

WANSynchA® Oracle Server™

WANSynchA Oracle Server Operations Guide



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Chapter 1: Getting Started

WANSyncHA for Oracle is a high availability solution based on asynchronous real-time replication and automated application switchover and switchback to provide cost-effective business continuity for Oracle on both 32- and 64-bit Windows servers.

WANSyncHA offers push-button or fully automatic switchover of mission-critical database servers over a LAN or WAN, Oracle-aware status monitoring, integrated continuous data protection as a guard against data corruption, and completely non-disruptive automatic testing of your Oracle high availability solution, all in a system that sets the standard for ease of configuration and management.

The flow of data is the heart of any organization and Oracle has become a central part of the modern business infrastructure for data storage and management. If disaster should strike, whether in the form of a hurricane, a blackout, or far more likely, a virus attack or software or user error, your ability to respond well to the crisis can make the difference between a bright future and the end of your business. At the very least, you are likely to incur significant costs in lost business and, perhaps more importantly, lost confidence by your customers, investors, and other stakeholders. Oracle disaster recovery is not just about insurance. It is about maintaining your competitive edge. WANSyncHA is designed to give you that edge.

About this Guide

This document describes how to implement a high availability solution for Oracle 8i, 9i or 10g using WANSyncHA. Please review each procedure before starting. It is essential that you have the appropriate resources and permissions to carry out each task.

Related Documentation

Use this guide along with the *WANSync User Guide*.

Requirements

This section describes the requirements for running WANSyncHA for Oracle.

Infrastructure

To implement high availability with WANSyncHA for Oracle, you must have/implement the following:

- Two servers running Windows Server 2000 or 2003
 - Both servers should have the same level of service packs and hot fixes installed
- Both servers should have the same Oracle version, service packs and hot fixes installed
- The Oracle SID must match between the master and replica servers
- On both servers, ensure that all Oracle Services normally started at boot have been successfully started and are set to Automatic Startup
- The path to ORACLE_HOME directory and the path to the database files on the master and replica servers must be identical
- To minimize replication traffic, Oracle temporary tablespace(s) are excluded from replication (make sure that the Oracle database on the replica server is configured with the same temporary tablespace names and path as is used on the master server)
- On both servers, configure Oracle to mount the database automatically on service startup (`oradim -edit -sid ORACLE_SID -startmode auto`)
- Statically assign all IP addresses (DHCP-assigned IP addresses on the master or replica server are not supported)
- The protected server is not a domain controller or DNS server.

Log On Account

The WANSyncHA service log on account must satisfy all of the following conditions:

- 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.

Important! If your company's security policy requires more granular permissions than described, please contact technical support to receive detailed instructions.

Non-Intrusive Installation

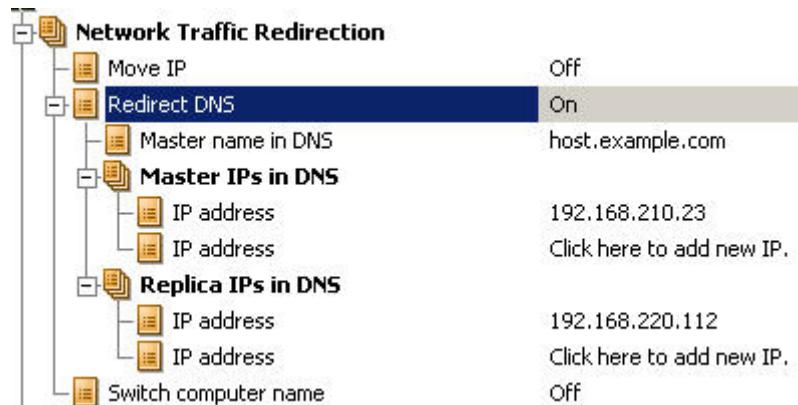
During installation and configuration of WANSynchA, Oracle on the master server continues working without any interruption.

Determining Which Redirection Method to Use

There are three ways in which you can redirect clients after switchover: Redirect DNS, Move IP, and custom scripts. You can use each method alone or you can use them in any combination.

This preferred method works in most network configurations (LAN and WAN). In DNS redirection, upon failure of the master, the replica server modifies the appropriate DNS record so that references to the Oracle server resolve to the replica's IP address rather than the master's IP address. This solution is the easiest to implement and requires no network reconfiguration. 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 WANSynchA to redirect any DNS A (host) record via the *Master's name in DNS* setting in the switchover properties tab.



- **Move IP.** This redirection method 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. If you want to use Move IP, please see *Move IP Redirection* before configuring the replication scenario.
- **Custom Scripts.** WANSynchA can trigger custom scripts or batch files to perform the user redirection or any additional steps not covered by built-in methods. If the above methods are not appropriate or do not fully meet all requirements, please see the *WANSync User Guide* for details on scripted redirection methods.

Oracle Servers Operating in a Workgroup

For servers in a workgroup, set the XoSoft Engine service account to a user that's a member of the local Administrators group. Servers in a workgroup can use Redirect DNS only with DNS servers that allow non-secure updates. You can use Move IP, switch computer name, and custom redirection scripts normally.

License Keys

When first opening WANSync Manager, it prompts for a license key. This key determines what scenario types and features are available. To simplify key installation, you can paste the entire key directly into the first text box. Subsequent text boxes are filled automatically. After opening the Manager, you can view and apply license keys from the *Help, About* menu.



WANSyncHA Components

WANSyncHA is comprised of the following components:

- **XoSoft Engine.** WANSyncHA's service - runs on each server involved in the scenario.
- **WANSync Manager.** Management GUI - used to manage and configure WANSyncHA.

XOsoft Engine

The XOsoft Engine is the executable file that lies at the heart of the WANSynchA system. It is installed on every host participating in replication and must be running before any replication scenario can run. Each engine can act as a master or replica with respect to each replication procedure or *tree*. It can also participate in more than one replication tree, as long as the file system directories, to which the different replication procedures are applied, don't overlap one another. WANSynchA runs as a daemon system service on Unix and communicates via default TCP port 25000 (you can change the default port number).

WANSync Manager

The Manager is a graphical user interface (GUI) application that controls all replication hosts, both in the definition and operation (running) of replication services. The offline process is mainly the definition of replication scenarios. Once a replication scenario is sent to the participating hosts, the Manager also provides the means for online control (running, synchronizing, etc.) and monitoring (i.e., node status, log files, etc.). You can operate the WANSync Manager from any location from which connections are established to WANSynchA hosts.

Note: The Manager connects as a TCP client to master and replicas defined in the replication scenario. Once a replication process is running, the Manager is no longer required for the process to continue. Connection to replica hosts is not mandatory - it is required only in order to enable selection of destination directories via browsing, instead of manually. Connection to the master host is mandatory.

Chapter 2: Server Setup

This chapter describes the most common setup for WANSyncHA for Oracle Servers.

Install WANSync Manager

Install WANSync Manager and the Remote Installation Wizard onto the machine from which the WANSyncHA scenario will be configured. The location of the Manager is not critical so long as it is accessible in the event of a disaster. Frequently, the Manager is installed on an administrative workstation.

Note: If the Manager is installed directly on either the master or replica servers, ensure that the XOsoft Engine is also installed.



If you intend to use the XOsoft Remote Installer (recommended), the machine on which you are running the remote installer must have the .Net framework 2.0 installed. The framework is required only on the machine running the remote installer wizard (GUI); the target servers do not have this requirement.

After the scenario is run it is cached on your master and replica servers. Once cached, you can download it to any installed WANSync Manager by selecting *Download* from the File menu (then enter the name of your master or replica server).

Prepare the servers

The following subsections describe how to prepare Oracle servers for use with WANSyncHA.

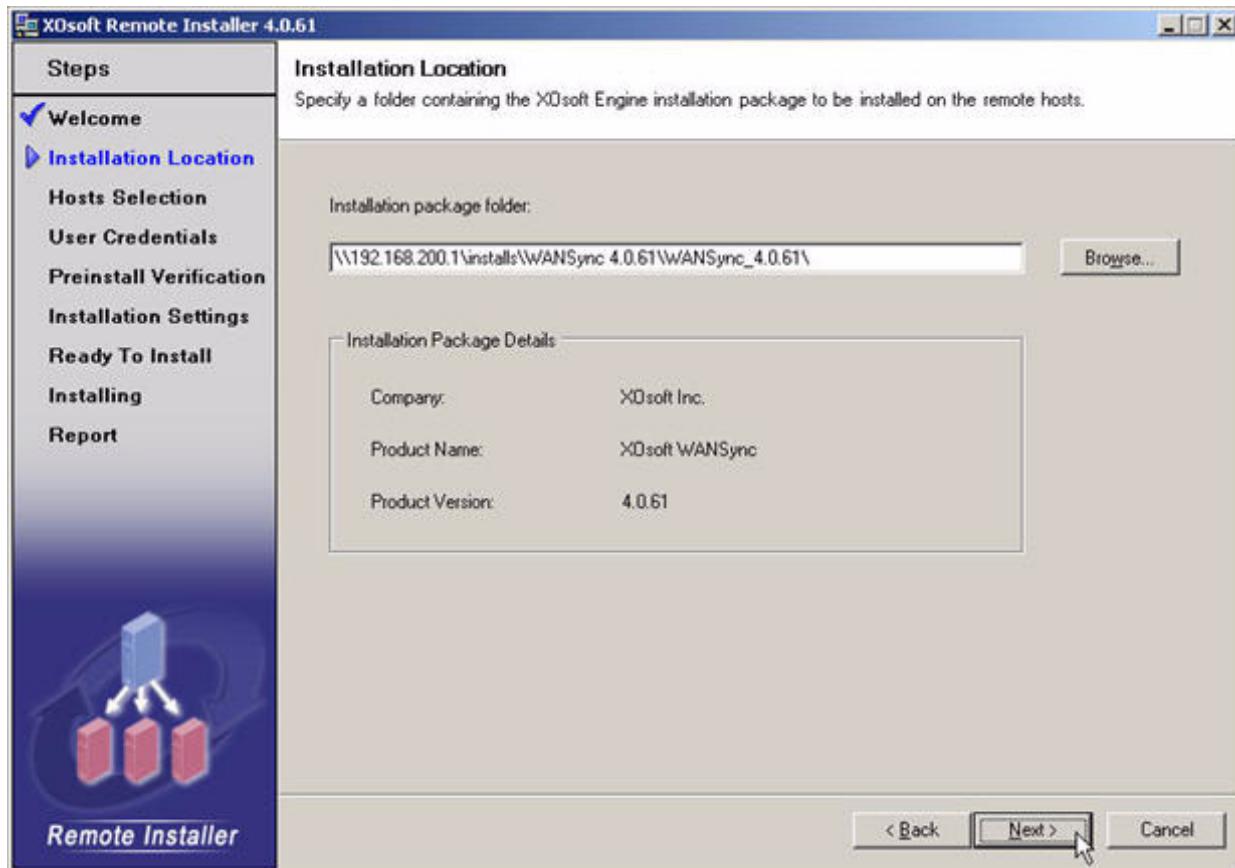
Remote Installation Wizard

You can use the Remote Installation Wizard to deploy the XOsoft Engine to any number of servers in one step. Alternatively, you can install the XOsoft Engine manually by running setup.exe directly on each server.

