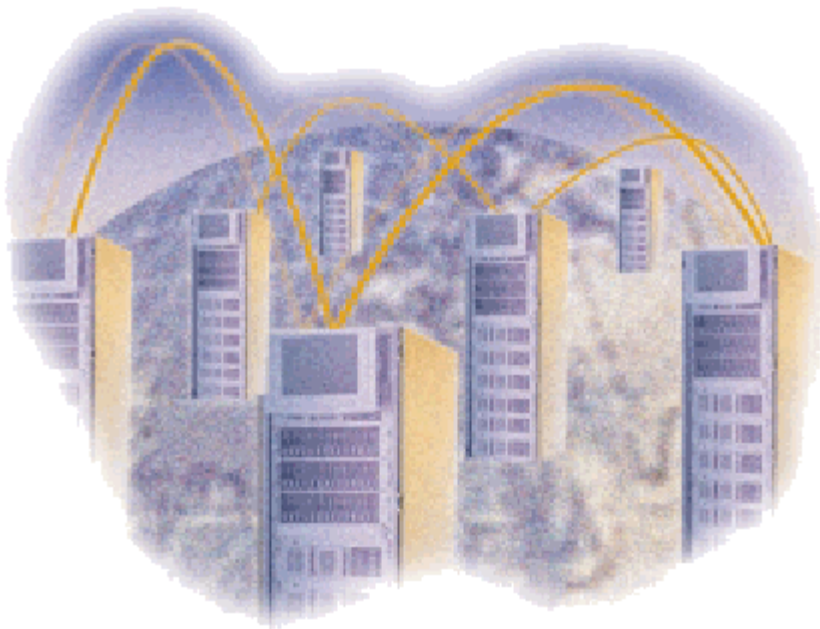




# High Availability for Exchange Server 5.0 and 5.5 Using Double-Take 4.x



High Availability for Exchange Server 5.0 and 5.5 Using Double-Take 4.x published August 2002

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## *Double-Take Support for Application Failover*

Double-Take's file system replication process is application independent and replicates any file system changes (including permissions and attributes) written to NTFS, FAT or FAT32 file systems by any application or process, subject to specific exceptions called out in the *User's Guide* or *readme.txt* file. Maintaining point-in-time consistent file system replicas and providing server monitoring and automatic or manual failover of the server name and IP address are the primary functions of the Double-Take software and we offer support to qualified customers should these functions fail to operate in accordance with our published documentation, regardless of what application or process is manipulating the data.

NSI Software may provide application notes and other documents that provide implementation guidelines on how to use Double-Take functions and replicas to manually or automatically failover or recover many popular third party applications and a general process to accomplish failover or recovery of many other third party applications. While these steps are believed to be accurate for the specific configuration, Double-Take version, and application versions originally tested, due to the number of possible configurations and variables, NSI Software can only test selected combinations and may provide only limited support for the operation and configuration of third party applications or the behavior of those applications before, during, or after failover, in its discretion. In cases where NSI Software has no direct access to or experience with a particular application or configuration, NSI Software support may also be limited to only the actual replication of the file system data and failover (name and IP address) of the server.

For assistance in validating, implementing or troubleshooting these or other possible configurations with third party applications, NSI Software and its partners may offer professional services on a fee basis to apply best practices for assisting with third party applications to recover automatically or manually using replicated data.

This, and any other, application note is provided solely for the convenience of our customers and is not intended to bind NSI Software to any obligation.

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# Introduction

Microsoft Exchange Server is a messaging and collaboration server for the most demanding business needs. Its scalability, performance, and enhanced security make Exchange an ideal messaging foundation for enterprise networks. NSI Software's Double-Take provides real-time enterprise data protection and replication. Double-Take can be used to provide high availability for your Exchange server.

This document describes the steps necessary to configure Double-Take version 4.x to provide high availability for Windows 2000/NT servers running Microsoft Exchange Server versions 5.0 or 5.5. These procedures allow a secondary server to assume the identity and role of a failed Exchange server while maintaining the availability of Exchange services with minimal disruption or data loss.

To complete these instructions, you will install Microsoft Exchange Server and Double-Take, and configure Double-Take for replication and failover. Due to the complexities of these applications, this document is intended for network administrators with experience installing, configuring, and maintaining network applications, including Double-Take and Microsoft Exchange Server.

## Requirements

- ◆ Two servers that meet one of the following operating system requirements:
  - ◆ Microsoft Windows NT 4.0 with Service Pack 4 or higher
  - ◆ Microsoft Windows 2000

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**NOTE:** The two servers should both be running the same operating system. Although cross-platform mirroring and replication are available, NSI Software recommends that the two servers be the same platform for effective failover and failback.

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- ◆ It is recommended that both source and target servers be standalone servers. (You may experience problems with promotion and demotion during failover if either of the machines are Primary or Backup Domain Controllers.)
- ◆ Two licensed copies of Microsoft Exchange Server 5.0 or 5.5
- ◆ Two licensed copies of Double-Take 4.x
- ◆ The Double-Take Chngname utility

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**NOTE:** The Chngname.exe utility is available on the NSI Software web site at [www.nsisoftware.com/updates/chngname.htm](http://www.nsisoftware.com/updates/chngname.htm).

