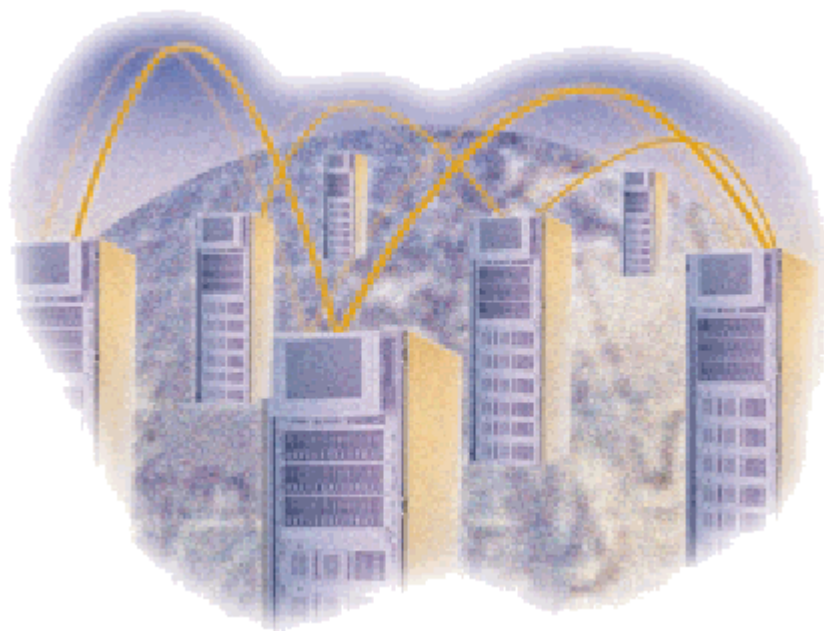




Disaster Recovery for Microsoft Exchange Server 2000



Disaster Recovery for Exchange Server 2000 published April 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.

Table of Contents



1 Introduction	1
2 Requirements	1
3 Pre-failure Configuration	2
3.1 Preparing the source and target servers	2
3.2 Offline Exchange Configuration	4
3.3 Configuring Double-Take	8
4 After a Source Failure	9
5 Reverting Back to the Original Configuration	11
Appendix I—Locating Your Exchange Files	15
Appendix II—Circular Logging in Exchange	16

1 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 also can be used to provide disaster recovery for your Exchange server.

Because of Exchange's server name sensitivity, the limitation of unique names on the network at one time, and Windows 2000 Active Directory, disaster recovery requires a thorough knowledge of Exchange 2000 and Active Directory. To complete these instructions, you will install and configure Microsoft Exchange Server and Double-Take. 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.

This document has been divided into four sections.

- ◆ **Requirements** on page 1 outlines the system requirements required to provide disaster recovery for your Exchange server using Double-Take.
- ◆ **Pre-failure Configuration** on page 2 includes instructions for the required configuration that must be completed to protect your Exchange server.
- ◆ **After a Source Failure** on page 9 includes the minimal steps required by an administrator to get Exchange up and running on a target machine after a failure on the source.
- ◆ **Reverting Back to the Original Configuration** on page 11 allows you to revert back to your original source target configuration, if desired.

2 Requirements

The following requirements must be met in order to use Double-Take to protect your Exchange server.

- ◆ Two licensed copies of Microsoft Windows 2000

NOTE: Both source and target servers should be running the same version of Windows 2000 as well as the same service pack level and identical hot fixes or patches.

Both source and target servers should also have the same logical volume configuration.

- ◆ Both source and target machines should be standalone member servers - not domain controllers.
- ◆ Two licensed copies of Microsoft Exchange Server 2000, Service Pack 1 or later
- ◆ Two licensed copies of Double-Take 4.x
- ◆ You will need access and permission to add, modify, and delete objects in Active Directory for this process.

3 Pre-failure Configuration

The pre-failure configuration is divided into three sections. All of these sections must be completed to protect your Exchange server.