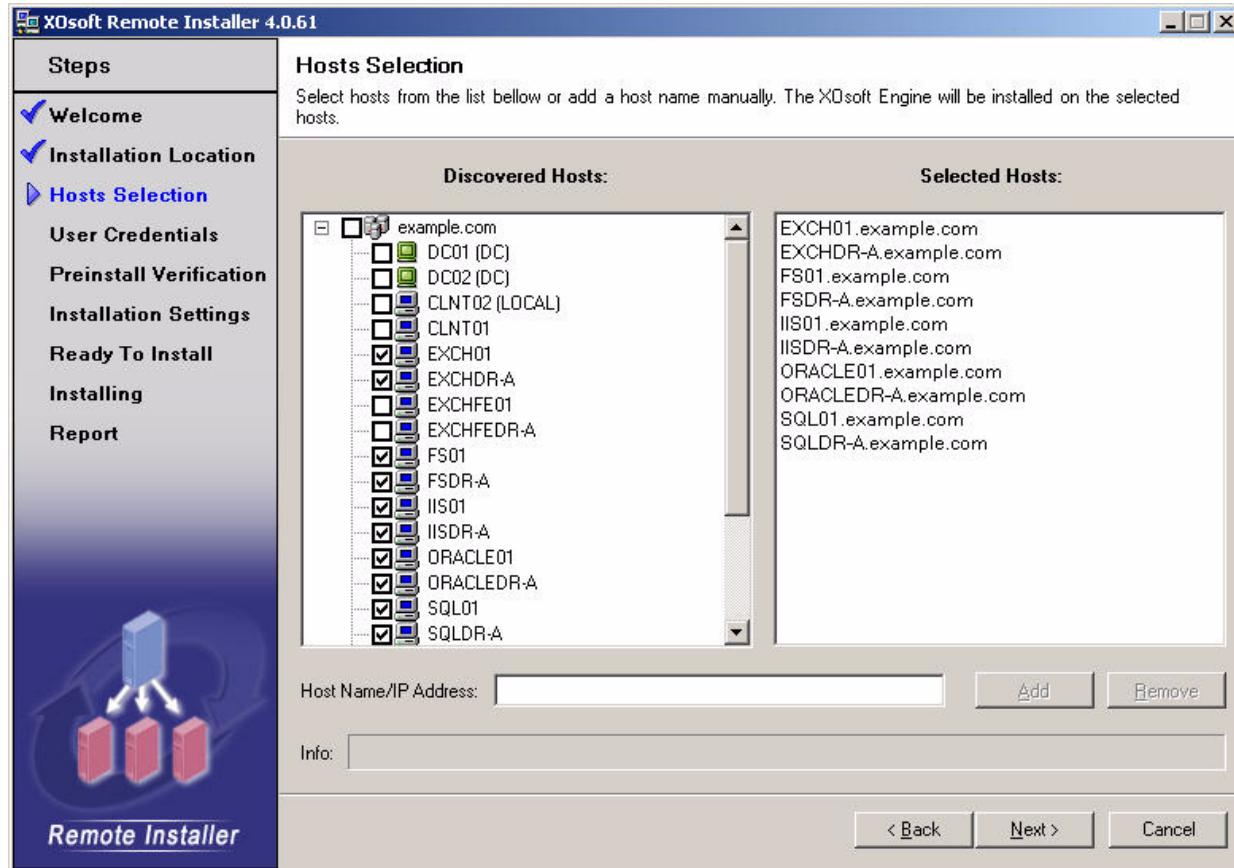
Note: If you install the XOsoft Engine using the remote installation wizard, you can skip the manual installation step under the sections *Master Server* and *Replica Server*.

Run the remote installation wizard either from the start menu or from the WANSync Manager Tools menu. When using the remote installation wizard, consider the following steps:

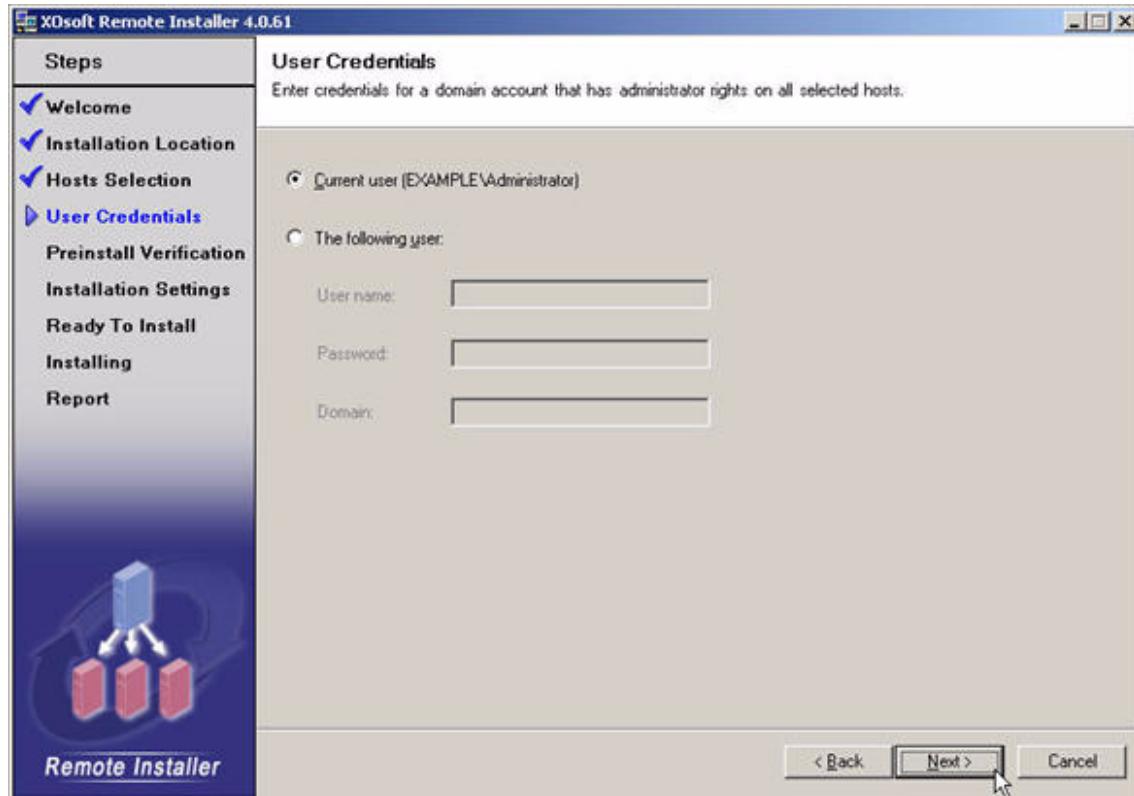
- **Installation location** - ensure that this path is correct and contains a valid WANSyncHA setup package



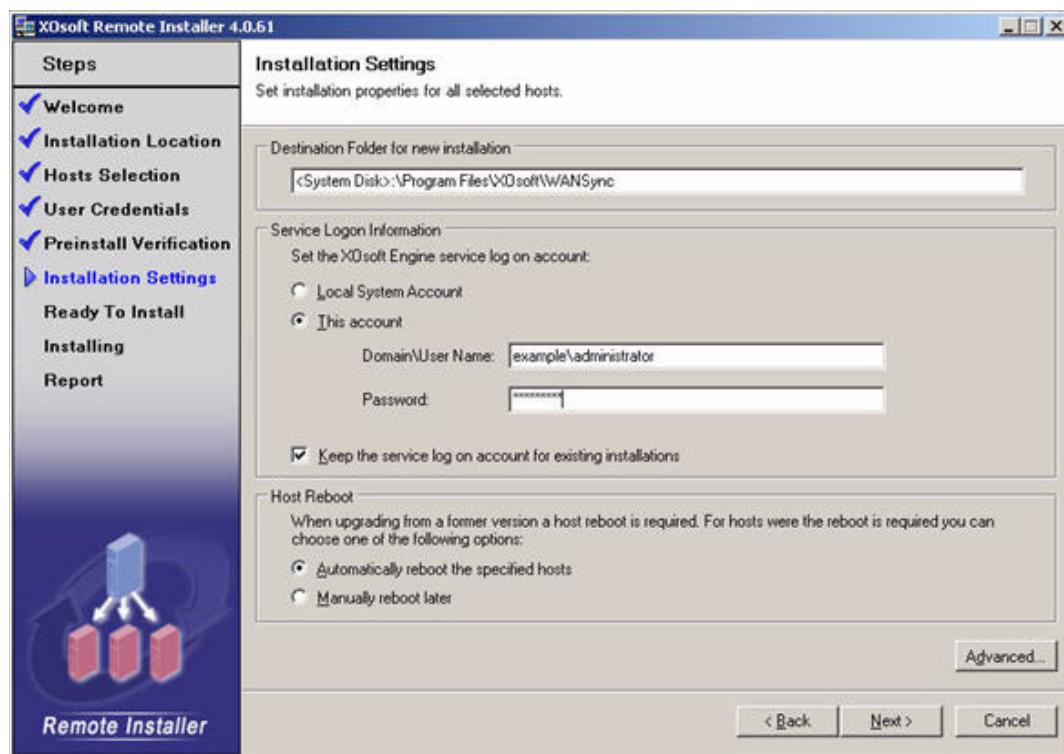
- **Hosts selection** - select the servers nodes to which you want to deploy the Xosoft Engine (you can add servers manually from the *Host Name/IP Address* box)