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# Naming Conventions

Double-Take for Windows 2000/NT provides failover capabilities for multiple source (production) servers to be monitored by and failed over to a single target (high availability) server. When a source server fails, Double-Take causes the target server to add (or optionally replace) the failed server's name and IP address. For most applications, this provides nearly instantaneous failover, with no need to reboot the target server, and it allows server-based applications already running on the target server to continue without interruption. When Double-Take performs failover by adding the failed servers name to the existing name of the target, this is known as multi-naming since the target machine is actually broadcasting multiple names on the network and responding for multiple IP address.

Unlike most client-server applications, Exchange is sensitive to the primary name of the server on which it is running. If it was installed on server SOURCE, and server TARGET adds the name SOURCE, Exchange will not run because the server's primary name is still TARGET. However, with the Double-Take Chngname utility, you are provided the ability to temporarily change the primary name on the target to make failover of name sensitive services, such as Exchange, possible.

## Circular Logging in Exchange

Exchange's circular logging feature, which is enabled by default, is designed to prevent the build-up of transaction log files in an attempt to conserve disk space. According to the *TechNet* article, *Best Practices for Exchange Database Management*, you should disable circular logging on each computer running Exchange in order to ensure data protection. If the information store is damaged because of a hardware failure, circular logging prevents you from being able to recover all data changes that were made since your last backup. This is because circular logging maintains only enough log files to ensure the transactional integrity of the database when recovering from a non-hardware failure.

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# Protecting Your Exchange Data

Depending on whether or not Exchange is currently installed and running on your source machine, you will need to select which steps to complete below.

- ◆ If Exchange is not installed, begin with *Install and configure software on the source* below.
- ◆ If Exchange is already installed, begin with *Review source configuration* on page 5.

## Install and configure software on the source

1. Install Microsoft Exchange Server version 5.0 or 5.5 on the source.
2. At the end of the Exchange installation, the Performance Optimizer will automatically start. The Performance Optimizer will analyze your source machine and recommend optimum settings.

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**NOTE:** If the Performance Optimizer does not automatically start at the end of the Exchange installation, select **Start, Programs, Microsoft Exchange, Microsoft Exchange Optimizer**.

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3. Review the introductory information on the first screen and click **Next** to continue.
4. The second screen is used by the Performance Optimizer program to understand your system and recommend optimum settings. It requires you to input how your Microsoft Exchange Server is used in your environment. Mark the **Users on this server, Type of Server, and Users in organization**. This information will be used to determine the recommended settings. Click **Next** to continue.
5. The Performance Optimizer analyzes your hard disks to determine the ideal locations for the Microsoft Exchange Server data. When the disk analysis is complete, click **Next** to continue.

- 
6. Review the recommended settings and, if necessary, update any of the **Suggested Location** fields. After you have finalized your directory selection, record each selection in the table below.

### Performance Optimizer Settings

These directory settings will be used to configure the target so that it is identical to the source machine. You must record the settings exactly.

Exchange Server Data	Drive and Directories
Private Information Store	
Public Information Store	
Information Store Logs	
Directory Service	
Directory Service Logs	
Message Transfer Agent	
Internet Mail Service Files (optional)	

7. Click **Next** to continue.
8. Verify that the **Move files automatically** check box is marked so that the Performance Optimizer can automatically move the files from their current location to the location that you specified. Click **Next** to continue.
9. When you reach the **Congratulations** dialog box, verify the **Do not restart these services** check box is not marked. Click **Finish** to complete the Microsoft Exchange Performance Optimizer.
10. Install the latest Exchange service pack.
11. Install Double-Take version 4.x on the source machine using the installation defaults.

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**NOTE:** If you are using 4.2.0 or earlier, verify that the **transactional applications** option is selected on the Double-Take Optimizations screen since Microsoft Exchange Server is a transactional database application. See the Double-Take guide *Getting Started* for further details. If you are using 4.2.1 or later, this option is set by default.

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12. Continue with *Install and configure software on the target* on page 6.

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## Review source configuration

1. Since Microsoft Exchange is already installed and running, you will need to review and record the directories where your files are stored. View the file `c:\winnt\system32\perfopt.log` and record your Performance Optimizer settings in the table below.

### Performance Optimizer Settings

These directory settings will be used to configure the target so that it is identical to the source machine.  
You must record the settings exactly.

Exchange Server Data	Drive and Directories
Private Information Store	
Public Information Store	
Information Store Logs	
Directory Service	
Directory Service Logs	
Message Transfer Agent	
Internet Mail Service Files (optional)	

---

**NOTE:** The Performance Optimizer log is a cumulative file. If you ran the Performance Optimizer more than once, you will have to determine the final location of all files.

