

Arcserve® Replication and High Availability

Custom Application Protection Operation Guide for Windows

r16.5

arcserve®

Pre-release Document, only for reference

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Arcserve Product References

This document references the following Arcserve products:

- Arcserve® Replication
- Arcserve® High Availability (HA)
- Arcserve® Assured Recovery®
- Arcserve® Content Distribution

Contact Arcserve

The Arcserve Support team offers a rich set of resources for resolving your technical issues and provides easy access to important product information.

<https://www.arcserve.com/support>

With Arcserve Support:

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- You can use our Live Chat link to instantly launch a real-time conversation between you and the Arcserve Support team. With Live Chat, you can get immediate answers to your concerns and questions, while still maintaining access to the product.
- You can participate in the Arcserve Global User Community to ask and answer questions, share tips and tricks, discuss best practices and participate in conversations with your peers.
- You can open a support ticket. By opening a support ticket online, you can expect a callback from one of our experts in the product area you are inquiring about.

You can access other helpful resources appropriate for your Arcserve product.

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Chapter 1: Introduction

Arcserve RHA provides replication and high availability for the following commercially available applications:

- Microsoft Exchange Server
- Microsoft SQL Server
- Microsoft SharePoint Server
- Microsoft IIS Server
- Microsoft Hyper-V
- Microsoft Dynamics CRM Server
- VMware vCenter Server
- Oracle Database

In addition to these popular applications, unsupported applications and data can still be protected using Full System or File Server scenarios. However, File Server scenarios provide data protection only; applications themselves are difficult to support without custom scripting to manage services. Effective with this release, a new scenario type called Custom Application Protection provides replication and high availability for unsupported applications and data without custom scripting for services management.

In a Custom Application scenario, Arcserve RHA monitors the services you specify, starts them according to the start order you set, and triggers switchover if a critical service fails (in HA scenarios). Custom Application scenarios should not be used to protect applications already supported, like Microsoft SQL or Exchange Server, or to manage complex services. However, for simple applications that can be gracefully started and stopped using Windows Services, Custom Application scenarios provide the framework for replication and high availability with minimal customization.

This section contains the following topics:

[About This Guide](#) (see page 7)

[Related Documentation](#) (see page 8)

[Server Requirements](#) (see page 8)

[Base Configuration](#) (see page 8)

[Register License](#) (see page 9)

About This Guide

This document describes how you can implement a Arcserve RHA solution for Custom Application. It is essential that you have the appropriate resources and permissions to carry out each task.

Related Documentation

Use this Guide with the *Arcserve RHA Installation Guide* and the *Arcserve RHA Administration Guide*.

Server Requirements

Custom Application scenarios are supported on only Windows platforms. For the most current list of supported operating systems, see the Release Notes document or visit the website at arcsolve.com.

Base Configuration

To implement Arcserve RHA, refer to the appropriate list of requirements below, 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, contact Tech Support.

- Two servers running the same Windows version with the same level of service packs and hot fixes installed.
- All IP addresses are statically assigned (DHCP-assigned IP addresses on the Master or Replica are not supported.)
- The protected server is not a domain controller or DNS server.
- (In the Active Directory environment) Both Master and Replica servers should reside in the same Active Directory forest and be members of the same domain or trusted domains.
- Both Master and Replica servers have the same applications installed.

Register License

The Arcserve RHA licensing policy is based on a combination of several parameters which include the following:

- the operating systems involved
- the required solution
- the supported application and database servers
- the number of participating hosts
- additional modules (for example, Assured Recovery)

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 must register the Arcserve RHA product using your license key. To register the product, you need to open the Manager, which does not depend on the existence of a valid registration key. After 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 any number of scenarios, since the validity of your license key is confirmed, before 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 Arcserve RHA using the license key

1. Open the Manager.

The Welcome message appears, followed by a License Warning message informing you that your product is not registered. You are prompted to register it.

2. Click OK to close the message.
3. Open the Help menu and select the Register option.

The Register Arcserve RHA dialog opens.

4. Complete the following fields:

Registration Key field - enter your registration key.

Optional In the Company Name field - enter your company name

5. Click the Register button to register the product and close the dialog.

You can now start working with the Arcserve RHA Manager according to your license permissions.

Chapter 2: Creating and Using Scenarios

Create Custom Application Protection scenarios as you would any Arcserve RHA scenario; use the Scenario Creation Wizard. You can import scenarios from XML configuration files, as well. However, you cannot create Custom Application scenarios from templates.

This section contains the following topics:

[Create a New Custom Application Replication Scenario](#) (see page 11)

[Create a New Custom Application High Availability Scenario](#) (see page 14)

[Manage Services](#) (see page 16)

[Import Scenarios](#) (see page 18)

[Use Scenario Groups](#) (see page 20)

Create a New Custom Application Replication Scenario

Creating generic File Server scenarios is covered in full detail in the Arcserve RHA Administration Guide. This procedure provides the information you need to create scenarios specifically for custom application protection. The Scenario Creation Wizard is the only method by which scenarios can be created, however, you may modify scenarios from the Arcserve RHA Manager.

To create a new custom application replication scenario

1. Open the Manager. From the Scenario menu, click New, or click the New Scenario button on the Standard Toolbar.

The Welcome screen opens. This screen lets you create a new scenario and assign it to a scenario group.

Note: If you want to access other Manager features while creating a new scenario, you can minimize the Scenario Creation Wizard and return to it later. The Wizard is bound to the Scenario View. When you switch views, the Wizard is automatically minimized.

2. Select the required options:
 - a. Select Create a New Scenario.
 - b. Assign your scenario to the group, Scenarios, or type a name to create a new Group.
 - c. Click Next.

The Select Server and Product Type screen opens. This screen lists the supported applications and product types available, depending on how you licensed Arcserve RHA.

3. Select the required Server and Product Type options:
 - a. From the Select Server Type list, click Custom Application.
 - b. From the Select Product Type list, click Replication and Data Recovery Scenario (DR).
 - c. From the Tasks on Replica list, click None. Assured Recovery scenarios are supported with Custom Application scenarios. For more information, see the Arcserve RHA Administration Guide.
 - d. Click Next.

The Master and Replica Hosts screen opens. On this screen you will specify the host to protect (Master) and the host that holds the replicated data (Replica).

4. Select the required Master and Replica Hosts:
 - a. In the Scenario Name field, accept the default name or enter a new one. When entering a name, click a unique name, since you cannot use the same name for more than one scenario.
 - b. In the Master Hostname/IP field, enter the hostname or IP address of the Master server. This is the source machine. Use the Browse button to find one.
 - c. In the Replica Hostname/IP field, enter the host name or IP address of the Replica server. This is the target machine. Use the Browse button to find one. If you want to include additional Replicas in your scenario, enter the details for the first or most upstream server here. When you have finished the Wizard to create the scenario, you can manually enter additional Replica servers, if needed. See the Arcserve RHA Administration Guide for more information.