- **User credentials** - the user account that is used to install the XOsoft Engine on each target server (ensure that this account is a local Administrator on all target machines)

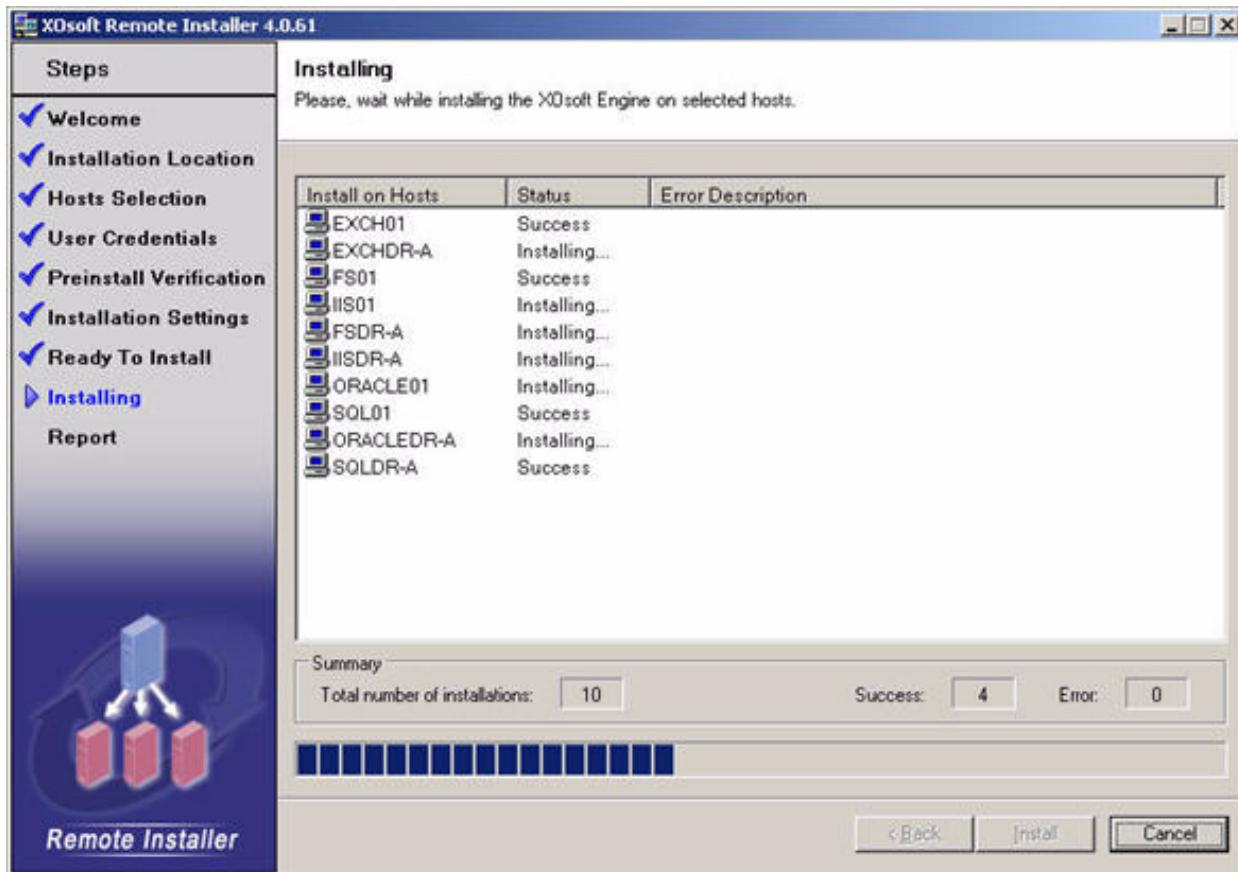


- **Preinstall verification** - click Next after all servers have reported success
- **Installation settings** - select *This Account* and enter the WANSyncha service account domain\username and password (see *Requirements* for more details)

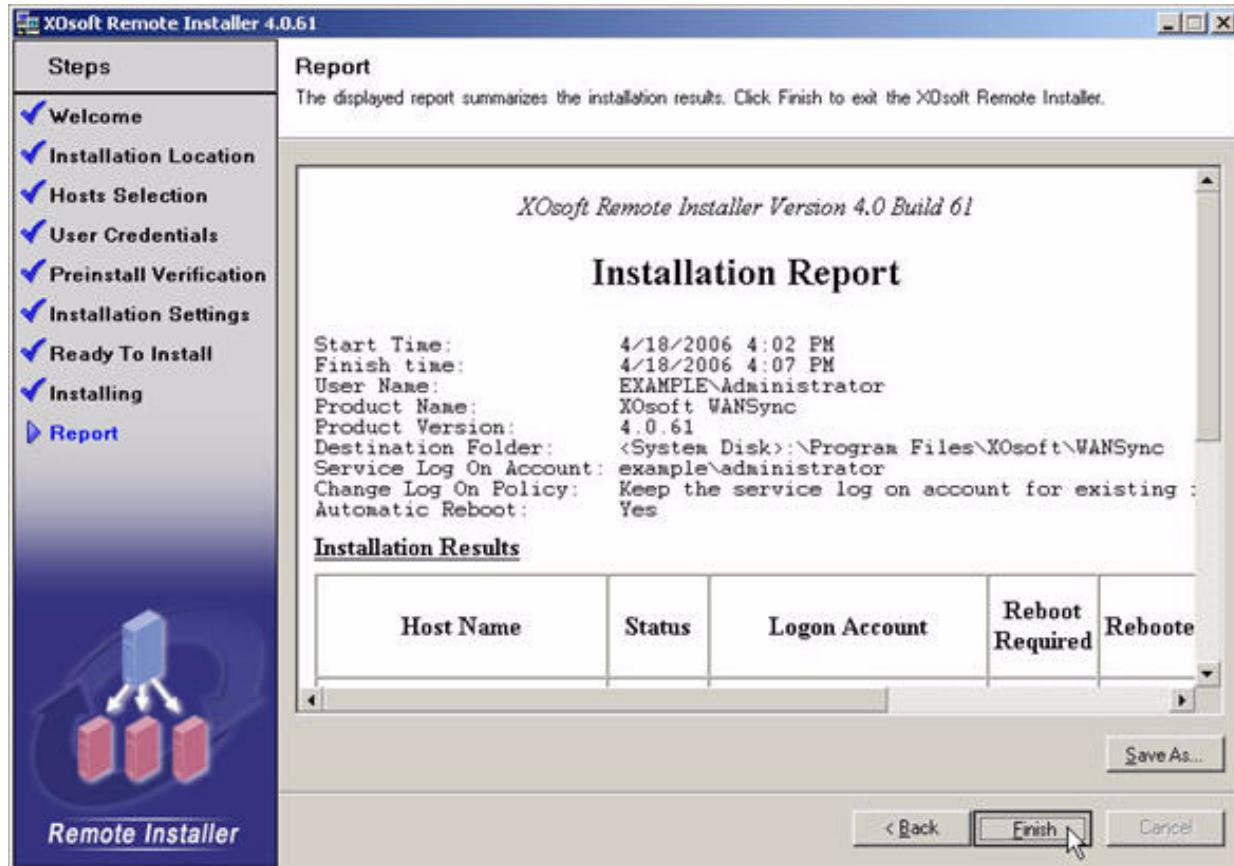


Note: Do not proceed without first setting the correct service account (see *Requirements* for more details).

- **Ready to Install** - confirm that all desired servers are listed and then click the Install button
- **Installing** - you can monitor the installation process from this screen



- **Report** - in this last step you can view the full installation report and, optionally, save a copy (the XOsoft Engine now is installed on all selected servers)



Master Server

To install on the master server:

1. If you did not use the Remote Installation Wizard, install WANSyncHA on the master server.

Note: When installing WANSyncHA, use the log on account as described in *Requirements*.

If you installed under a different account than required, you can change it any time using the Windows services console: find the XOsoft Engine service and change the log on account. Then restart the service to apply the change.



2. If you have file level antivirus software installed, exclude the WANSyncHA installation directory and Oracle database from antivirus protection.

Replica Server

To install on the replica server:

1. If you did not use the Remote Installation Wizard, install WANSyncHA on the replica server.

Note: When installing WANSyncHA, use the log on account as described in *Requirements*.

If you installed under a different account than required, you can change it any time using the Windows services console: find the XOsoft Engine service and change the log on account. Then restart the service to apply the change.

2. If you have file level antivirus software installed, exclude the WANSyncHA installation directory and Oracle database from antivirus protection.