---

```
Microsoft Exchange Server Performance Optimizer log file opened.: 1/17/01 - 8:53:19 AM
-----
Detected 2 processor(s)
Detected 133607424 bytes physical memory
Found fixed logical disk C:
Found fixed logical disk D:
The database file C:\exchsrvr\MDBDATA\PRIV.EDB is consistent.
The database file C:\exchsrvr\MDBDATA\PUB.EDB is consistent.
The database file C:\exchsrvr\DSADATA\dir.edb is consistent.
Performance Results
(Smaller values better)
Disk RA(ms)   Seq(ms)
-----
C:   40773    52407
D:   21492    52781
Microsoft Exchange Server Information store log file was moved from C:\exchsrvr\MDBDATA to D:\exchsrvr\MDBDATA
Microsoft Exchange Server Private information store file was moved from C:\exchsrvr\MDBDATA to D:\exchsrvr\MDBDATA
Microsoft Exchange Server Message Transfer Agent log file was moved from C:\exchsrvr\MTADATA to D:\exchsrvr\MTADATA
Microsoft Exchange Server Public information store file was moved from C:\exchsrvr\MDBDATA to D:\exchsrvr\MDBDATA
Microsoft Exchange Server Directory service database file was moved from C:\exchsrvr\DSADATA to D:\exchsrvr\DSADATA
Microsoft Exchange Server Directory service log file was moved from C:\exchsrvr\DSADATA to D:\exchsrvr\DSADATA
```

- 
2. If you have not yet done so, install Double-Take version 4.x on the source machine using the installation defaults. See the Double-Take guide *Getting Started* for details.

---

**NOTE:** If you are using 4.2.0 or earlier, verify that the **transactional applications** option is selected on the Double-Take Optimizations screen since Microsoft Exchange Server is a transactional database application. See the Double-Take guide *Getting Started* for further details. If you are using 4.2.1 or later, this option is set by default.

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3. Continue with *Install and configure software on the target* below.

## Install and configure software on the target

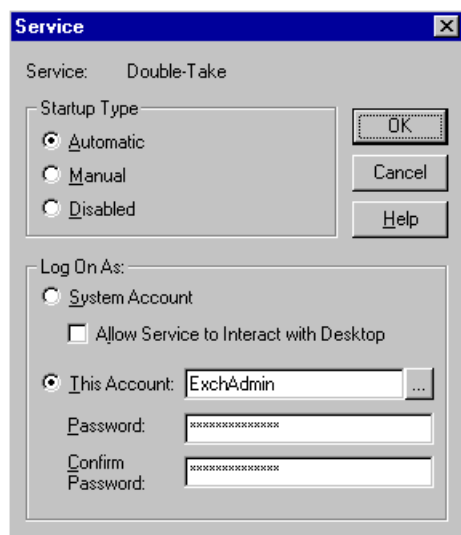
1. Install Double-Take version 4.x on the target machine using the installation defaults. See the Double-Take guide *Getting Started* for details.

---

**NOTE:** If you are using 4.2.0 or earlier, verify that the **transactional applications** option is selected on the Double-Take Optimizations screen since Microsoft Exchange Server is a transactional database application. See the Double-Take guide *Getting Started* for further details. If you are using 4.2.1 or later, this option is set by default.

---

2. In Control Panel, Services, double-click the Double-Take service.
3. Under **Log On As**, select **This Account**, enter the Exchange Administrator account, and click **OK**.



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**NOTE:** Verify that the account you enter is also a member of the local Double-Take Administrators group.

You will need to stop and restart the Double-Take service for this change to take effect.

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**NOTE:**

The following sample batch files are available on the NSI Software web site at [www.nsisoftware.com/download/exchscrp.exe](http://www.nsisoftware.com/download/exchscrp.exe).

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4. If a failure occurs, you will want to have the Exchange services start on the target machine automatically. To do this, create a batch file called `postover.bat` using the sample batch file below. Save the batch file to the same directory where your Double-Take files are installed. Note that the script below is identical for Exchange 5.0 and 5.5, except for one additional Net Start command which is noted.

