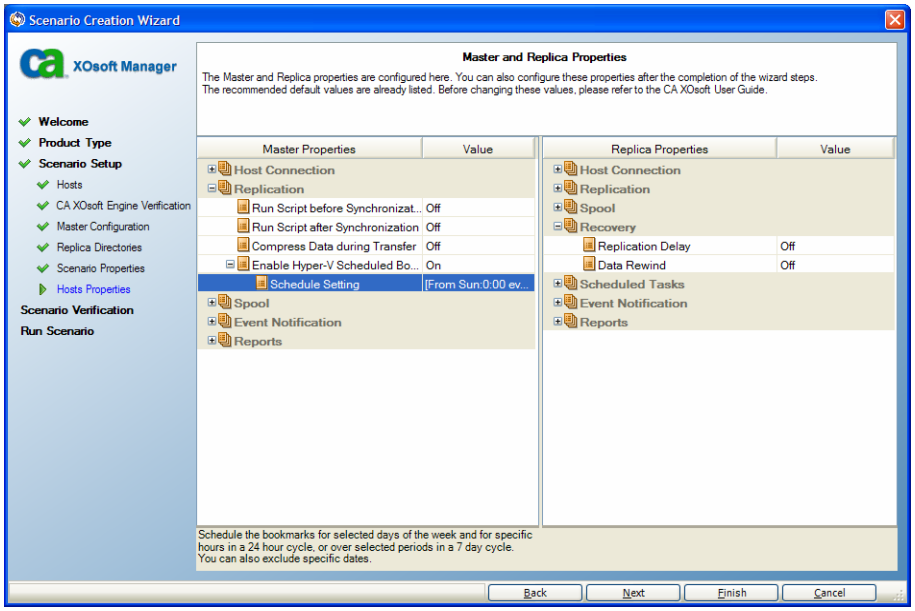
   The **Rewind bookmark** dialog opens.

   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.

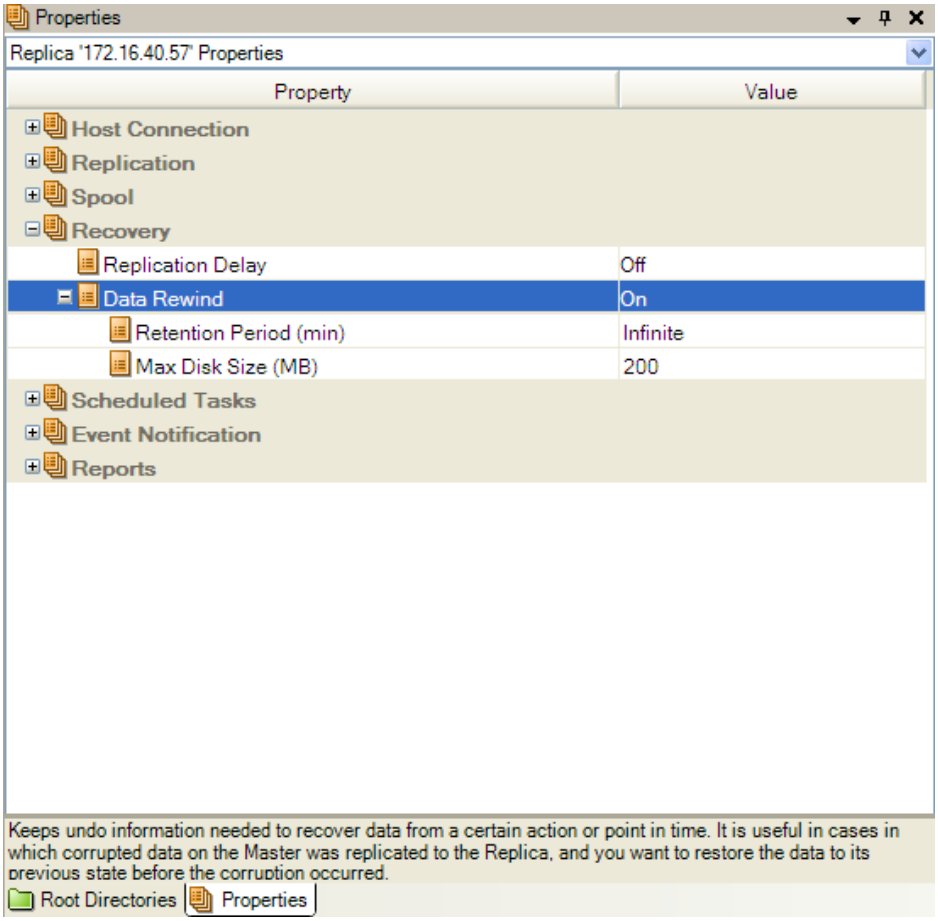
In Master and Replica Properties, the Enable scheduled bookmark option is Off by default. Scheduling bookmarks allows you to use the Data Rewind option (default is Off). Set a regular bookmark schedule by clicking the Value column for Schedule Setting.