Configure a Replication Scenario

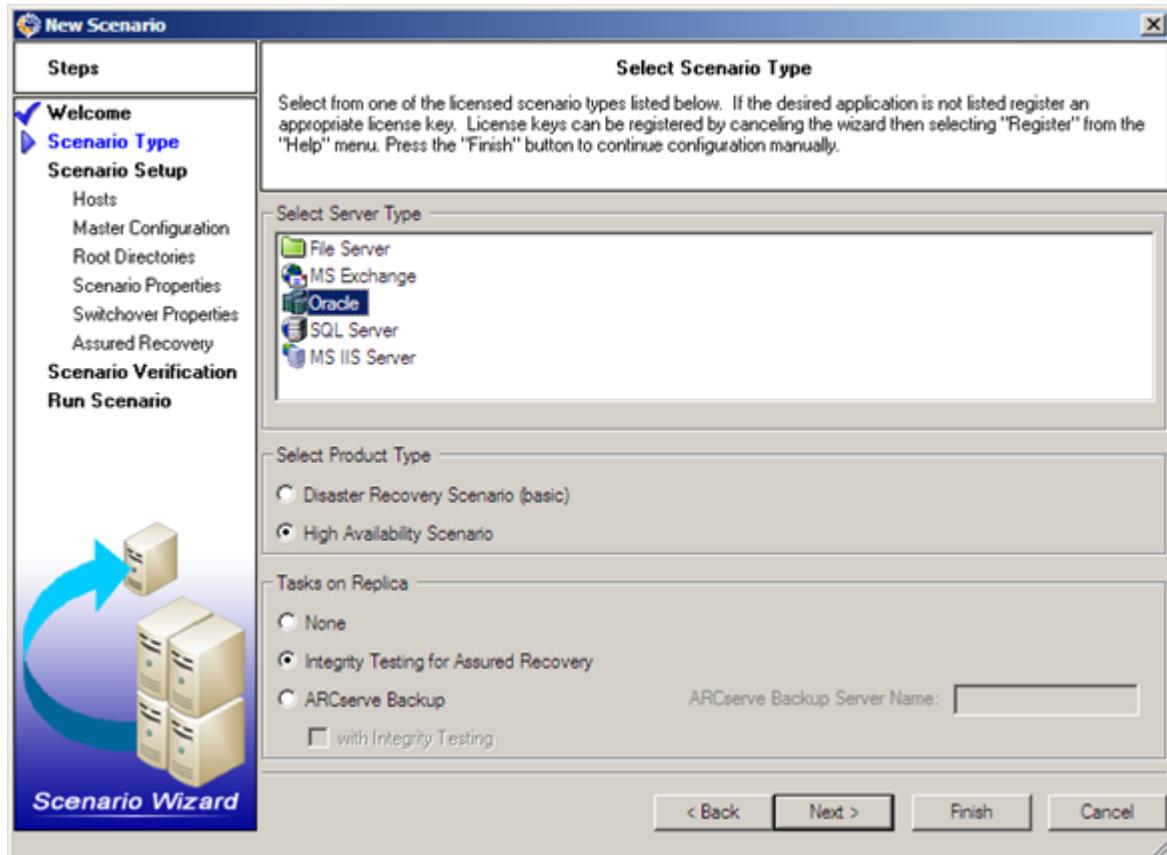
The following subsections describe how to create and configure a replication scenario.

Create a New Scenario

To create a new scenario:

1. Open WANSync Manager. From the File menu select *New* or click the *New Scenario* button.
2. At the Welcome step click *Next* to *Create New Scenario*.
3. At the Scenario Type step select *Oracle* and *High Availability Scenario* and, optionally, *Replica Integrity Test for Assured Recovery*.

Note: Learn more about Assured Recovery and how it can help ensure success through automatic testing. Please visit the Products menu at www.caxosoft.com or review the *WANSync User Guide* for more information.



4. During the Hosts step, name the scenario and input the server names for the master and replica hosts.

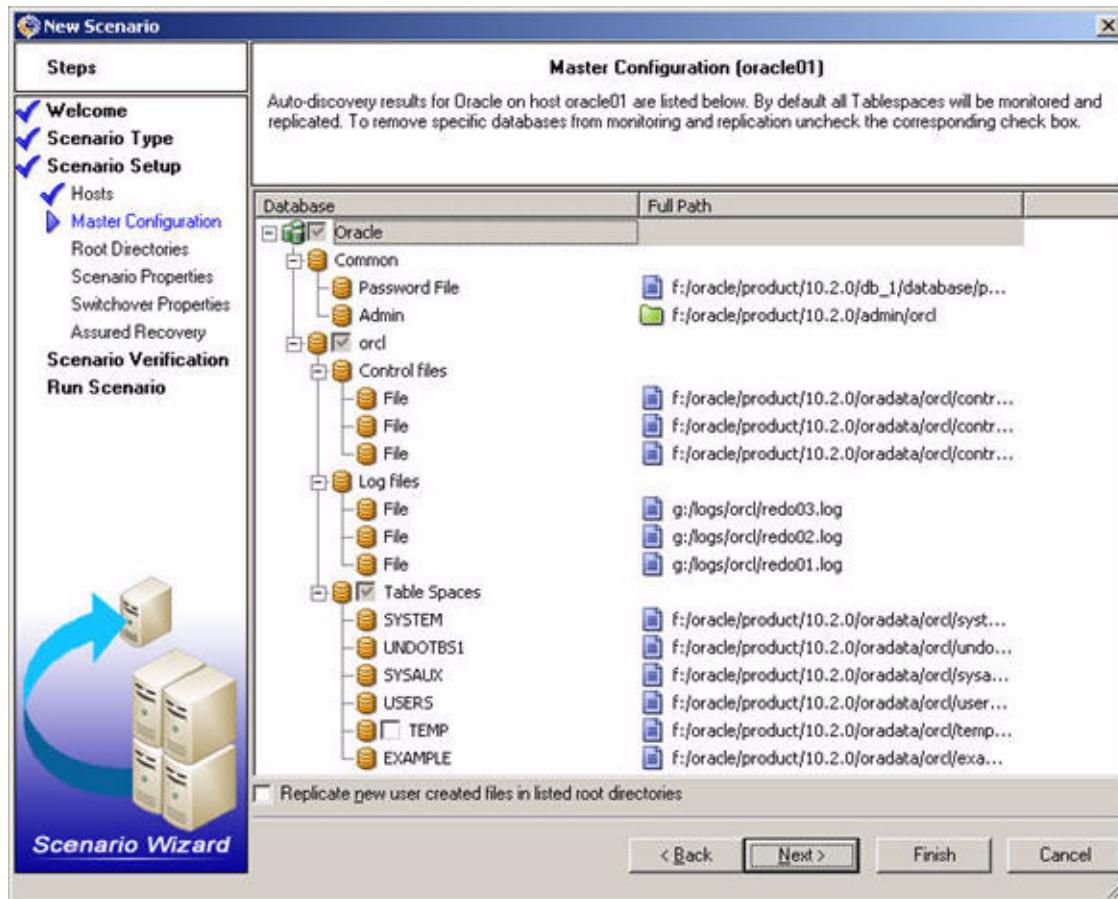


5. After pressing the Next button you are prompted for the database name and credentials. Use an account that has administrative privileges in the database. WANSyncha uses this account to query the Oracle configuration on the master server.

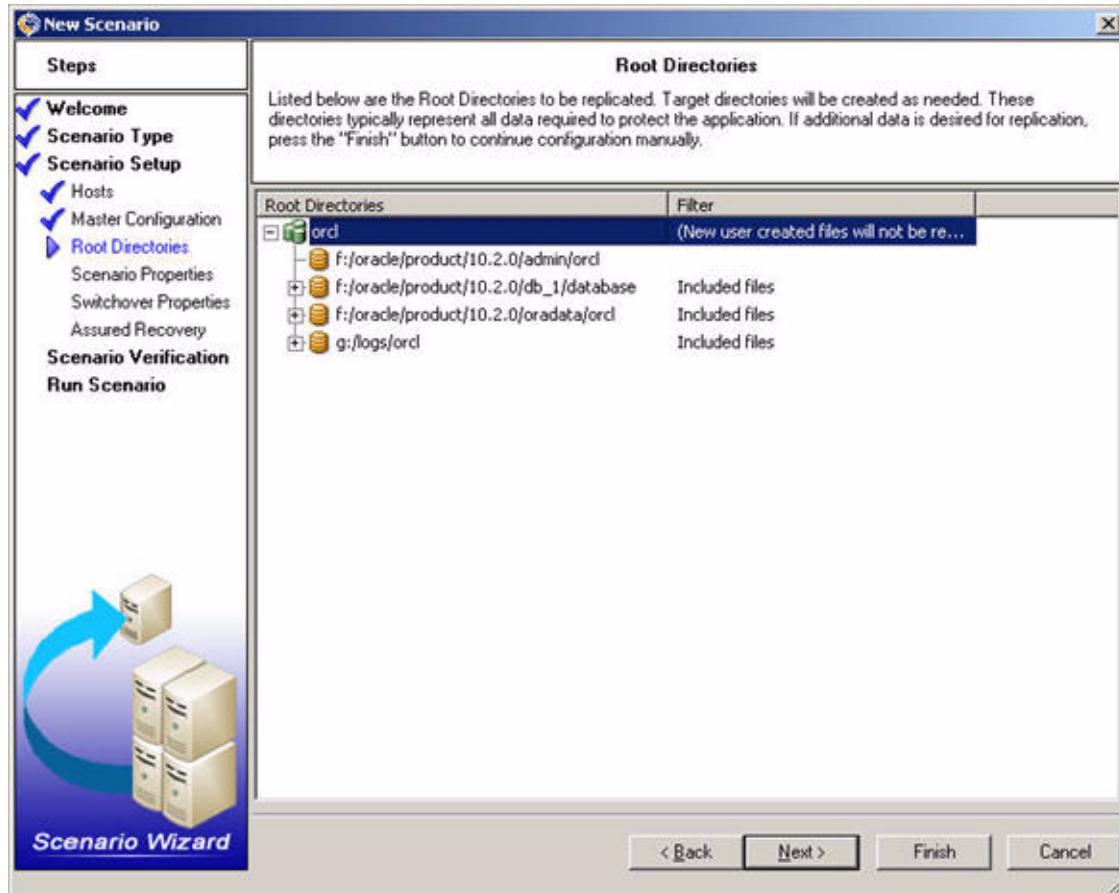


6. At the Master Configuration step, WANSyncha displays the sites on the master server. These are the sites that will be replicated and protected.

Important! It is recommended that you check the *replicate new user created files in listed root directories*. This feature allows you to add new data files automatically to replication without rerunning autodiscovery.