#### POSTOVER.BAT

```
rem This command temporarily changes the name of the server. You will need to
rem replace <drive>:\<directory>\ with the location of your Double-Take script
rem files and replace source_name with the name of the source machine. The
rem Chngname utility should be located in the same directory as the
rem Double-Take script files.
<drive>\<directory>\chngname /s source_name

rem These commands start the initial services to run the patch and check the
rem MTA database
Net Start "Microsoft Exchange System Attendant"
Net Start "Microsoft Exchange Directory"

rem These commands patch the database and check the MTA database
cd \
cd exchsrvr
cd bin
mtacheck /v
isinteg -patch

rem This command stops the services
Net Stop "Microsoft Exchange System Attendant" /y

rem These commands start the services
Net Start "Microsoft Exchange System Attendant"
Net Start "Microsoft Exchange Directory"
Net Start "Microsoft Exchange Message Transfer Agent"
Net Start "Microsoft Exchange Information Store"
Net Start "Microsoft Exchange Event Service"

rem The next command is for Exchange Version 5.0 only
rem Remove the remark on the next line if you want this line to execute
remNet Start "Microsoft Exchange Directory Synchronization"

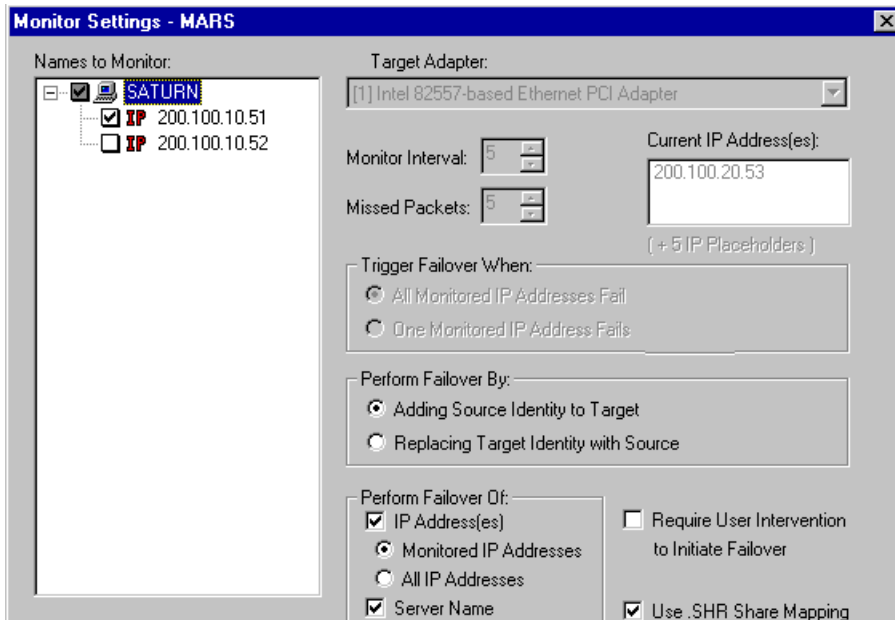
rem This command changes the target name back to its original name. You will
rem need to replace <drive>:\<directory>\ with the location of your
rem Double-Take script files
<drive>\<directory>\chngname /t
```

- 
- After a failure is resolved, you will be ready to bring your source back online. At this time, you will want to stop the Exchange services on the target automatically. To do this, create a batch file called `preback.bat` using the sample batch file below. Save the batch file to the same directory where your Double-Take files are installed.

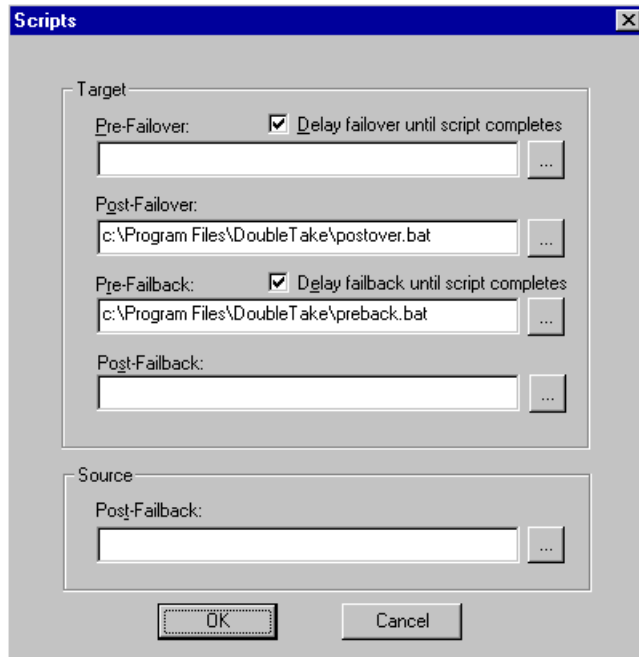
#### PREBACK.BAT

```
rem These commands stop the Exchange services
rem The next command is required only if you are using Internet Mail Service
rem Remove the remark on the next line if you want this line to execute
rem Net Stop "Microsoft Exchange Information Store" /y
Net Stop "Microsoft Exchange Directory" /y
Net Stop "Microsoft Exchange System Attendant"
```

- Select **Start, Programs, Double-Take, Failover Control Center**.
- Select the target machine from the list of available machines. If the target you need is not displayed, click **Add Target**, enter the machine name, and click **OK**.
- To add a monitor for the selected target, click **Add Monitor**. Type the name of the source machine and click **OK**. The Monitor Settings window will open.
- In the Monitor Settings window, mark the IP address that is going to failover and verify that **Adding Source Identity to Target** is selected.



- 
10. Click **Scripts** and specify the location and file names of the scripts that were created in steps 4 and 5.



11. Click **OK** to go back to the Monitor Settings dialog box.
12. Click **OK** to begin monitoring the source machine.
13. In order to install Exchange on the target successfully, the target must have the source's identity. Unplug the source machine from the network, thus forcing a failover to the target.
14. Watch on the main screen of the Failover Control Center until the countdown completes and failover occurs. After failover has occurred, the target's active server name is identical to the source's name.
15. Install Microsoft Exchange version 5.0 or 5.5 on the target using the same installation settings that were used when Exchange was installed on the source machine. Since Exchange is being installed on the target server as a new site with the same name as the existing site, no Exchange servers for that site can be active on the network at the time of installation.
16. The Microsoft Exchange Optimizer will automatically start after the Microsoft Exchange installation. If it does not, select **Start, Programs, Microsoft Exchange, Microsoft Exchange Optimizer**.
17. Review the introductory information on the first screen and click **Next** to continue.