Data Rewind

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. The Data Rewind method uses rewind points or bookmarks that enable you to reset the current data back to a previous state.

You can use this option only if you set the **Recovery - Data Rewind** option to **On**: (Default setting is Off.)



If this option is set to Off, the system will not register data rewind points. See the User Guide for more information about Data Rewind parameters (Retention Period, Max Disk Size).

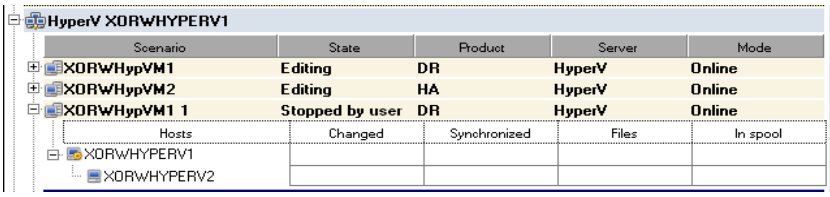
Important! The data rewind process operates in one way only - there is no replay forward. After rewind, all data subsequent to the rewind point will be lost, since data after the rewind point will be overwritten with new data.

Note: The automatic registration of the rewind points starts only after the synchronization process is completed, and the message **All modifications during synchronization period are replicated** appears on the Event pane. Similarly, you cannot manually set bookmarks during synchronization.

To recover lost data using rewind points

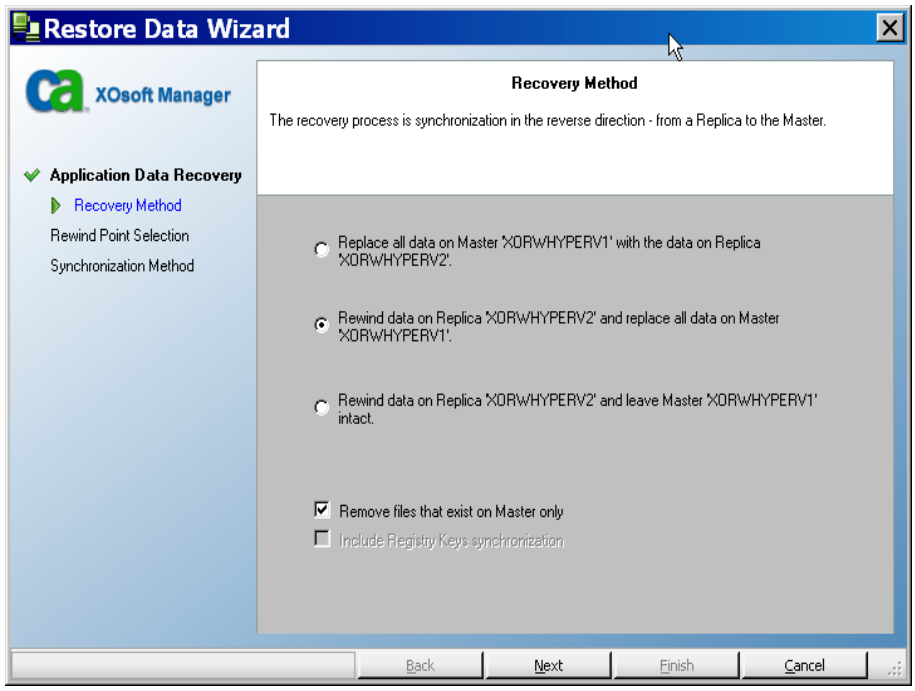
1. [For database applications only] stop the database services on the Master host.
2. On the Manager, from the scenario folder select the Replica host:

   Note: If multiple Replica servers participate in the required scenario, select the Replica from which you want to recover data.