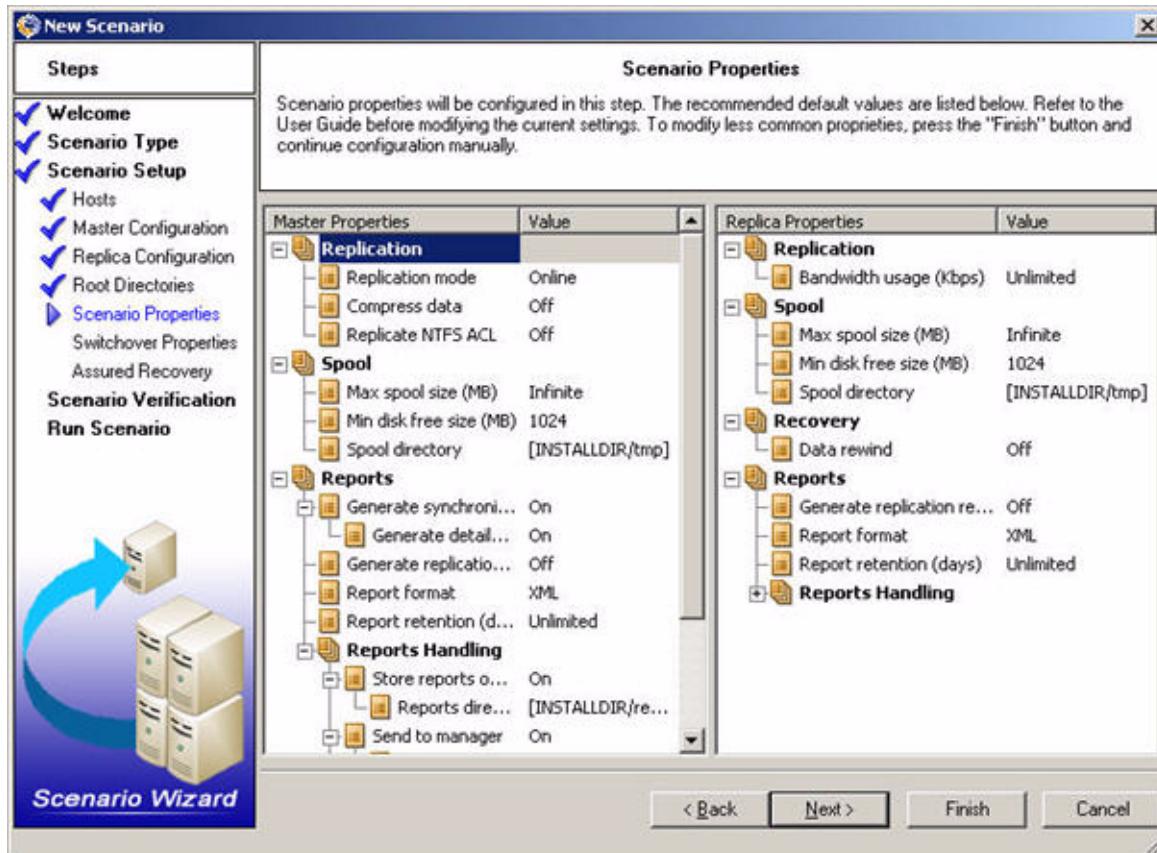
7. The Root Directories step displays the data to be replicated. Click the Next button to continue.



Note: You can add additional files or folders to the replication after running this wizard. Follow the prompt to run the scenario later then double click on *Directories* under the Directories tab.

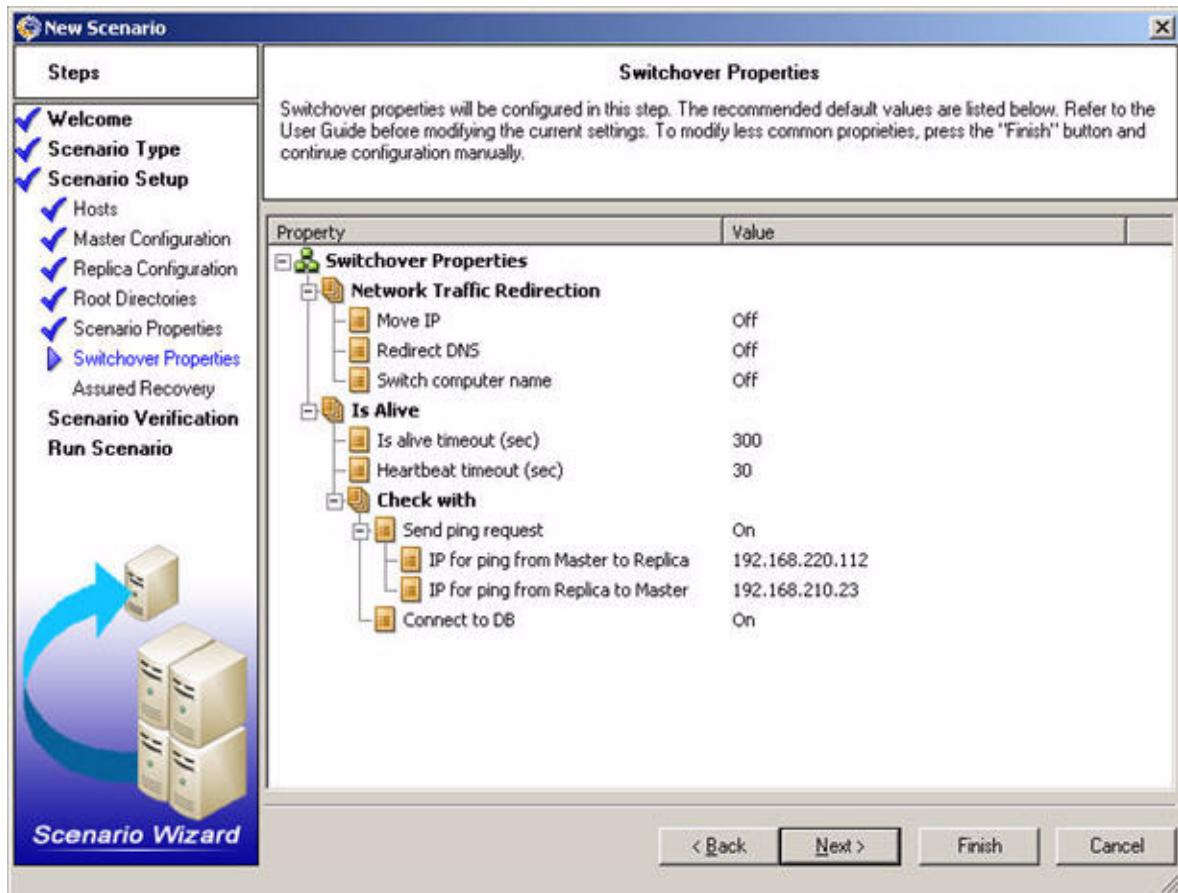
8. The Scenario Properties step allows you to configure additional properties. No changes are required at this step. Otherwise, click Next to proceed.

Note: You can modify all the settings in this pane after the scenario is created. However, before changing any Spool properties (which are configured here), please review *Spool Settings* for configuration details.



9. The Synchronization Properties step allows you to modify synchronization parameters. At this step you must choose a redirection method that suits your needs, or click Finish to specify custom scripts manually as the redirection method. By default, no redirection method is set to on. If you did not review the section *Determining Which Redirection Method to Use*, please do so now and choose the one that is appropriate for your configuration. In most cases, however, Redirect DNS or Move IP work best (see *Move IP Redirection*).

Note: For users planning to use automatic switchover, please note that the *Is alive timeout (sec)* setting controls how long to wait after a failure is detected before triggering switchover.



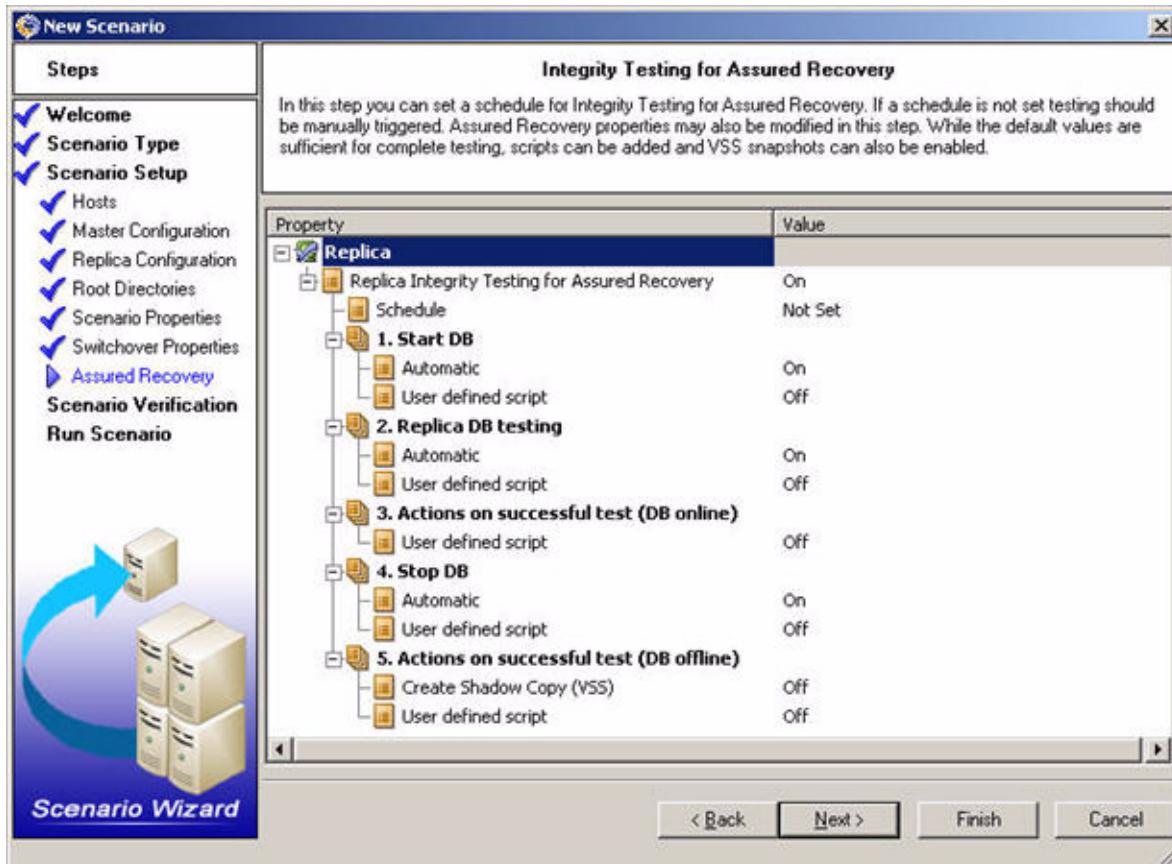
10. The last step in Switchover Properties defines which steps are triggered automatically by WANSyncHA or triggered manually by the Administrator. Select the desired setting for each option and then click the Next button.