- d. In the Port fields, accept the default port number (25000) or enter new port numbers for the Master and Replica.
 - e. (Optional) If you want to gather statistics about the accurate bandwidth usage and compression ratio benchmarking without actually replicating data, enable the Assessment Mode option. If you select this option, no replication occurs, but a report is provided after the assessment process is completed. For this example, do not enable this option.
 - f. (Optional) Enable the Verify Arcserve RHA Engine on Hosts option to instruct the system to verify whether the Engines are installed and running on the Master and Replica hosts you specified on this screen. If Engines are not installed on the hosts you specified, you can use this option to install the Engines on one or both hosts remotely. For this example, enable this option.
 - g. Click Next. The Hosts Verification screen opens if you enabled the option, Verify the Engine on Hosts. The software verifies the existence and connectivity of the Master and Replica hosts specified on the previous screen. After connections are verified, the software checks whether an Engine is installed on each host. If the user credentials you used to log in to the Manager are different than the ones required for working with the remote hosts, the Server Status is reported as Not Connected. You are then prompted to enter User Credentials for each selected host. Verification repeats after you do so.
5. From the Hosts Verification screen, check whether an Engine is installed on the selected hosts using the Current Version column. Do one of the following:
- If an Installed indication appears under the Server Status column in both rows, you can move to the next page.
 - If an Installed indication appears, but the version number is different than the version number of the Control Service you are using, click Install to re-install the current version.
 - If a Not Installed indication appears, you must install the Engine. Click Install to remotely install the Engine on the selected host. You can install the Engine on both hosts at once. Click the box for each server and then click Install.
- After you click Install, you are prompted to enter the Engine service log on account credentials:
- For Replication scenarios - it is sufficient to be a Local Administrator (Local System).
 - For Clusters (Including replication scenarios) - you need to run under the same account as the Cluster Service account.
 - For HA scenarios - you need to run under an account with Domain Administrative privileges.
- a. Wait while installation completes and the Engine version number appears in the Current Version column.
 - b. Click Next.

This screen displays the directories and files on the Master server. These directories and files are the data that can be replicated and protected. The software automatically aggregates data with a common path into one directory.

When you select root directories for the Master and Replica servers, the total character length of the root directory plus subdirectory names should not exceed 1024 characters.

6. From the Master Root Directories screen, choose the directories and files you want to include or exclude from replication and click Next. The Services Discovery Result screen opens.
7. See [Manage Services](#) (see page 16) for more information on completing the Services Discovery Result and Services Setting screens.
8. Click Next. The Scenario Properties screen opens.
9. Configure Scenario Properties, as desired.
10. Click Next. The Master and Replica Properties screen opens.
11. Configure Master or Replica Server Properties. Read Spool information in the *Arcserve RHA Administration Guide* before you change spool properties.
12. Click Next. Wait while scenario verification completes and the Scenario Verification screen opens. If any problems or warnings are displayed, you should resolve them before you run the scenario.
13. Click Next. The Scenario Run screen opens. You may choose Run Now to start synchronization immediately or Finish to save the scenario configuration and initiate synchronization later.

Create a New Custom Application High Availability Scenario

Before you begin this procedure, read the IP Redirection section and perform the necessary steps that correspond to your environment.

To create a new Custom Application High Availability scenario

1. Open the Manager and choose Scenario, New or click the New Scenario button from the toolbar.
The Welcome screen opens.
2. Choose Create a New Scenario, select a Group, and click Next.
The Select Server and Product Type screen opens.
3. Choose Custom Application, High Availability and click Next.

The Master and Replica Hosts screen opens.

4. Type a Scenario Name, enter the Hostname or IP Address and Port Number for the Master and Replica servers. Ensure the Verify Arcserve RHA Engine on Hosts option is enabled and click Next.

Wait for engine verification to complete. If required, click Install to upgrade the Engine on one or both servers and click Verify Again.

The Master Root Directories screen opens. Expand folders and select the data you wish to protect.

5. Click Next.

The Services Discovery Result screen opens. See [Manage Services](#) (see page 16) for information on completing the Services Discovery Result and Services Setting screens.

6. Click Next.

The Scenario Properties screen opens.

7. Accept the defaults or change Scenario Properties.

The Master and Replica Properties screen opens. These properties apply to only host servers. Accept the defaults or change values if needed. Wait for the Switchover Properties screen to retrieve information.

8. Set Network Traffic Redirection according to the information in the [Redirection](#) (see page 25) section and click Next.

The Switchover and Reverse Replication Initiation screen opens.

9. Choose your start options and click Next.

10. Resolve any errors or warnings and click Next.

11. Click Run Now to start synchronization and activate the scenario, or click Finish to save the scenario configuration and run later.

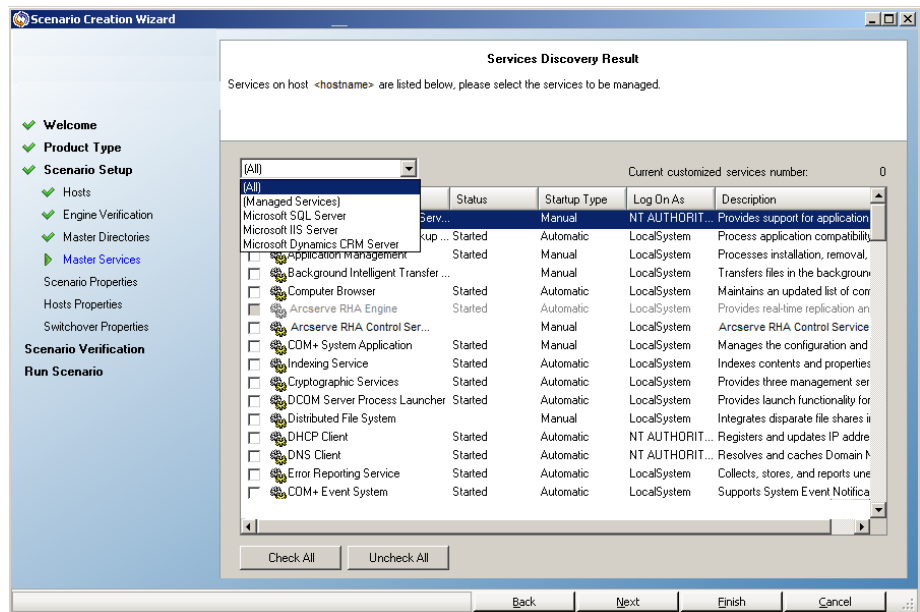
Manage Services

As part of scenario creation or modification, you can specify the services to manage. During scenario creation, the services management screens are displayed in the Scenario Creation Wizard. For existing scenarios, you can also manage services from the Arcserve RHA Manager Root Directories tab.