18. The second screen is used by the Performance Optimizer program to understand your system and recommend optimum settings. It requires you to input how your Microsoft Exchange Server is used in your environment. Since you will be configuring your target to match your source, the Performance Optimizer recommendations are not needed; the default settings are adequate. Click **Next** to continue.
19. The Performance Optimizer analyzes your hard disks to determine the ideal locations for the Microsoft Exchange Server data. When the disk analysis is complete, click **Next** to continue.
20. Using the settings you recorded in the **Performance Optimizer Settings** table in the previous section, complete the **Suggested Location** fields making sure that each setting is identical to the source machine.

**Microsoft Exchange Performance Optimizer**

Based on your computer's hardware configuration, the best locations for Microsoft Exchange Server files are suggested below. If you don't want to use a particular location, you can change it by typing a different path.

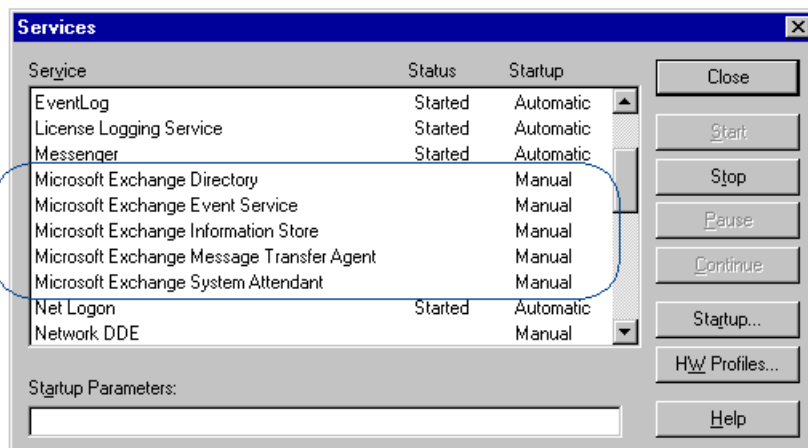
Microsoft Exchange Server	Current Location	Suggested Location
Private Information Store	C:\	C:\exchsrvr\MDBDATA
Public Information Store	C:\	C:\exchsrvr\MDBDATA
Information Store Logs	C:\	D:\exchsrvr\MDBDATA
Directory Service	C:\	C:\exchsrvr\DSADATA
Directory Service Logs	C:\	D:\exchsrvr\DSADATA
Message Transfer Agent	C:\	C:\exchsrvr\mtadata
Internet Mail Service Files	C:\	C:\EXCHSRVR\imodata

< Back   **Next >**   Cancel   Help

**NOTE:** You may or may not have the Internet Mail Service Files entry, depending on your network configuration.

21. Click **Next** to continue.

- 
22. Verify that the **Move files automatically** check box is marked so that the Performance Optimizer can automatically move the files from their current location to the location that you specified. Click **Next** to continue.
  23. When you reach the **Congratulations** dialog box, mark the **Do not restart these services** check box.
  24. Click **Finish** to complete the Microsoft Exchange Performance Optimizer.
  25. Install the latest Exchange service pack and/or any Exchange add-ons (Internet Mail Service, Outlook Web Access, etc.) that you may be using in your environment.
  26. In Control Panel, Services, set the Exchange Services to manual startup. This step also allows the Double-Take failover and failback scripts that you will be creating later to control the stopping and starting of the Exchange services.

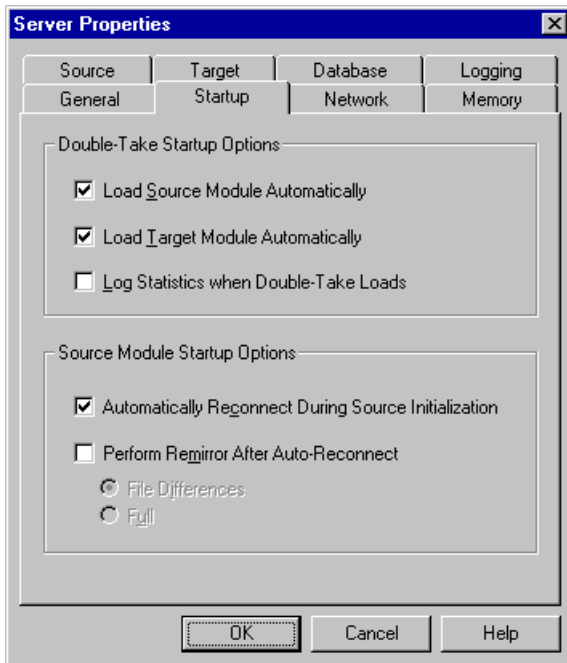


27. Back in the Failover Control Center, highlight the failed over source machine and click **Failback**.
28. When you are prompted whether or not to continue monitoring, reconnect your source machine back to the network. After the source is connected to the network, click **Continue**. This reinitiates failure monitoring and if the source fails, the target will stand in. If you click **Stop**, failure monitoring will be disabled and the target will not stand in for the source in the event of a failure.