Important! It is not recommended to set both of these options to automatic in a production environment. While these options are individually beneficial it is best practice to set only one or the other to automatic (see *Automatic Switchover and Reverse Replication*).



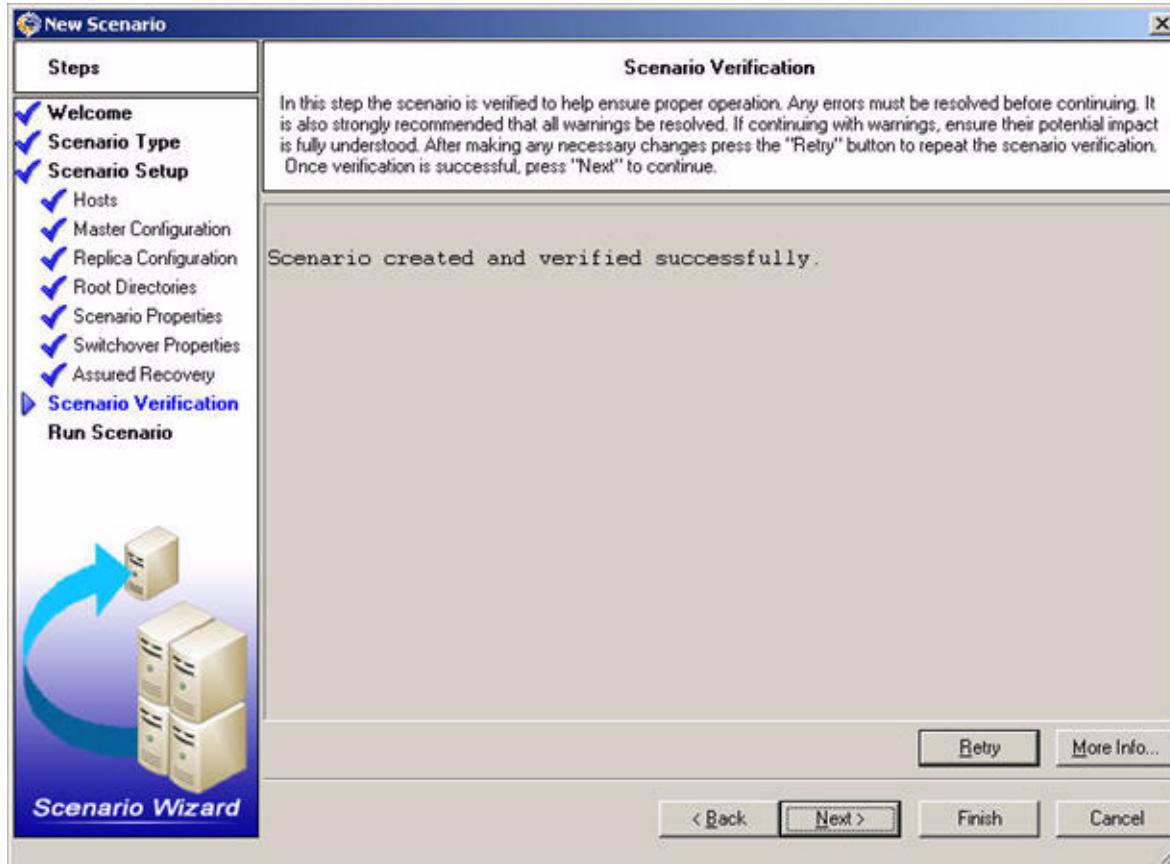
11. The Assured Recovery step is presented only if you selected this option in the Scenario Type step.

Note: If scheduled testing is desired, double-click on the value for *Schedule*: the Assured Recovery hours screen opens allowing you to set a schedule for testing.



12. Scenario Verification checks many different parameters between the master and replica and servers to ensure a successful switchover. If any errors are reported you cannot continue until they are resolved. To retry verification click the Retry button. Once the scenario is verified successfully, click Next to continue.

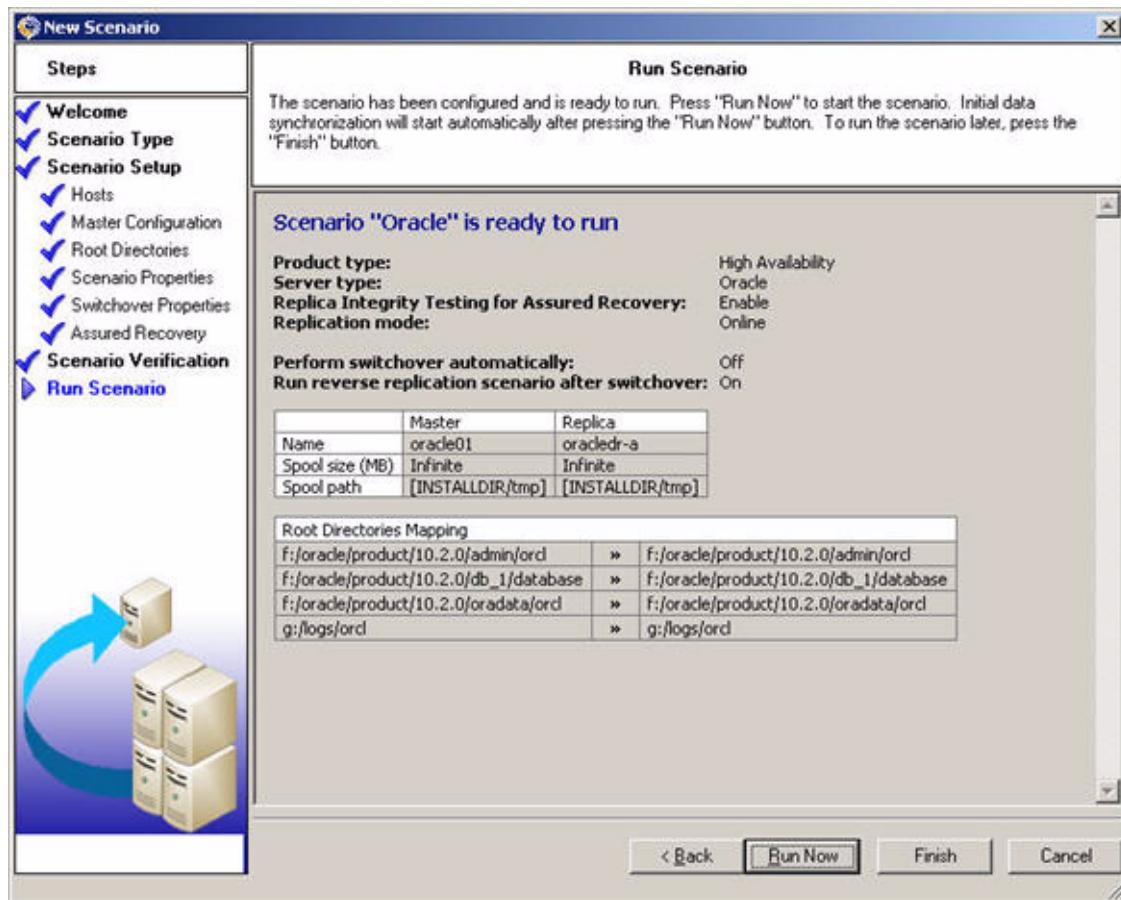
Important! Although the software allows you to continue with warnings, it is not recommended to do so. Resolve any warning situations before continuing to ensure proper operation of the application.



13. The scenario configuration is now complete. Click the *Run Now* button to start data synchronization or click *Finish* to run the scenario later. Synchronization may take a while depending on database size and network bandwidth between the master and replica. You will receive the following

message in the Event window when synchronization is complete: *All modifications during synchronization are replicated.*

At this point, real-time replication is operational and the high availability solution is installed and active.



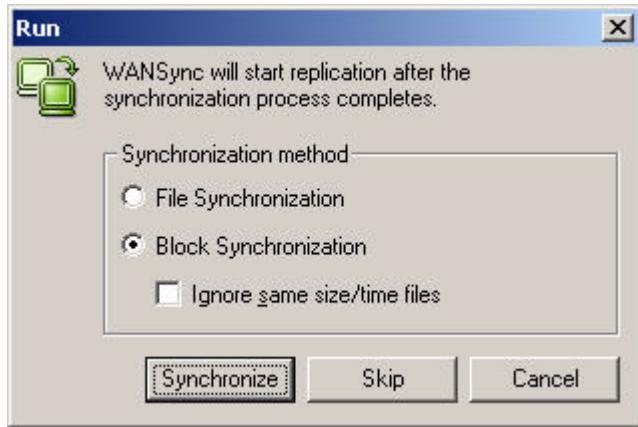
Run the Scenario from Outside the Wizard

To run the scenario outside the wizard:

1. Select the Run button on the WANSync Manager tool bar or select *Run* from the Tools menu.
2. Before initiating synchronization and replication, WANSyncHA verifies your scenario configuration. When verification is complete, WANSync Manager displays the message: *Are you sure you want to run scenario "scenario_name?"* The top pane displays any warning and error messages resulting from verification.

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

3. Click OK to run the scenario. The Run screen is displayed:



4. Leave the default values in the dialog box: the Block Synchronization method with the *Ignore Same Size/time Files* option unchecked.
5. Click the Synchronize button. Synchronization may take a while, depending on database size and network bandwidth between the master and replica. You will receive the following message in the event window when the synchronization is complete: *All modifications during synchronization are replicated.*

At this point, real-time replication is operational and the high availability solution is installed and active.