Services discovered on the specified Master server are automatically shown on the Services Discovery Result screen in the Scenario Creation Wizard.

The following steps are for Custom Application scenarios.

To manage services



- **All** - lists all services discovered on the Master server
- **Managed Services** - lists only the checked services
- **Oracle Database** - lists Oracle-related services if the current host has Oracle installed
- **Microsoft SQL Server** - lists SQL Server-related services if the current host has SQL Server installed
- **Microsoft IIS Server** - lists IIS Server-related services if the current host has IIS Server installed
- **Microsoft SharePoint Server** - lists SharePoint Server-related services if the current host has SharePoint Server installed
- **VMware vCenter Server** - lists vCenter Server-related services if the current host has vCenter Server installed

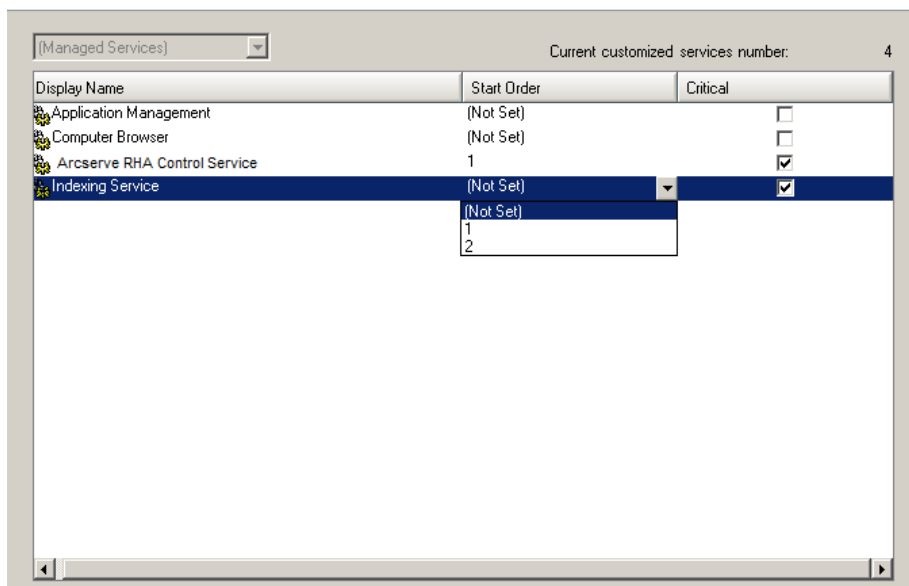
- **Microsoft Exchange Server** - lists Microsoft Exchange Server-related services if the current host has Microsoft Exchange Server installed
 - **Microsoft Dynamics CRM Server** - lists Microsoft Dynamics CRM Server-related services if the current host has Microsoft Dynamics CRM Server installed
1. Select a Service to Monitor. Click the box to the left of each service listed to select it for monitoring.

Important! Do not use Services Management to monitor every service on the Master server in a single scenario. This scenario type is not designed to protect an entire server.

2. Click Next to proceed to the Services Setting screen.

Services Setting

Managed services are listed below, please set the properties for each service.



3. In the Start Order column for each service you chose, specify the numeric value representing start order. For services where order does not matter, use the default value, (Not Set). The options available in the drop down list update as you configure the value. The first service has only two options: Not Set and 1. The second service has three options: Not Set, 1 and 2, and so on. If you assign the same start order to two services, Arcserve RHA automatically reorders the selections you already made.
4. In Replication scenarios, the Critical column is disabled. In HA scenarios, use the Critical column to specify if a service should trigger switchover when it fails. By default, all services are marked Critical. Clear the box for any service whose failure does not require switchover to the stand-by server.

Import Scenarios

You can import scenarios using an XML configuration file. (From the Arcserve RHA Manager, click Scenario, Import. Select Custom Application xml config (*.cxc), select the file name and then click Open.)

Specify the following values (they are not case-sensitive).

XML Version

User-defined, for example, 1.0.

Product Type

This value corresponds to the Product Type selection made in the Scenario Creation Wizard. "Dr" for Replication and Data Recovery Scenario. "Ha" for High Availability scenario. (Content Distribution is not supported.)

IsAR

Is this an Assured Recovery scenario? Set this value to "TRUE" to specify AR. Omit the line or set this value to false if you don't want to perform Assured Recovery.

ScenarioName

Provide a name for your scenario. If you omit this line, the default "customApp(1)" is used.

RootDirs and RootDir

The RootDirs object can have several child nodes. Specify root directory values for the data and application you wish to protect. If you omit this line, you must specify the root directories using the Arcserve RHA Manager.

ExcludePath_Filter

Specify the directory that should be excluded from the scenario.

FileRegExpr_Filter

Set the regular expression filter, "include=True", if you want to set the include filter, otherwise, Arcserve RHA sets the exclude filter.

ApplicationServices

(Required) This object can have several child nodes to configure multiple services.

Service

Specify the name of the service to monitor.

is_critical

(Optional) "True" for critical. "False" for not critical. Services set as critical trigger switchover if failed.

start_order

(Optional) Specify "1" for first, "2" for second.

Example

The example shows values in italics for a MySQL Custom Application scenario. In this example, the data is stored in C:/MySQL/data and the application files are stored in C:/Program Files/MySQL/MySQL Server 5.1. The service, MySQLDemo, is marked critical, which means Arcserve RHA will trigger the switchover process if this service fails because this is an HA scenario.

```
<?xml version="1.0"?>
<CustomApplication >
  <Product val="Ha"/>
  <IsAR val="True"/>
  <ScenarioName val="Demo_scenario"/>
  <RootDirs>
    <RootDir val="C:/MySQL/data">
      <ExcludePath_Filter val="aaa"/>
      <ExcludePath_Filter val="bbb"/>
    </RootDir>
    <RootDir val="C:/Program Files/MySQL/MySQL Server 5.1">
      <ExcludePath_Filter val="ccc"/>
      <ExcludePath_Filter val="" />
    </RootDir>
    <FileRegExpr_Filter include="True" val="*.txt bbb ccc?.doc hhh" />
  </RootDirs>
  <ApplicationServices>
    <Service val="MySQLDemo" is_critical="True" start_order="1"/>
    <Service val="SQLTest" is_critical="False" start_order="2"/>
  </ApplicationServices>
</CustomApplication>
```

Use Scenario Groups

Each scenario is assigned to a default scenario group called Scenarios. You can use this group for all scenarios you create, or you can add new groups to organize your scenarios according to your own criteria. Scenario groups are displayed on both the Manager and the Overview Page.