---

# Configure Double-Take for mirroring and replication

1. Select **Start, Programs, Double-Take, Management Console**.
2. Double-click your source machine to log on.
3. If you are using Double-Take version 4.1 or earlier, you will need to disable auto-remirror on auto-reconnect so that the source does not remirror files after failback. In version 4.2 and later, the source automatically recognizes that a restore is required and will not remirror. If you are using 4.1 or earlier, complete steps a-c below. If you are using 4.2, you can continue with step 4.
  - a. Right-click the source machine and select **Properties**.
  - b. Select the Startup tab.



- c. By default, **Perform Remirror After Auto-Reconnect** will be selected. Disable this option so that the source does not remirror files after failback. Click **OK** to continue.

---

**NOTE:** If you disable this option and a auto-disconnect occurs, you will need to remirror manually after the connection is reestablished.

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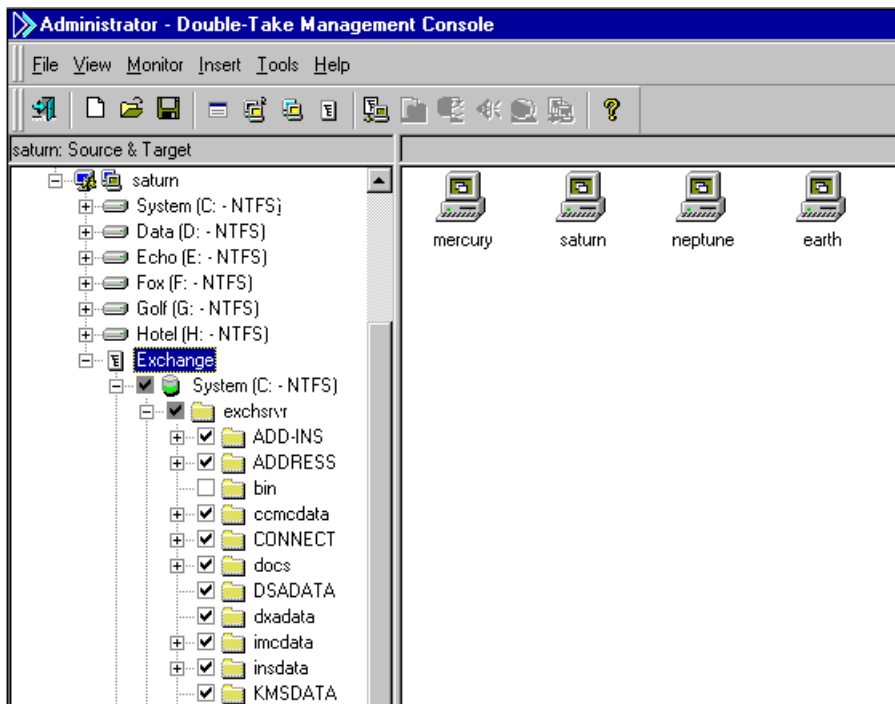
- 
4. Right-click your source machine and select **New, Replication Set** and enter the desired name for the replication set.
  5. Mark the `exchsrvr` directory to select it and all of its subdirectories.
  6. Locate the `exchsrvr\bin` directory and deselect it. You do not want to mirror or replicate the files in the `exchsrvr\bin` directory.

---

**NOTE:** If you are running the Windows 2000/NT Performance Monitor on your target or if your target is displaying any Performance Monitor counters from another machine, and you have the `exchsrvr\bin` directory included in your replication set, Double-Take mirroring will not complete. Performance Monitor accesses a `.dll` in the `exchsrvr\bin` directory on the target so that the mirroring process cannot be completed.

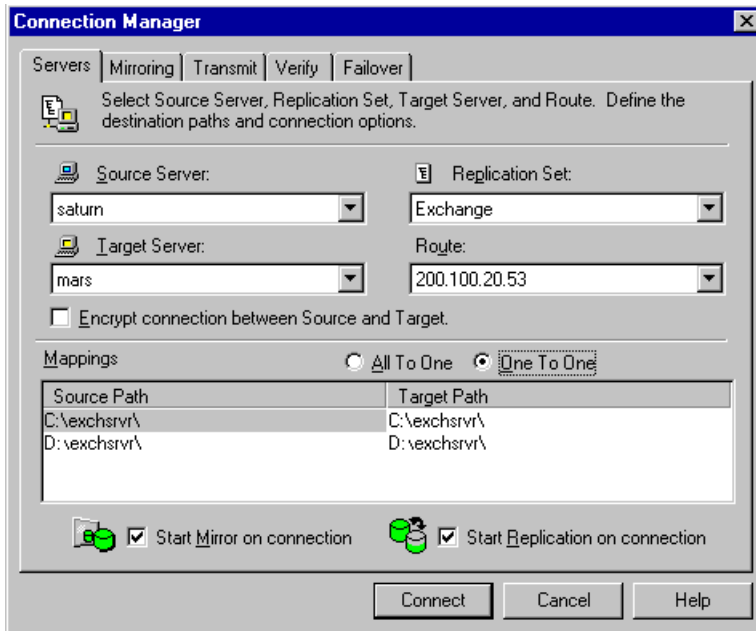
---

7. If the Microsoft Performance Optimizer moved files to different drive locations, be sure to select all of the `exchsrvr` directories, except `exchsrvr\bin`, on all drives.