- ◆ **Preparing the source and target servers** on page 2 contains software installations instructions for both the source and target machines.
- ◆ **Offline Exchange Configuration** on page 4 includes the configuration of the target so that it matches the source identically. During these steps, Exchange will be offline and unavailable to the end users.
- ◆ **Configuring Double-Take** on page 8 includes creating your Double-Take replication set and establishing the Double-Take connection.

3.1 Preparing the source and target servers

In this section you will be installing software and preparing the machines.

1. Install Exchange 2000 on your source, if it is not already installed.

NOTE: Keep track of your installation selections and storage locations so that Exchange can be installed identically on the target.

2. Apply any service packs or patches. You must at least apply Exchange Service Pack 1.



3. Install Double-Take on the source, if it is not already installed.



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4. Install Double-Take on the target, if it is not already installed.



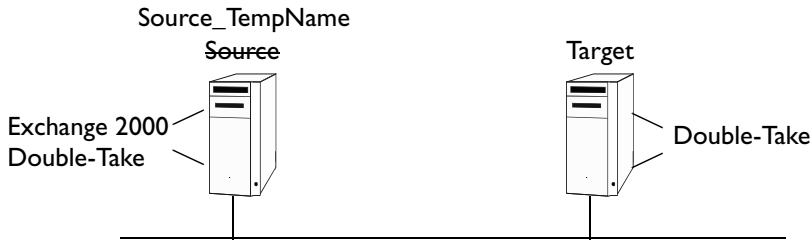
5. Before you installing Exchange on your target, make sure that the NNTP service is loaded on the target. If it is not, the Exchange install will fail.

NOTE: To install NNTP, go to **Start, Settings, Control Panel, Add/Remove Programs** and click **Add/Remove Windows Components**. Select **Internet Information Services (IIS)** and click **Details**. Enable **NNTP** and click **OK** to return to the previous dialog box. Click **Next** to complete the NNTP installation.

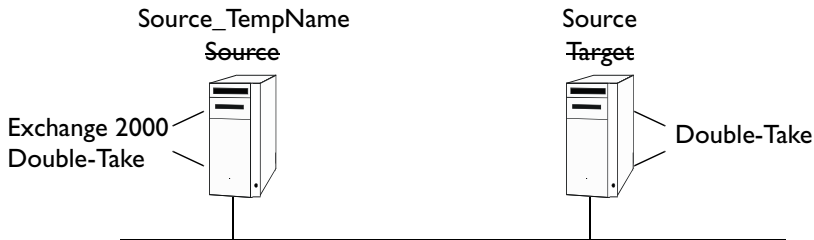
3.2 Offline Exchange Configuration

In this section you will be configuring your target machine so that it is identical to the source. To do this, you must take the source machine, and thus Exchange, offline. Users will be unable to access Exchange until you have completed all of the section 3.2 steps.

1. Rename the source machine to a temporary name and reboot.



2. Rename the target machine to the Exchange server (source machine) name and reboot.



3. Start the Exchange 2000 installation on the target by using the following command:

```
<cd_drive>:\setup\i386\setup.exe /DisasterRecovery
```

NOTE: Verify that you are logged on to the target as a user with full Exchange administrator rights.

4. At the Component Selection dialog box, set the **Action** column to **Disaster Recovery** for all of the components that were installed on the source.

NOTE: If you accepted the default installation on the source, set Microsoft Exchange Messaging and Collaboration Services and Microsoft Exchange System Management Tools to **Disaster Recovery**.

5. Verify that each of the components selected are installed to the same location on the target as they are on the source. If not, modify the location of each component to match the source configuration.

-
- After selecting the proper components and location, click **Next** to continue the install.

NOTE: ♦ You may see several informational messages.