In distributed server environments, in which several servers (database server, application server, web front end server) comprise the environment, you must create individual scenarios to protect all the servers in the deployment. If an Is Alive check triggers switchover, only the affected server is failed over to its Replica. The resulting data split, where some operations are applied to original Master servers and other operations are applied to the Replica in the failed scenario, can introduce performance issues.

Scenario groups let you manage related scenarios, such as those protecting all servers in a distributed environment, as a single entity. For example, for end-to-end protection in a distributed server environment, you may have a SQL scenario to protect the database component, and several application-specific scenarios to protect application servers. A scenario group lets you set switchover properties at the group level, instead of at individual server levels.

For more information, see [Enable Scenario Group Management](#) (see page 21).

Enable Scenario Group Management

Scenario Group Management lets you manage related HA scenarios as a single entity. Switchover can be configured so that when one server fails, all servers in the scenario group switch over at once, alleviating the data split issue. Scenario Group Management applies only to high availability scenarios.

Note: You must manually create the required scenarios, assign each to the same group, and enable group management.

To enable Scenario Group Management

1. From the Manager, right-click the name of any HA scenario in the group you wish to manage centrally.
2. From the short-cut menu, click Enable Scenario Group Management.
A confirmation message appears.
3. Click OK to continue.
4. Click the Properties tab and expand the Switchover Settings properties group.
5. If you want to switch over the whole group as a single entity, set the Switchover as a Group property to On.
6. Expand the Failure Triggers Group Switchover property and set the value to On for each scenario in the group that should trigger switchover when it fails.
7. Expand the Scenario Availability Sets property. If all servers listed in this property fail, the entire group switches over. Add the names of the scenario group that you wish to monitor and then select the scenarios in that group that will trigger group switchover.

Create Custom Application Scenario Groups

There are two ways to create a scenario group:

- During the creation of a new scenario, through the Scenario Creation Wizard.
- Before the scenario creation, through the New Group option, as described below.

Note: We recommend planning and creating the scenario groups you want to use in advance. After you assign a scenario to a certain group, you cannot move it to another group.

To create a new scenario group

1. From the Manager, click Scenario, New Group from the menu, or click the New group button on the Standard toolbar.

A New group folder is added to the Scenario pane.

2. You can change the group's name by right-clicking it and selecting Rename from the pop-up menu, or by double-clicking the current name and entering a new name.

The new group name appears on the following places: the Scenario pane, the Group drop-down list in the Scenario Creation Wizard, and the Overview Page.

Note: When no scenario is defined, empty scenario groups do not appear on the Overview Page.

Set Scenario Group Properties

When you create a scenario, you can configure the group properties using the Scenario Creation Wizard.

The group properties include:

- **Scenario Dependencies** -- Manages the interdependencies between scenarios. Usually a distributed application has multiple components/roles/servers that are interdependent. Any scenario can be configured to depend on one or more scenarios or multiple scenarios can depend on a single scenario. These services can be handled by the Scenario Dependencies property.
- **Switchover Settings** -- Manages the switchover setting in a distributed group. Some of the switchover setting options include:
 - Switchover as a Group: If this option is set to On, the whole group (all the scenarios) will be automatically switched over together in case one of the scenarios is failed and ready to take switchover.
 - Failure Triggers Group Switchover: A single failure can trigger a group switchover. By default, all scenarios can trigger group switchover, and you can configure some light-weight scenarios to be set to Off.
 - Execute Scenario Switchover Settings: This option decides whether the scenario should execute its own switchover settings.
- **Scenario Availability Sets** -- A distributed application might configure two or more servers to provide same services to improve availability or performance. When one server is down, the other servers are still working and can still provide the services. Scenario Availability Set will be used when Arcserve RHA manages these servers/scenarios of that distributed application.

If two scenarios are configured in the same Scenario Availability Set, the group switchover is initiated only when both scenarios fail. This function is not invoked when one of the options fail.

Note: The same group can have one or more Scenario Availability Sets, but one scenario cannot be configured in two different sets.

Run a Scenario Group

Before you can run a scenario group, Arcserve RHA performs a pre-run verification of each scenario in the group and reports any errors or warnings. Each scenario in the group must pass verification for the group to run.

To avoid SQL Server connection errors, make sure the Master and Replica servers use the same port, or make sure the SQL Server service is running as a local system, which sets SPN properly.

To run a scenario group

1. When pre-run verification is successful, click Run Now to run the whole group.

The Run dialog opens.

2. Choose a synchronization method and click OK. By default, the synchronization method for the group is set to use the method selected for each individual scenario within it. Or, you may apply a method to all scenarios.

The status for all scenarios in the group changes to Running.

Stop a Scenario Group

You must stop a group that is currently running if you want to add or remove scenarios. To stop a group, you must stop all scenarios in that group. Click Stop on the Manager toolbar for each scenario in sequence. There is no failure recorded by stopping scenarios.

Chapter 3: Redirection

There are three redirection types plus the option to use custom scripts. Redirection is covered in detail in the Arcserve RHA Administration Guide. In general, application and scenario type govern what redirection method to use, but for Custom Application scenarios, you must determine the method to use based on how your environment is configured.

The following sections describe the supported redirection methods.

- [Move IP Redirection](#) (see page 25)
- [DNS Redirection](#) (see page 30)
- [Switch Computer Name Redirection](#) (see page 30)
- [Scripts Redirection](#) (see page 31)

This section contains the following topics:

[Move IP Redirection](#) (see page 25)

[DNS Redirection](#) (see page 30)

[Switch Computer Name Redirection](#) (see page 30)

[Scripts Redirection](#) (see page 31)

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, see 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 *Arcserve-IP* in the following steps) to use Move IP redirection in your HA scenarios. This new IP address is used for Arcserve RHA 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.