Chapter 3: Switching Over and Switching Back

This chapter describes the switchover and switchback processes. After completing synchronization, you can initiate switchover and switchback.

Switchover

To initiate switchover:

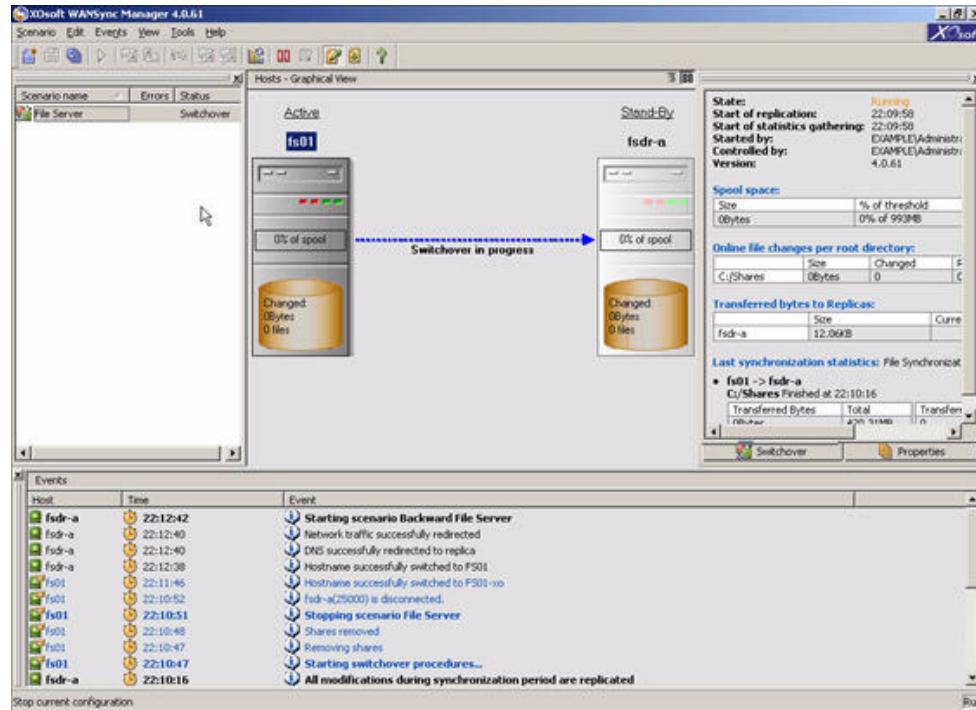
1. Open WANSync Manager and select the desired scenario.
2. Click on the Perform Switchover button or select *Perform Switchover* from the Tools menu.



3. Click OK on the Perform Switchover confirmation window.

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.

Important! After switchover completes the scenario stops. The only case in which the scenario may continue to run after switchover is when automatic reverse replication is turned on. For more information, see *Automatic Switchover and Reverse Replication*.



Switchback

To initiate switchback:

1. Ensure that both master and replica servers are available on the network and the WANSync service (XOsoft Engine) is running.
2. From WANSync Manager, choose the desired scenario.
3. Skip this step if the backward scenario is already running. If the backward scenario is not running, select *Run* to start the scenario: WANSyncHA detects that a switchover has occurred and prompts you that it is running a backward scenario.
4. If resynchronization was required wait for it to complete. You will receive the following message in the Event window: All modifications during synchronization are replicated.
5. Click on the Perform Switchover button or select *Perform Switchover* from the Tools menu and then click *OK* on the Perform Switchover confirmation window.

After switchback is completed, you can again run the scenario in its original (forward) state. In order to avoid resynchronization after a successful switchover, you can opt to use the *Run Reverse Replication Scenario Automatically* option (see *Automatic Switchover and Reverse Replication*).

Appendix A: WANSyncHA Tips

This chapter provides you with helpful information concerning the application.

Spool Settings

The WANSyncHA spool is a folder on disk where data to be replicated is backed up (i.e., spooled) if bandwidth is not sufficient to transfer the amount of changes in real-time. Data can spool due to temporary network disconnections, network congestion, or simply because the network bandwidth is not sufficient to transfer the amount of data changing over on the server.

In addition to storing changes waiting on available bandwidth, spool space is also used as part of the normal synchronization process. Thus, some spool build up during synchronization is normal.

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

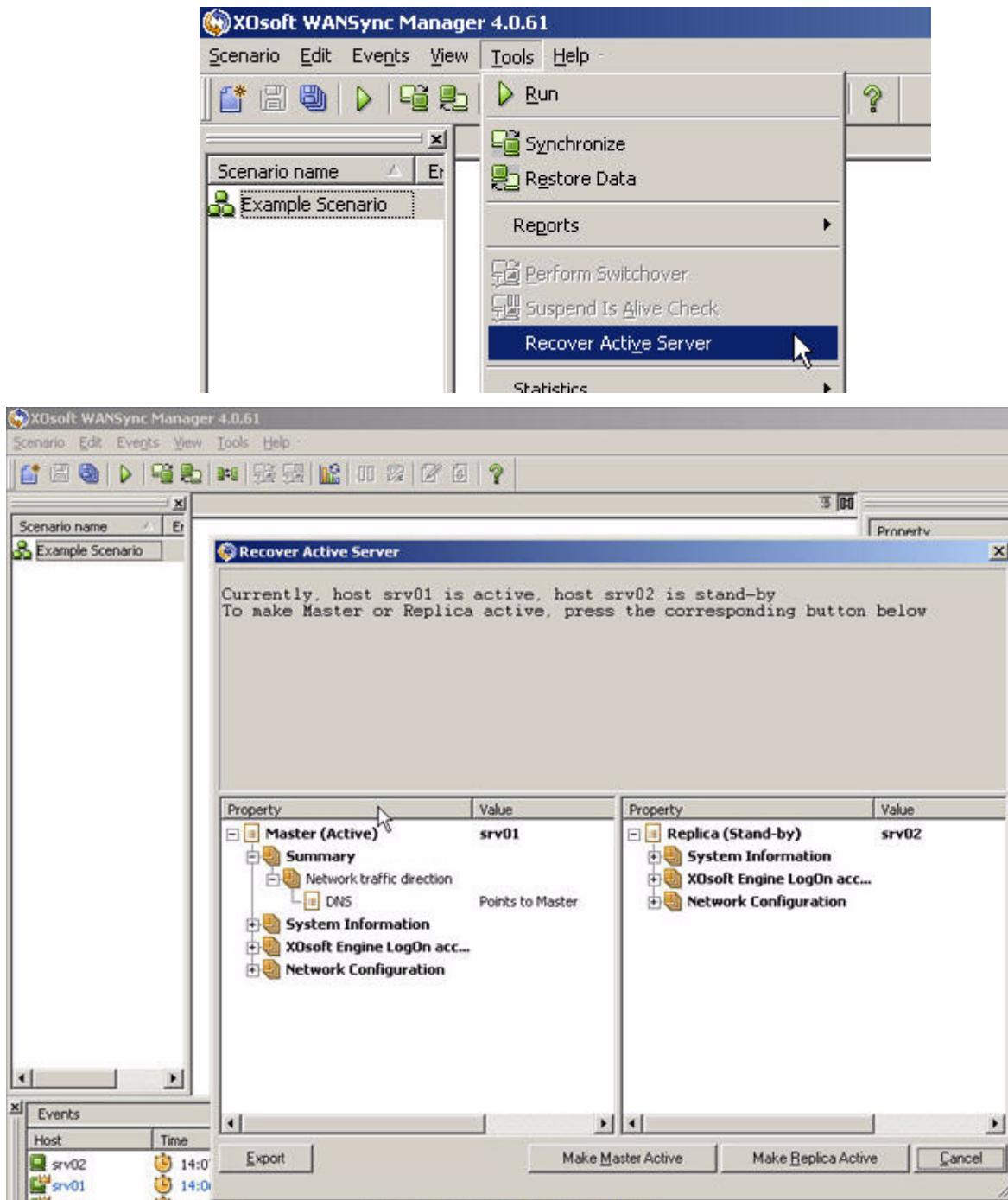
Important! If you change the spool location, please remember to remove the new path from file level antivirus scans: both scheduled and real time.

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. WANSyncHA allows for this option through a process called Recover Active Server. To use this option, ensure that the scenario is stopped, and select *Recover Active Server* from the Tools menu.

Important! While this option is the right choice in many situations, use it with caution. If used improperly data loss can occur. Normally WANSyncHA 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, WANSyncHA 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.

Recover Active Server is not available if you are using the Switch Computer Name redirection method.



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.

Read Only Web GUI

The primary WANSync Manager may only be used by one Administrator at a time. Opening the GUI locks it for the current user making simultaneous use impossible. This is required to prevent conflicts. To allow simultaneous monitoring by any number of administrators WANSyncHA also offers a read only Web GUI.

To access the Web GUI:

1. Open your browser to <http://masterservername:25000>.
2. Enter a user account and password with administrative permissions on the master server.



Important! There is no need to refresh the browser; the GUI refreshes automatically. You can monitor all parameters, statistics, and events from this window.

XOsoft WANSync 4.0.61

Scenarios

Example Scenario

Replication Tree

- [srv01, 25000]
- [srv02, 25000]

Statistics

State: Running
Start of replication: 12:19:12
Start of statistics gathering: 12:19:12
Started by: EXAMPLE\Administrator
Version: 4.0.61

Spool space:

Size	% of threshold
0bytes	0% of 1.03GB

Online file changes per root directory:

	Size	Changed	Removed	Renamed
C:/Tools	0bytes	0	0	0

Transferred bytes to Replicas:

	Size	Current File
srv02	12.88KB	

Last synchronization statistics: File Synchronization

- srv01 -> srv02

Events

Host	Time	Type	Event
srv02	12:19:40	Significant	All modifications during synchronization period are replicated
srv02	12:19:39	Significant	Synchronization finished
srv02	12:19:39	Informational	Directory C:/Tools was synchronized
srv02	12:19:39	Informational	Started synchronization of directory C:/Tools ...
srv01	12:19:33	Significant	Started synchronization: method "File Synchronization" (ignore files with the same size and modification time) ...
srv02	12:19:12	Informational	srv02(25000) is connected
srv01	12:19:09	Significant	Starting scenario Example Scenario

Appendix B: Automatic Switchover and Reverse Replication

This chapter describes the automatic (triggered) switchover and automatic reverse replication processes.