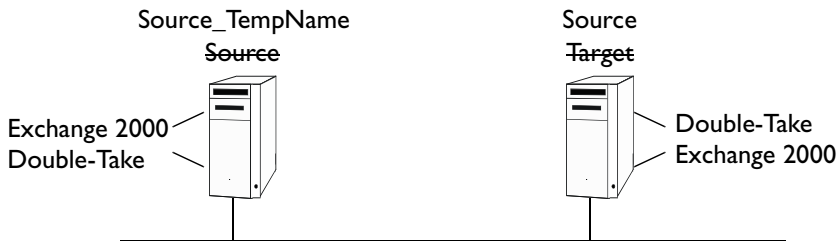
Please use Exchange Admin Snap-in to ensure that you have a valid Exchange Server Object for this server for which you are running setup in recovery mode.

After setup has completed, please restore your databases from backup and then reboot your machine.

These messages do not apply to this configuration and may be disregarded.

- ♦ During the post installation processing, the installation may hang while trying to start the System Attendant (MSEExchangeSA) service. It should take no more than a couple of minutes to start this service. If it takes longer, use the Windows Task Manager to terminate the `setup` process. This will not effect your ability to start services on the target after a failure.
-

- When the install is complete, do not reboot your computer. Install the same Exchange service packs or patches as applied to the source. You do not need to reboot when prompted.



- On the target, set all of the Exchange Services to manual startup. By default, this includes:

- ♦ Microsoft Exchange System Attendant
- ♦ Microsoft Exchange Routing Engine
- ♦ Microsoft Exchange Information Store
- ♦ Microsoft Exchange MTA Stacks
- ♦ Microsoft Exchange IMAP
- ♦ Microsoft Exchange POP3

Set those services that are relevant for your environment to manual startup.

- Verify that the log on account used for the Microsoft Exchange System Attendant service is a domain administrator as well as an Exchange administrator.

10. Because of a known issue with starting the Microsoft Exchange System Attendant service (see Microsoft Knowledge base article Q280432), you need to change the permissions on the Microsoft Windows 2000 server's key container files. To reset the permissions:

- a. Open Microsoft Windows 2000 Explorer.
- b. Locate the %SystemDrive%\Documents and Settings\All Users\Application Data\Microsoft\Crypto\RSA\MachineKeys folder. There are several files located in this folder, each corresponding to a key container.

NOTE: In order to see these hidden files, you must turn on **Show hidden files and folders** in Windows Explorer (**Tools, Folder Options, View**).

- c. Reassign the Administrator account **Full** access to each file.

11. Create a script that starts the Exchange services that are relevant for your environment.

```
rem Sample script to start all of the default Exchange services
rem Modify this script to start the services used in your environment

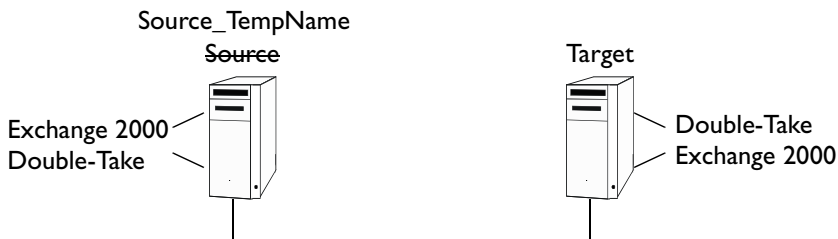
net start MExchangeSA
net start RESvc
net start MExchangeIS
net start MExchangeMTA
net start IMAP4Svc
net start POP3Svc
```

NOTE: The services must be started in the order shown.

12. Run the script to verify that all of the services will start on the target.

NOTE: In some cases the Information Store (IS) may not start on the first attempt. If this happens, simply restart the service and it should start properly. (You will have to restart the other services in the same order as listed in the script.)

13. Rename the target back to its original name and reboot.



NOTE: Make sure that the target has at least shutdown in the reboot process before continuing.

-
14. Rename the source back to its original name and reboot.



NOTE: If the System Attendant service fails to start after the reboot, change the log on account back to the Local System account and restart the service. (You will have to restart the other services in the same order as listed in the script you created earlier.)