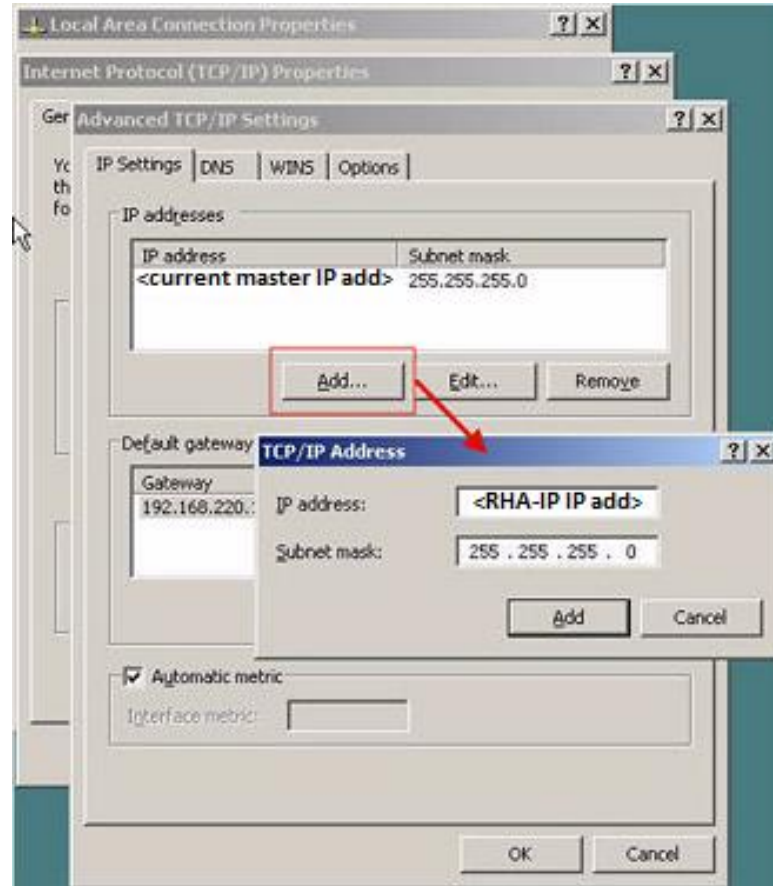
Important! Perform the following only if you are using the Move IP redirection method.

To add IP Address to Master Server

1. Open the Control Panel and select Network Connections.
2. Right-click Local Area Network and select 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 (Arcserve-IP).

In the following screenshot, the Arcserve-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 Arcserve-IP to your HA scenarios. There are two ways to add the Arcserve-IP address to an HA scenario:

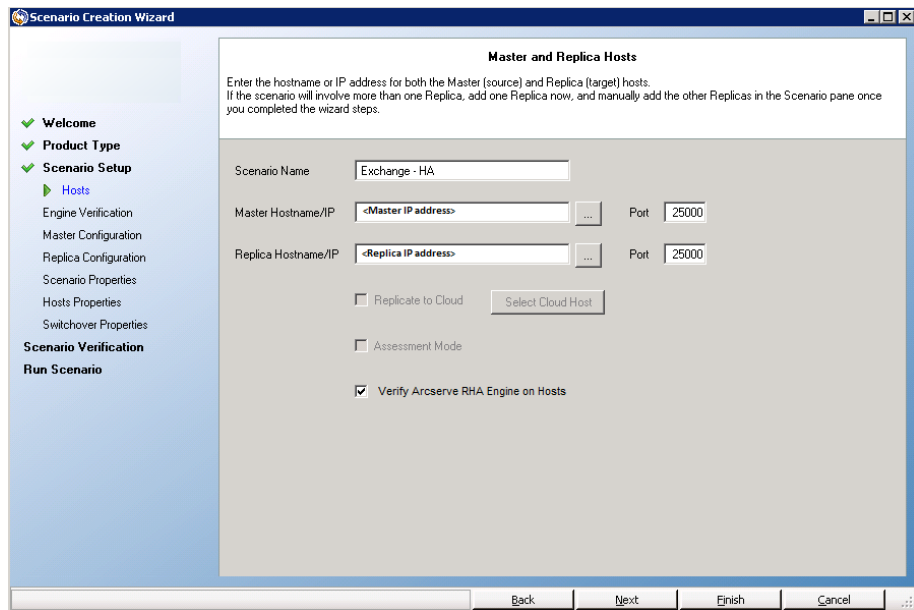
- For new scenarios, from directly in the Wizard
- For existing scenarios, by modifying the master host name

The procedures for both ways follow.

Add Arcserve-IP to New Scenarios

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

During the initial run of the Scenario Creation Wizard, enter the Arcserve-IP and Replica IP addresses in the Master Hostname/IP and Replica Hostname/IP boxes, instead of the server names.

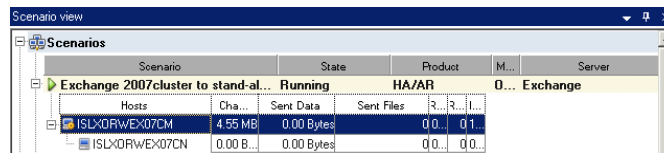


Add Arcserve-IP to Existing Scenarios

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

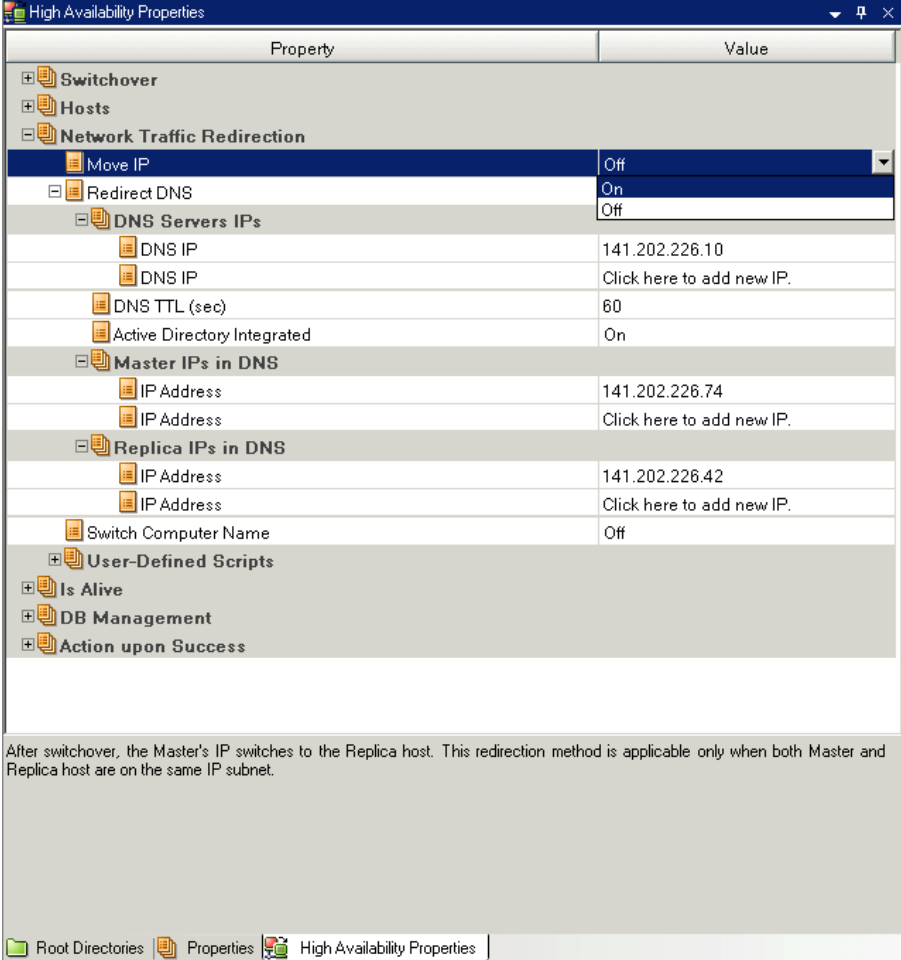
To add the Arcserve-IP to existing scenarios:

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 Arcserve-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**:



The screenshot shows the 'High Availability Properties' dialog box. The 'Network Traffic Redirection' section is expanded, and the 'Move IP' property is set to 'On'. Below it, the 'Redirect DNS' property is also set to 'On'. The 'DNS Servers IPs' section is expanded, showing a 'DNS IP' of 141.202.226.10 and a 'Click here to add new IP.' link. The 'Master IPs in DNS' section is expanded, showing an 'IP Address' of 141.202.226.74 and a 'Click here to add new IP.' link. The 'Replica IPs in DNS' section is expanded, showing an 'IP Address' of 141.202.226.42 and a 'Click here to add new IP.' link. The 'Switch Computer Name' property is set to 'Off'. The 'User-Defined Scripts' section is expanded, showing 'Is Alive', 'DB Management', and 'Action upon Success' properties.

Property	Value
Move IP	On
Redirect DNS	On
DNS Servers IPs	Off
DNS IP	141.202.226.10
DNS IP	Click here to add new IP.
DNS TTL (sec)	60
Active Directory Integrated	On
Master IPs in DNS	
IP Address	141.202.226.74
IP Address	Click here to add new IP.
Replica IPs in DNS	
IP Address	141.202.226.42
IP Address	Click here to add new IP.
Switch Computer Name	Off
User-Defined Scripts	
Is Alive	
DB Management	
Action upon Success	

After switchover, the Master's IP switches to the Replica host. This redirection method is applicable only when both Master and Replica host are on the same IP subnet.

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 Arcserve RHA to redirect any DNS A (host) record via the *Master's name in DNS* setting in the switchover properties tab.

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. To use Switch Computer Name Redirection in the Active Directory environment, both Master and Replica must belong to the same domain or trusted domains.

It is also recommended to enable one other method. The most common method is to use both DNS Redirection and Switch Computer Name. Arcserve RHA 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.

Arcserve RHA 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 computer 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, Arcserve RHA renames the master host to *masterhostname-RHA* and assigns its original name to the replica server. This step prevents name conflict, since the master's name is now assigned to the replica server. In this graceful case, if automatic reverse replication is set to on, Arcserve RHA 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 Perform Switchover to switch back.

Scripts Redirection

Arcserve RHA 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, see the *Arcserve RHA Administration Guide* for details on scripted redirection methods.

Chapter 4: 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 Arcserve RHA 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 Arcserve RHA Manager.

This section contains the following topics:

[How Switchover and Switchback Work](#) (see page 33)

[Initiate Switchover](#) (see page 35)

[Initiate Switchover for a Group](#) (see page 36)

[Initiate Switchback](#) (see page 37)

[Initiate Switchback for a Group](#) (see page 39)

[Recover Active Server](#) (see page 40)

[Recover Active Server for a Distributed Group](#) (see page 41)

[Switchover Considerations](#) (see page 41)

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. There are three types of monitoring checks:

- **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 and SharePoint websites are started.
- **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, Arcserve 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.
- 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. Server ping response, application service status, and database connectivity are monitored. The timeout parameters are configurable and are more extensively covered in the *Arcserve RHA Administration 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, one the original Master server becomes available again.
- If you selected the Initiate Reverse Replication manually option, you need to perform switchback manually. If you select the manual option and do not initiate a manual switchback, 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.

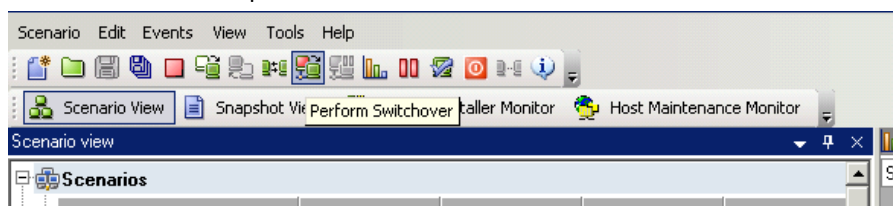
Initiate Switchover

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.

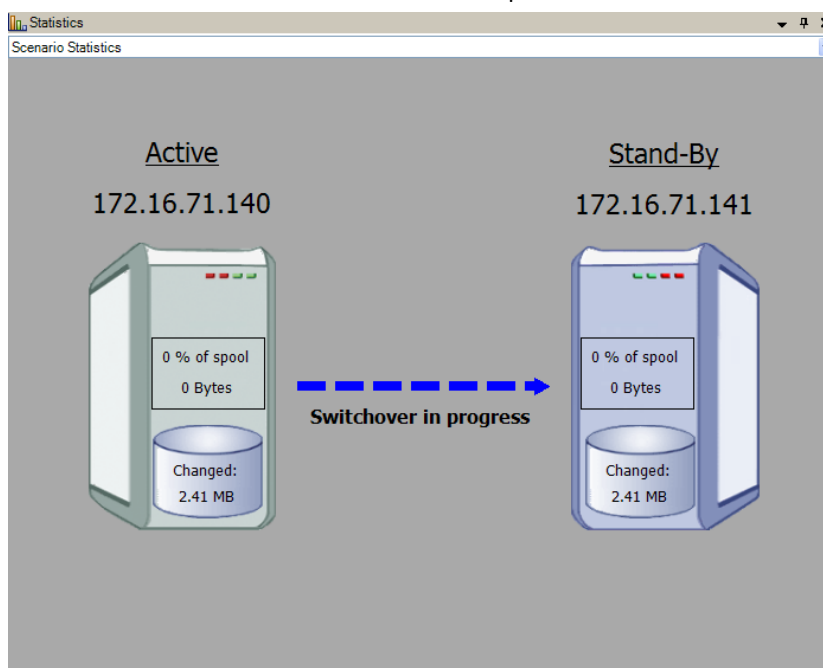
To initiate manual switchover

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:



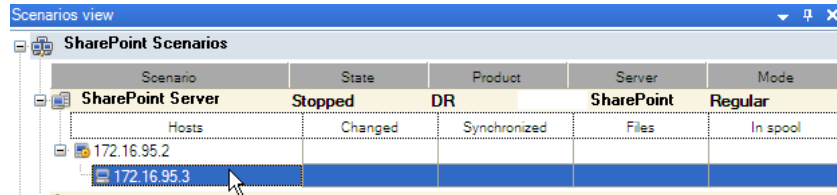
A confirmation message appears.