8. Right-click the replication set name and select **Save** to save the replication set.

- 
9. Drag and drop the replication set onto the target. The Connection Manager dialog box opens.



10. The **Source Server**, **Target Server**, **Replication Set**, and **Route** fields will automatically be populated. If you have multiple IP addresses on your target, verify the **Route** field is set to the correct network path. (For detailed information on establishing a connection, see the *Double-Take User's Guide*.)
11. Select the **One To One** mapping so that the replication set data is transmitted to the same directory structure on the target.
12. Click **Connect** to start the mirror and replication processes.

---

**NOTE:** Exchange continuously writes data to the disk causing the replication statistics in the Double-Take Management Console to constantly change, even when users are not logged in.

Each time you start Exchange, files are modified. If, in a test environment, you failover to your target, you will need to remirror or restore to synchronize the files between the two machines.

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# Restoring Your Exchange Data

If your source experiences a failure, such as a power, network, or disk failure, your target machine will stand in for the source while you resolve the source machine issues. During the source machine downtime, data is updated on the target machine. When your source machine is ready to come back online, the data is no longer current and must be updated with the new data on the target machine.

1. Verify that your source machine is not connected to the network. If it is, disconnect it.
2. Resolve the source machine problem that caused the failure.

---

**NOTE:** If you must rebuild your hard drive, continue with step 3. If you do not need to rebuild your hard drive, continue with step 10 on the next page.

---

3. Install Windows 2000/NT using a temporary name and IP address.
4. Install Double-Take version 4.x using the installation defaults.

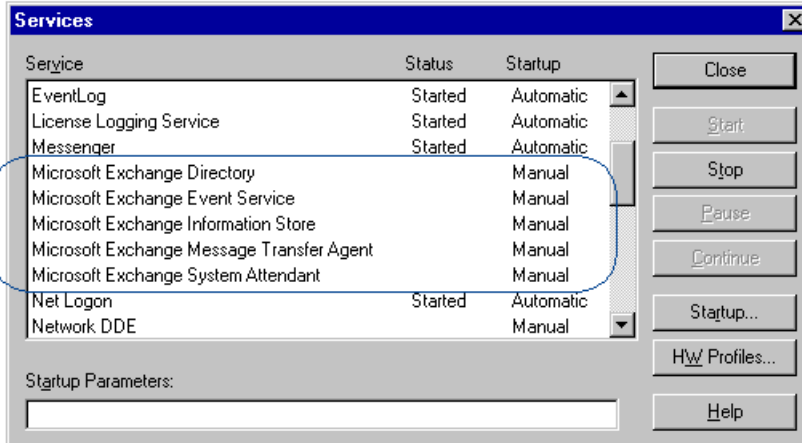
---

**NOTE:** If you are using 4.2.0 or earlier, verify that the **transactional applications** option is selected on the Double-Take Optimizations screen since Microsoft Exchange Server is a transactional database application. See the Double-Take guide *Getting Started* for further details. If you are using 4.2.1 or later, this option is set by default.

---

5. Determine the correct name and IP address for the source server.
6. Shutdown the target server, so that you can provide the source with the correct IP address, name and rejoin the domain.
7. Once the source server is on the network, install Exchange and configure it exactly as before using your settings recorded in the table [Performance Optimizer Settings](#) on page 4 or on page 5.

- 
8. In Control Panel, Services, set the Exchange Services to manual startup.



9. Unplug the source from the network and bring the target back online.

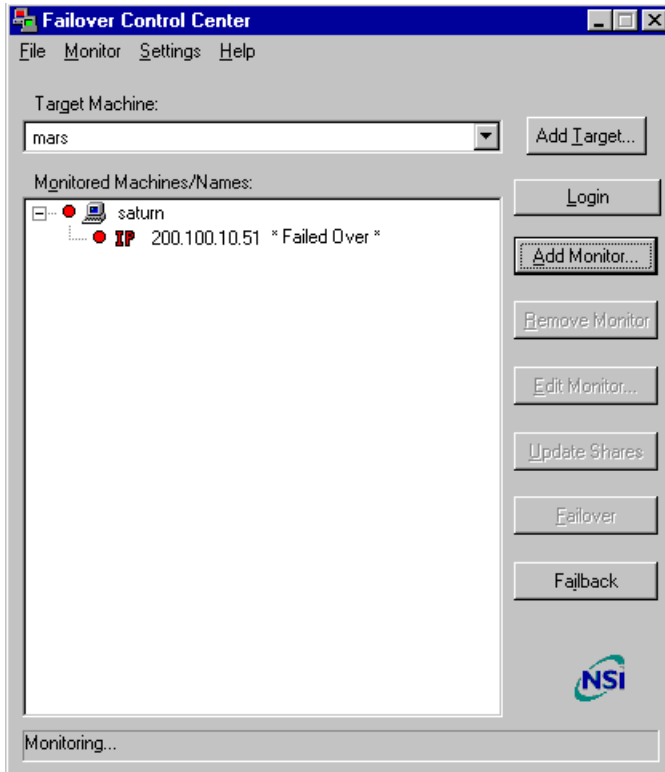
---

**NOTE:** If you rebuilt your hard drive, you do not need to complete the next step because the files will not exist. You can continue with step 11 below.