3. From the **Tools** menu, select **Restore Data**, or click the **Restore Data** button. If you are prompted for user credentials, enter the appropriate information and click OK.

   The **Recovery Method** page of the Restore Data Wizard appears.

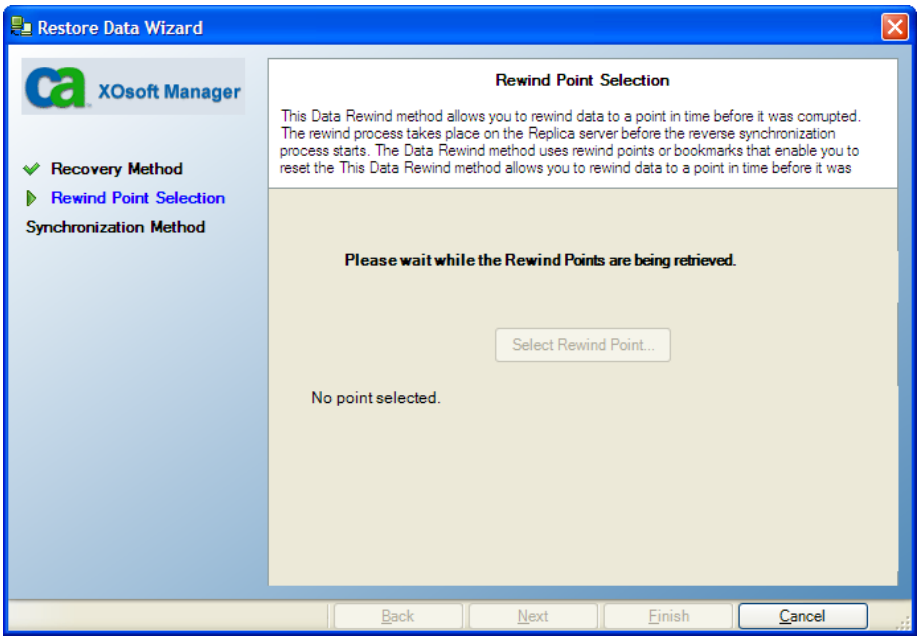


4. Select one of the Rewind data options, depending on whether you want the rewind data synchronized back to the Master (option 2) or left on the Replica only (option 3).

   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 appears, asking you to enter log on account details for the selected Replica.

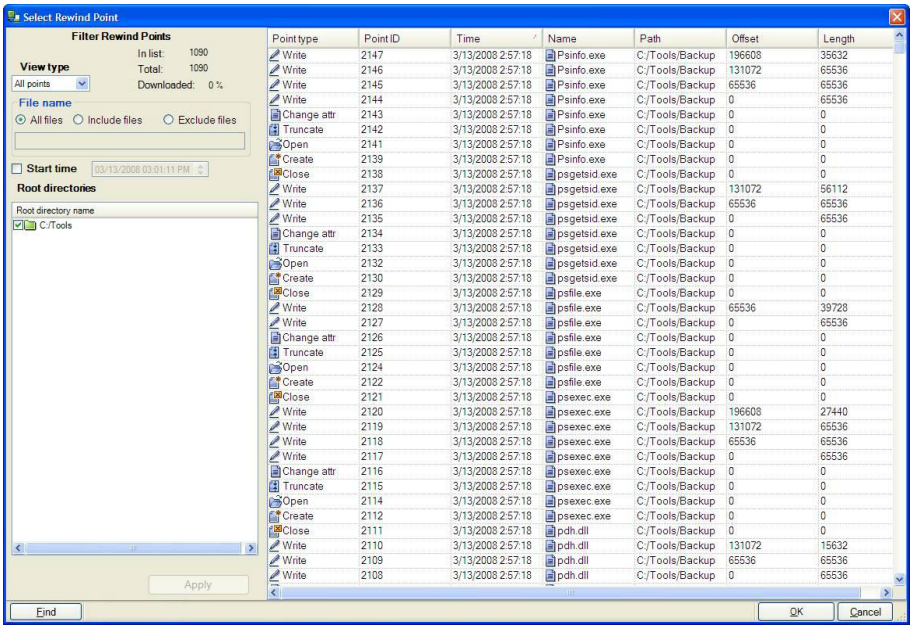
   After you select a Rewind data option, a Recovery scenario is automatically created. This Recovery scenario will run until the end of the rewind process.