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:



Scenario	State	Product	Server	Mode
SharePoint Server	Stopped	DR	SharePoint	Regular
Hosts				
172.16.95.2	Changed	Synchronized	Files	In spool
172.16.95.3				

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 passive and the Replica becomes active.

Initiate Switchover for a Group

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

To initiate switchover for a group

1. Open the Manager and select the group from the Scenario pane. Verify if it is running.
2. Click Perform Switchover.

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. The operation stops when the switchover completes.

Detailed information about the switchover process is located in the Events pane during switchover. A message appears in the Event pane, informing you that the switchover is completed, and that the scenarios in the group have stopped. Now, the Master becomes passive and the Replica becomes active.

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, a backward scenario.

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

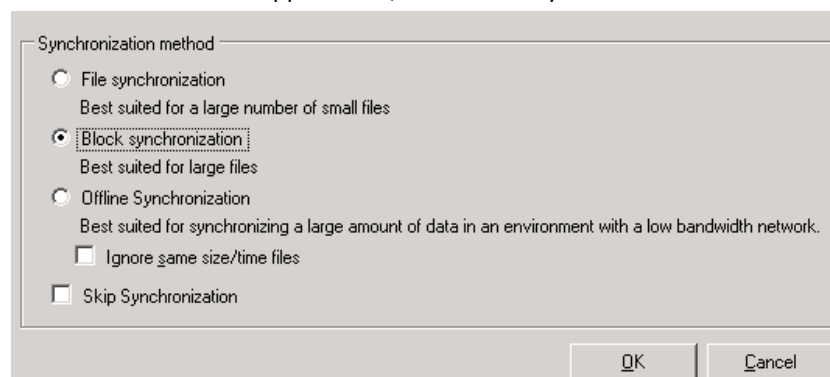
To initiate manual switchback

1. Ensure that both Master and Replica servers are available on the network and that the Arcserve RHA 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.

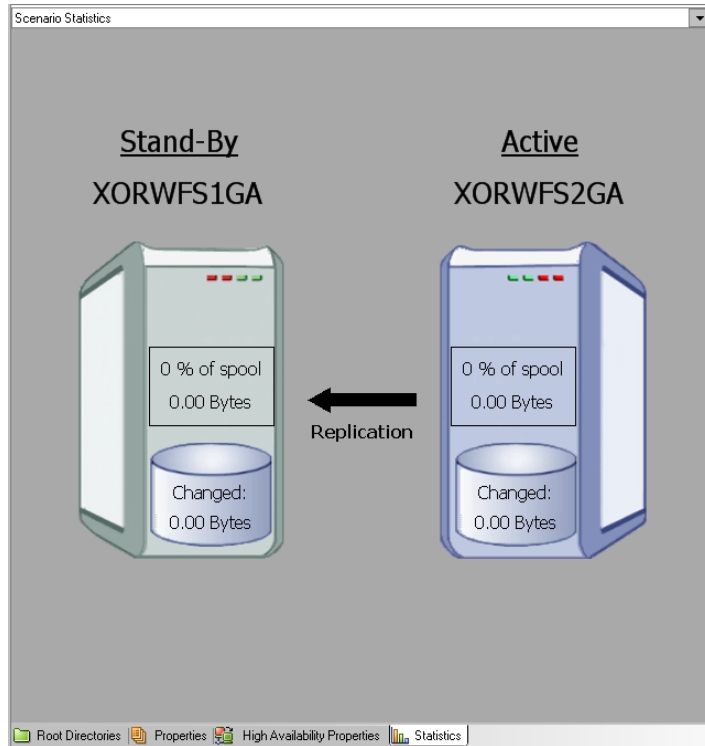
Arcserve HA detects that a switchover has occurred and verifies its state and configuration. After verification completes, the Verification Results dialog appears, listing existing errors and warnings if detected, and prompting you to approve the running of the backward scenario. If desired, click the 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: For Custom Applications, select Block synchronization.



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.

Initiate Switchback for a Group

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, a backward scenario.

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

To initiate switchback for a group

1. Ensure that both Master and Replica servers are available on the network and that the Arcserve RHA Engine is running.
2. Open the Manager and select the desired group 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 group.

Arcserve RHA 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 group. If desired, click the Advanced button to open an additional pane with detailed information about the hosts that participate in the group.
 - b. Select Block synchronization method from the Run dialog and click OK.

Resynchronization starts. After resynchronization completes, the message, "All modifications during synchronization period are replicated. Now, replication from the active server to the standby server begins" appears in the Event pane. You can now 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.

Recover Active Server

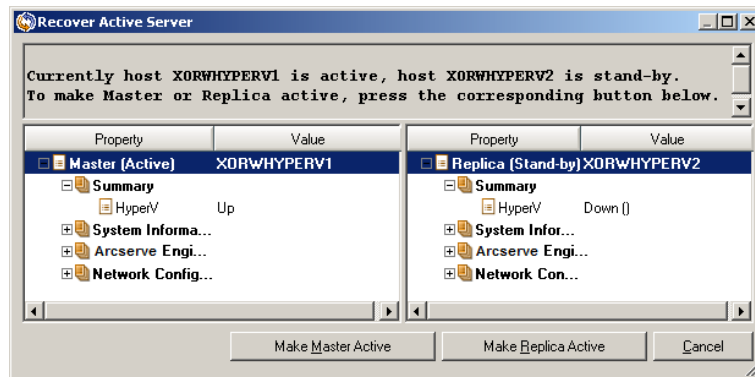
In certain circumstances, it may be necessary to forcibly make the Master or Replica server the active server without completing the data synchronization process.

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. Arcserve RHA allows Recover Active Server process, to use this option. You must 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. Usually, Arcserve RHA 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, Arcserve RHA 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.

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.

Recover Active Server for a Distributed Group

You can also forcibly make the Master or Replica server the active server without completing the data synchronization process for a group. This recovery process is used to resolve data split problems. For more information about data split, see Microsoft documentation.

To recover the Active Server for a Distributed Group

1. Ensure all scenarios are stopped.
2. Select the group node in the Manager and select Recover Active Server from the Tools menu.

The group node performs verification, and lists the results of each scenario in a row.

Note: You must consider the different types of scenarios before performing the recovery process. For all scenarios running on the server to be recovered, note which servers are active. Decide which servers you wish to force into the active role.

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

If the Recover Active Server method does not solve the problem, you can manually recover a server. For more information, see Recovering Servers.