---

10. On the source machine, locate and delete (or rename) all EDB log files (EDB\* .log) in the \exchsrvr\dsadata and exchsrvr\mdbdata directories to ensure that old log files are not rolled back into the database.
11. **Verify that Exchange is not running on the source.** The Exchange services must not be running at this time. Depending on the type of failure, your services may be set to manual startup but could still be running. Even if you deny users access, incoming internet mail will be delivered to your server if the Exchange services are running. **Stop your Exchange services and set them to manual startup.**
12. If you are using Double-Take 4.1 or earlier; open the Double-Take Management Console (**Start, Programs, Double-Take, Management Console**), highlight the source machine, and ensure that the Exchange replication set is not connected so that replication does not continue after failback is complete. If the replication set is connected, disconnect it by right-clicking it and selecting **Disconnect**.
13. Open the Failover Control Center (**Start, Programs, Double-Take, Failover Control Center**).
14. Select the target machine that is currently standing in for the failed source.

- 
15. Select the failed source and click **Failback**.



The pre-failback script entered during the failover configuration stops the Exchange services on the target so that no additional changes can be made.

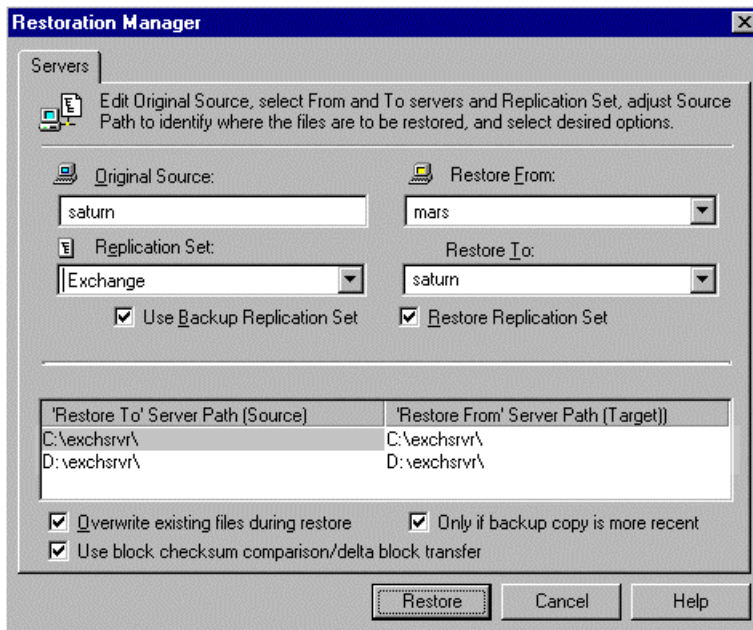
16. You will be prompted to determine if you want to continue monitoring the source server. Do not choose **Continue** or **Stop** at this time.
17. Connect the source machine to the network.
18. After the source is back online, select whether or not you want to continue monitoring this source machine.

- 
19. To begin the restoration process, open the Double-Take Management Console and select **Tools, Restoration Manager**.

---

**NOTE:** You can also run the Double-Take DTCL automated restoration script, which can be found in the Double-Take *User's Guide*, to complete the remaining steps in this section.

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20. Complete the appropriate fields as described:
- ◆ **Original Source**—The name of the source machine where the data original resided.
  - ◆ **Restore From**—The name of the target machine that contains the replicated data.
  - ◆ **Replication Set**—The name of the replication set to be restored.
  - ◆ **Restore To**—The name of the machine where you the data will be restored. This may or may not be the same as the original source machine.
21. Clear **Only if backup copy is more recent**. This option must be disabled because if the Exchange services were stopped on the source after the time they were stopped on the target, the source files will have a more recent date/time and the target file will not be restored.
22. Identify the correct drive mappings for the data and any other restoration options necessary. For detailed information on the restoration options, see the Double-Take *User's Guide*.

- 
23. On the Orphans tab, select to move or delete orphan files on the source. Orphan files, such as out-dated transaction logs, may keep the database from starting on the source.
  24. Verify that the selections you have made are correct and click **Restore**. The restoration procedure time will vary depending on the amount of data that you have to restore.
  25. After the restoration is complete, run the `MTACHECK /v` and `ISINTEG -patch` commands on the source. These commands must be run since the database files were last used on a different server. See your Exchange documentation for further details.
  26. After the Exchange commands have been completed, start the Exchange services on the source machine.
  27. Reestablish the Double-Take Exchange replication set connection.

At this time, your data is restored back to your source machine, the source machine is again the primary Exchange server, and, if you selected to continue failover monitoring, the target is available to stand in for the source in the event of a failure.