15. Mount any data stores that are not mounted. (Open the Exchange System Manager and select **Site, Servers, Source Server, Storage Groups**. Right-click each store that is not mounted (those marked with a red icon) and select **Mount Store**.)
16. Configure the stores to always mount at startup. (Right-click each store and select **Properties**. On the Database tab, disable **Do not mount this store at startup**.)

At this time, your Exchange is running again on your source. User access can resume. Also at this time, your target is configured identically to your source machine. After your Double-Take connection is established the target will be able to stand-in for the source with only a few minor modifications.

NOTE: Changes to your source machine Exchange configuration, such as an Exchange service pack installation, must be reflected in your target configuration. Therefore, you would have to repeat this section so that the target's version would be identical to the source.

3.3 Configuring Double-Take

In this section, you will be creating your Double-Take replication set and establishing the Double-Take connection between your source and target machines.

1. Open the Double-Take Management Console on the source and log on to your source and target machines.
2. Right-click your source machine and select **New, Replication Set** and enter the desired name for the replication set.
3. Select all of your Exchange data, excluding the `\bin` directory.

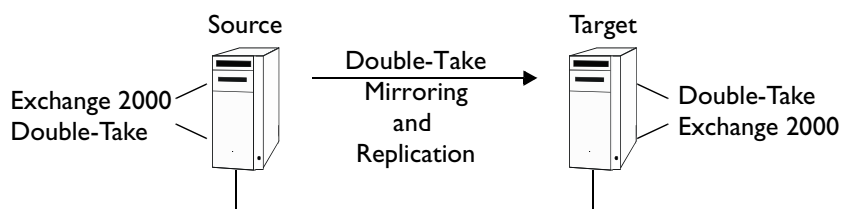
NOTE: Be sure and exclude the `\bin` directory.

Be sure and select all of the Exchange data, even if they are on different drives.

If you need assistance determining all of the locations where your files are stored, see [Appendix I—Locating Your Exchange Files](#) on page 15.

4. Right-click the replication set name and select **Save** to save the replication set.
5. Drag and drop the replication set onto the target. The Connection Manager dialog box opens.
6. 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*.)
7. Select the **One To One** mapping so that the replication set data is transmitted to the same directory structure on the target.
8. 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.



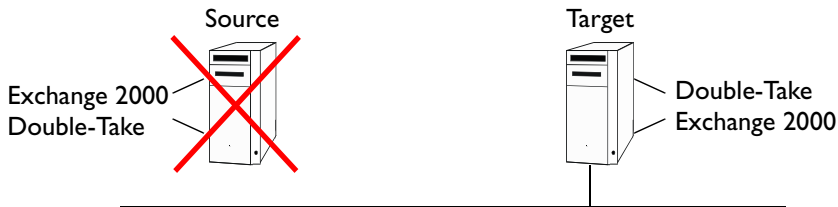
After the mirror has finished, your target contains the necessary backup files to stand-in for the source machine, if it should fail. Double-Take's replication will keep the target up-to-date with the Exchange data on the source. In the event of a source failure, the target machine is prepared and ready for modifications that will bring Exchange back online quickly.

4 After a Source Failure

As long as Double-Take is replicating, if the source machine fails, the target machine contains the latest Exchange data. Because of Exchange's server name sensitivity and Windows Active Directory, minor modifications will be required to get Exchange up and running on the target.

WARNING: If the initial mirror has not completed so that the **Mirror Status** is **Idle**, the target will not be prepared to stand in for the source. If your mirror is not idle, the Exchange data on the target will be incomplete and Exchange will not start.