5. Click **Next**. The **Rewind Point Selection** page is displayed:



6. Wait until the **Select Rewind Point** button is enabled, and click it to view the existing rewind points.

The **Select Rewind Point** dialog appears:



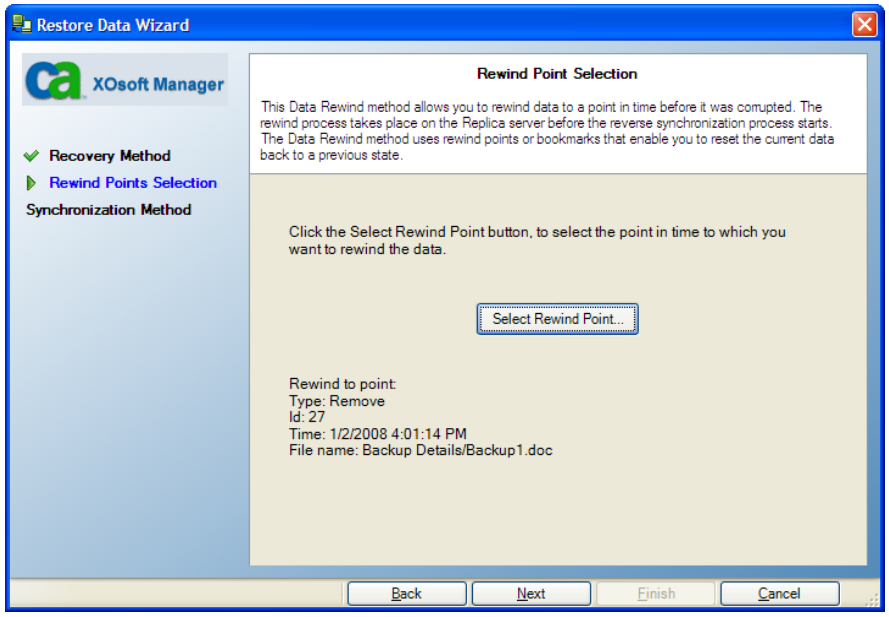
The **Select Rewind Point** dialog displays a list of all rewind points. These include modifications of folders and files that were automatically registered by the system and user-defined bookmarks.

The list can be filtered according to the rewind point type or other criteria, using the **Filter Rewind Points** pane on the left.

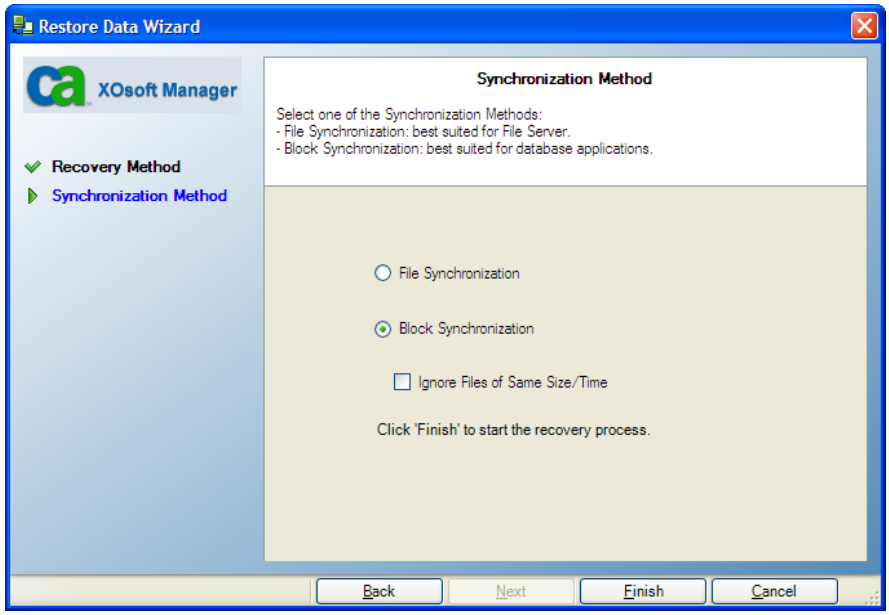
7. Select the required rewind point, and click **OK.**

   Note: If you want to use a Bookmark as the rewind point, it is best practice to select the closest rewind point that indicates an actual event.