Automatic Switchover

Triggered (automatic) switchover is identical to manual switchover performed by the administrator. Automatic switchover 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 *WANSync User Guide*.

Automatic Reverse Replication

When this 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.

Best Practice

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

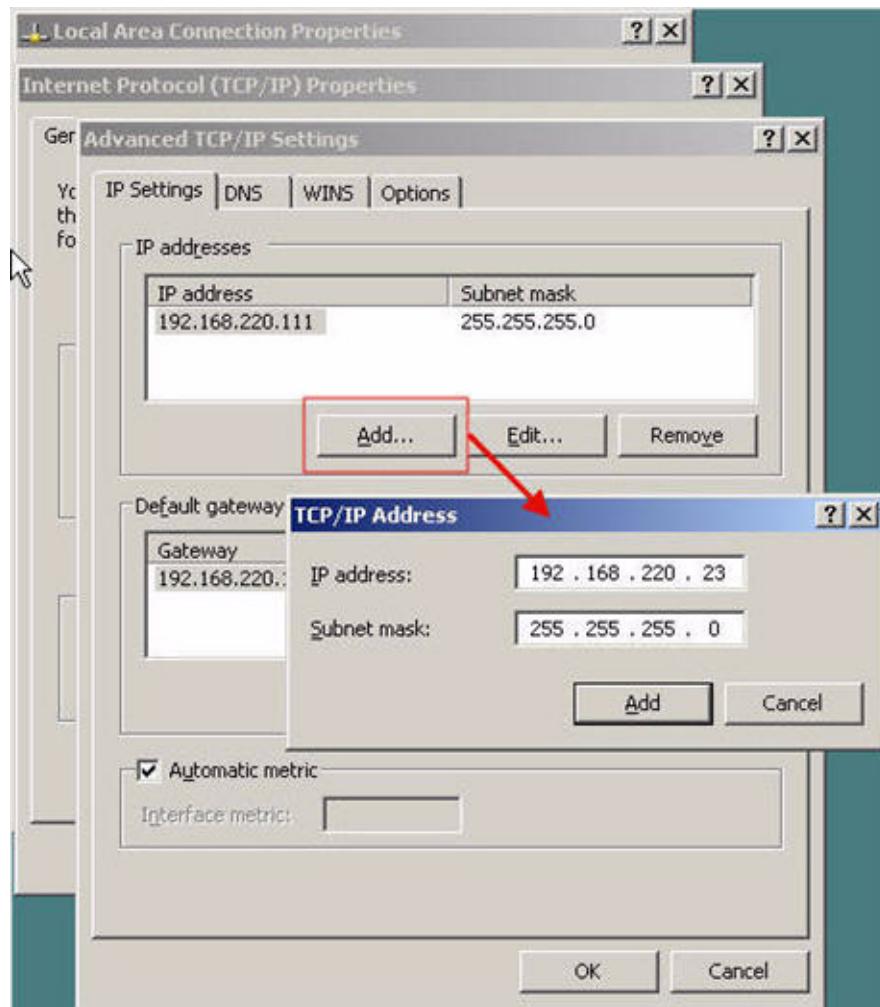
Appendix C: Move IP Redirection

This section describes how to add Move IP redirection to a high availability scenario. Use this method only when both servers are on the same IP subnet.

Move IP on the Master Server

Before configuring the scenario, add an additional IP address to the master host, (which is denoted as *WS-IP* in the following steps). If you have already configured your scenario go ahead and add this IP address; special steps for this situation are listed below. This new IP address is used for WANSync internal communication and replication. This is necessary since the current production IP address is not available on the master after switchover -- it switches to the replica server.

Note that in the following screen shot, the WS-IP IP address is 192.168.220.23 and the current production server IP address is 192.268.220.111.



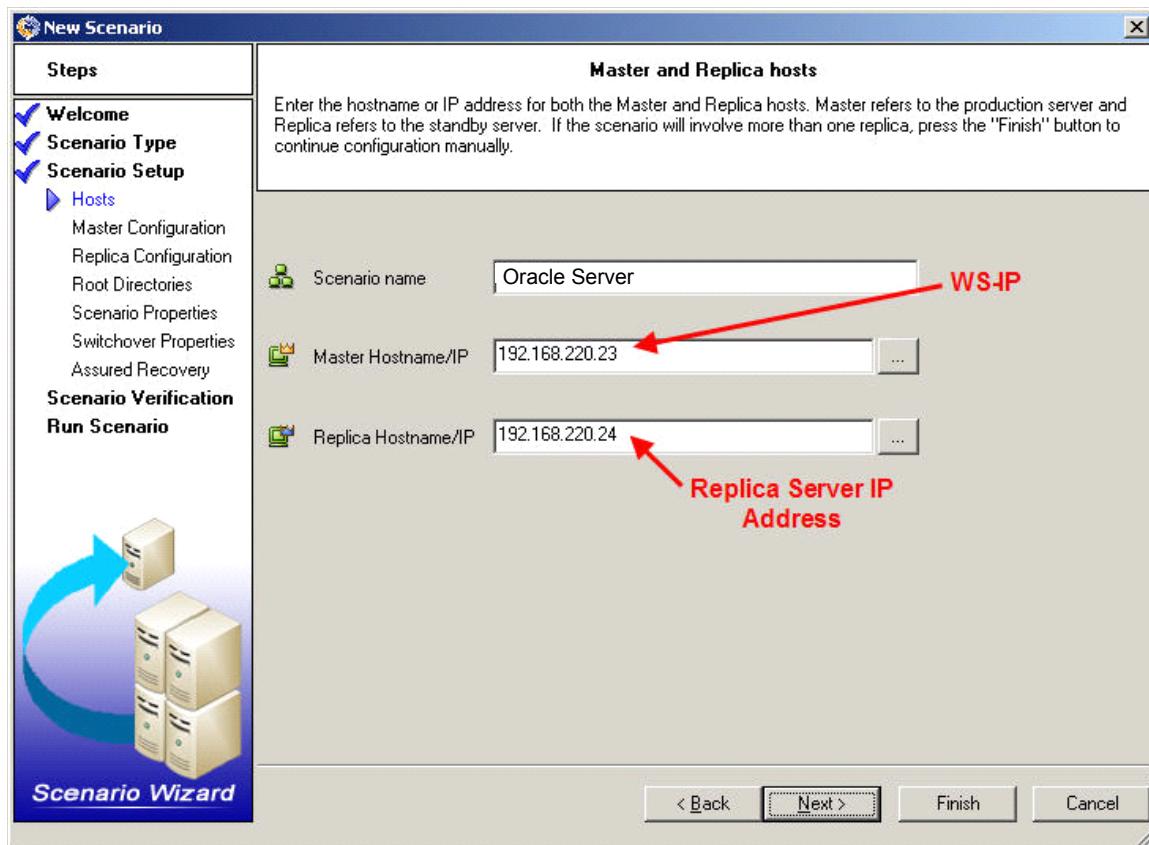
Move IP on the WANSync Manager

This subsection details Move IP redirection on the WANSync Manager.

For New Scenarios

To implement Move IP with new scenarios:

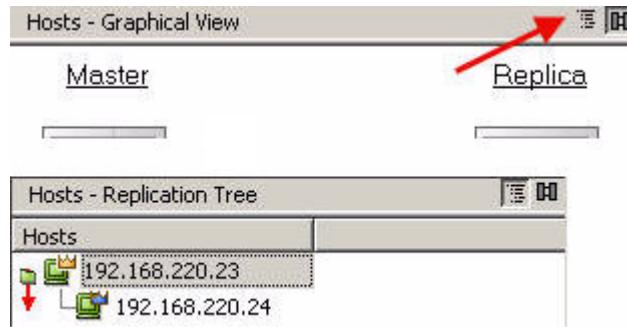
During the initial run of the Wizard, enter the WS-IP and replica IP addresses instead of the server names.



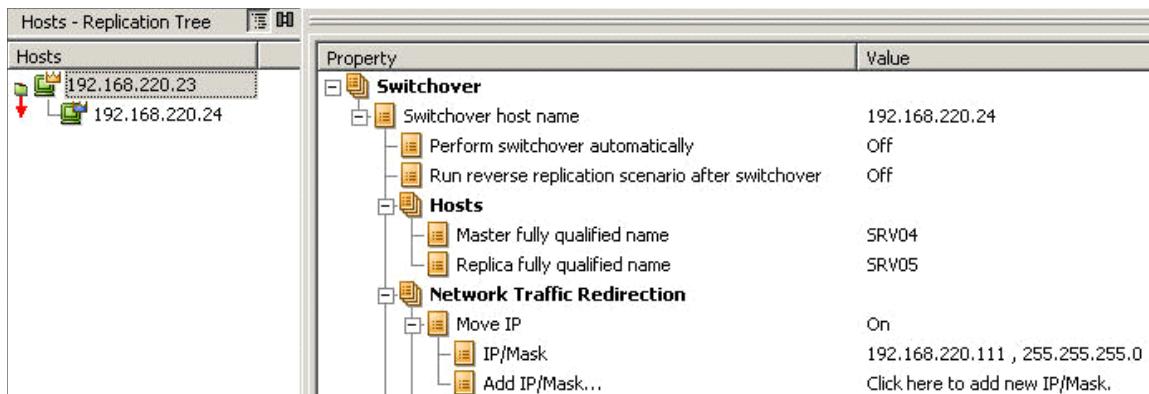
For Existing Scenarios

To implement move IP with existing scenarios:

1. If the Hosts pane is in Graphical View switch to Replication Tree view by clicking the left button in the top right corner of the pane.



2. Right click on the master host name and choose *Rename*. Then enter the WS-IP address.
3. 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*.



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