Switchover Considerations

To prevent overwriting data, the best practice is to set *either* the Switchover or the Reverse Replication Initiation property to Automatic. If a server fails while both properties are set to Automatic, Arcserve RHA triggers Switchover without administrative involvement and could start Reverse Replication before you have investigated the cause of the failure. During Reverse Replication, Arcserve RHA overwrites data on your production server.

If a crash or outage occurs during switchover, you may need to perform the Recover Active Server procedure.

Chapter 5: Recovering Data

This section contains the following topics:

- [The Data Recovery Process](#) (see page 43)
- [Recover Lost Data from Replica](#) (see page 43)
- [Setting Bookmarks](#) (see page 45)
- [Data Rewind](#) (see page 46)

The Data Recovery Process

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

Arcserve RHA 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 to initiate recovery.

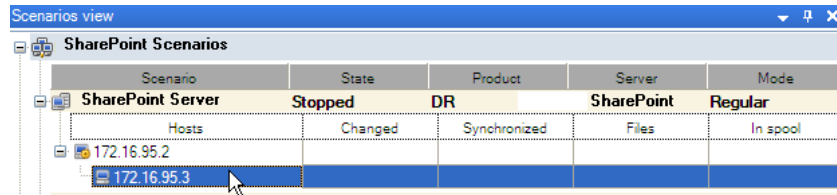
Recover Lost Data from Replica

In the following steps, File Server scenario screens are used as examples, but the procedures are similar for all server types.

To recover lost data from a Replica

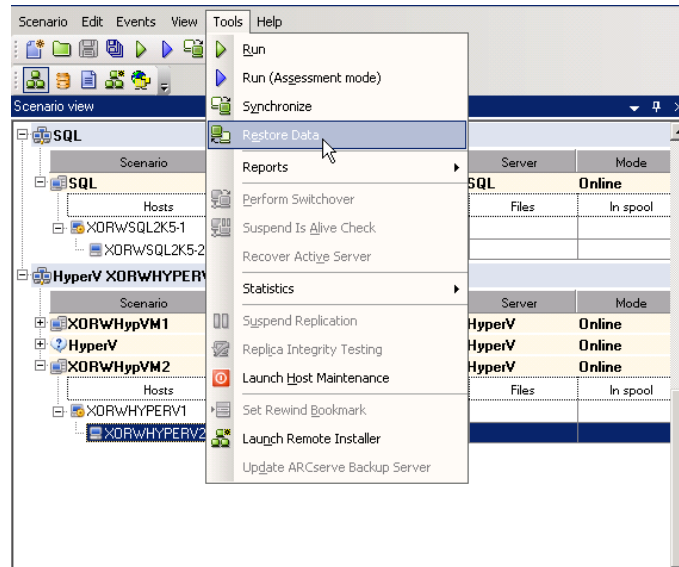
1. On the Manager, from the Scenario pane select the desired scenario and stop it.
2. On the Manager, from the scenario folder select the Replica host:

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



- From the **Tools** menu, select **Restore Data**, or click the **Restore data** button on 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 appears, asking you to enter log on 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.

- Click **Next**. The **Synchronization Method** page appears.
- Ensure that the appropriate Synchronization method is selected. For more details, see the Arcserve RHA Administration Guide. Click **Finish**.

Once you finished initiating the recovery process, Arcserve RHA 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.

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

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

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. For Custom Application high availability, Volume Shadow Copy Service (VSS) technologies are used to create bookmarks. This helps you ensure that all data (databases and search index files) is in a consistent state at the time the bookmark is generated.

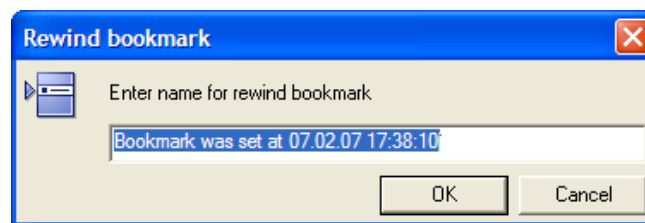
Notes:

- You can use this option only if you set in the Replica Properties list the **Recovery - Data Rewind** option to **On**.
- You cannot set bookmarks during the synchronization process.

To set a bookmark

1. When the required scenario is running, select **Tools, Set Rewind Bookmark**.

The **Rewind bookmark** dialog appears:



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.

2. 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.

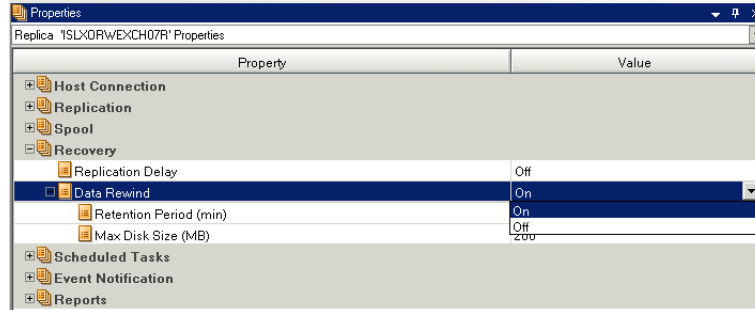
The bookmark is set.

Note: Any errors will be displayed in the Event View on the Control Manager.

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**:



If this option is set to Off, the system will not register data rewind points. For more information about Data Rewind parameters (Retention Period, Max Disk Size), see the *Arcserve RHA Administration Guide*.


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. In the following example, a File Server scenario is used, but the steps are the same for all scenario types.

To recover lost data using rewind points

1. On the Manager, from the Scenario pane select the desired scenario and stop it.
2. [For database applications only] stop the database services on the Master host.
3. 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.

4. 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.

5. 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.

6. Click **Next**. The **Rewind Point Selection** page is displayed.
7. 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.

Note: If the **Select Rewind Points** dialog is empty, ensure that the **Data Rewind** property is enabled.

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

Note: If you want to use a Bookmark as the rewind point, select the closest rewind point that indicates an actual event. However, it is best practices for a SharePoint recovery to select a bookmark as a rewind point. Using a bookmark ensures all SharePoint data is in a consistent state.

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

9. Click **Next**. The **Synchronization Method** page is displayed.

10. 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.

Arcserve RHA 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, Arcserve RHA starts a synchronization process from the Replica to the Master. Once the process ends, the temporary Recovery scenario is stopped and then deleted.

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

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

Chapter 6: Additional Information and Tips

This section contains the following topics:

[UNIX/Linux](#) (see page 49)

[PowerShell](#) (see page 49)

UNIX/Linux

Custom Application Scenarios are not supported on UNIX/Linux platforms.

PowerShell

In this release, Custom Applications Scenarios cannot be configured using PowerShell commands. However, once configured, Custom Applications can be started and stopped with PowerShell commands.