You return to the **Rewind Point Selection** page, now displaying information about the rewind point you selected:



8. Click **Next**. The **Synchronization Method** page is displayed:



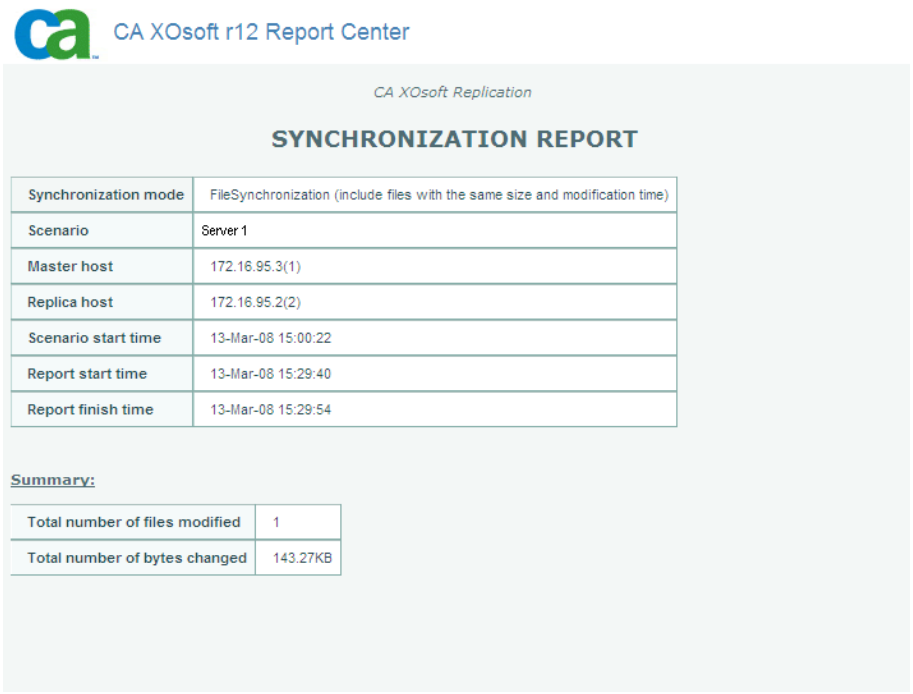
9. Select the **Block Synchronization** method and click **Finish**.

   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 appears, asking you to enter log on account details for the selected Replica.

   CA XOsoft rewinds the data to the point you selected. After the rewind process ends, you receive the following message 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 starts a synchronization process from the Replica to the Master. Once the process ends, the temporary Recovery scenario is stopped and then deleted.

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



CA XOsoft r12 Report Center

CA XOsoft Replication

SYNCHRONIZATION REPORT

Synchronization mode	FileSynchronization (include files with the same size and modification time)
Scenario	Server 1
Master host	172.16.95.3(1)
Replica host	172.16.95.2(2)
Scenario start time	13-Mar-08 15:00:22
Report start time	13-Mar-08 15:29:40
Report finish time	13-Mar-08 15:29:54

Summary:

Total number of files modified	1
Total number of bytes changed	143.27KB

Now, the Replication process can restart on the original scenario.

How to Restore Data on Hyper-V Machines

The process of restoring data from a Hyper-V virtual machine is much like restoring data in any other scenario with the following conditions:

- **Stop the VM** -- CA XOsoft automatically powers off the VM before recovery so that the existing VM can be overwritten. After restore completes, you need to restart the VM manually.
- **Select a bookmark** -- You must roll data back to a specific point in time called a bookmark, or rewind point. The default frequency is 1 hour, but bookmarks can be set at frequencies you define. When you create the Hyper-V scenario, ensure the Enable Hyper-V Scheduled Bookmarks setting is set to On from the Master and Replica Properties screen. For existing scenarios, you can edit this property manually.
- **Synchronize data** -- Use File or Block synchronization.

Appendix A: Additional Information and Tips

This chapter provides you with helpful information concerning the application.

- 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. 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*.

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