1. At this point some problem has caused the source to fail.

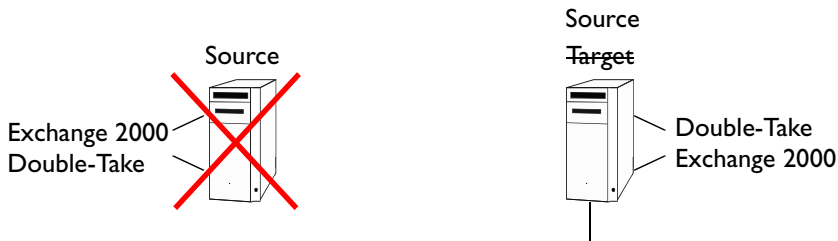


NOTE: Depending on the type of source failure, the source may still be connected to the network. If it is, disconnect it before continuing.

2. Delete the source computer from Active Directory by removing the source from **Active Directory Users and Computers**. This is required before the target can be renamed to the source.

NOTE: While ADSIEdit will let you rename the source computer object, if you do that, you will not be able to rename the target afterwards. You must delete the source computer to proceed.

3. Rename the target machine to the Exchange server (source machine) name and reboot.



4. After the reboot, start the Exchange services on the target by using the script you created earlier.

NOTE: If any of the services fail to start the first time, you may need to retry them.

-
5. Mount any data stores that are not mounted. (Open the Exchange System Manager and select **Site, Servers, Source Server, Storage Groups**. Right-click each store that is not mounted (those marked with a red icon) and select **Mount Store**.)
 6. If DNS is being used, modify the mapping for the source computer to point to the target computer. Otherwise, change the IP address on the target to match the original source address.

Exchange is now running on your target which is standing in for your source machine.

5 Reverting Back to the Original Configuration

It is possible to skip this section by designating the target as your source and using another machine as the new target, but if you prefer to revert back to your original source machine, use these instructions.

1. Resolve the original source machine issues, but verify that it is not connected to the network. If it is, disconnect it.



2. Make sure that Exchange is not running on the original source machine. If it is, stop it and dismount the data stores.
3. On the source, set all of the Exchange Services to manual startup. By default, this includes:
 - ◆ Microsoft Exchange System Attendant
 - ◆ Microsoft Exchange Routing Engine
 - ◆ Microsoft Exchange Information Store
 - ◆ Microsoft Exchange MTA Stacks
 - ◆ Microsoft Exchange IMAP
 - ◆ Microsoft Exchange POP3Set those services that are relevant for your environment to manual startup.
4. Create another script like the one on the target (or copy the one from the target) to start the Exchange services that are relevant for your environment.

```
rem Sample script to start all of the default Exchange services
rem Modify this script to start the services used in your environment

net start MExchangeSA
net start RESvc
net start MExchangeIS
net start MExchangeMTA
net start IMAP4Svc
net start POP3Svc
```

NOTE: The services must be started in the order shown.

-
5. While the original source is not connected to the network, open the Double-Take Management Console on the source and disconnect your replication set by right-clicking on the connection and selecting **Disconnect**.

WARNING: At this time, you will be taking the target, and thus Exchange, offline. Users will be unable to access Exchange until you have completed the remaining steps in section 5.

6. Rename the target back to its original name and reboot.



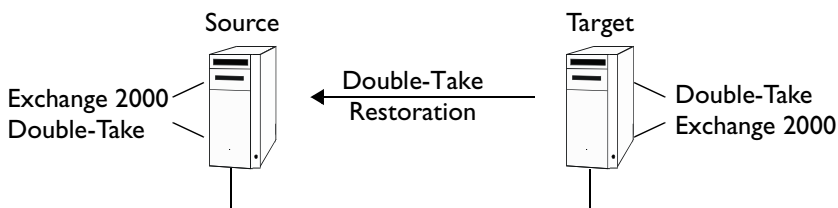
NOTE: Make sure that the target has at least shutdown in the reboot process before continuing.

7. Reconnect the original source machine to the network.



8. In order for Active Directory to locate the original source on the network, you must remove it from the domain and then add it back in.
 - a. Right-click **My Computer** and select **Properties**. Select the **Network Identification** tab and click **Properties**. Under **Member of**, change to **Workgroup** and specify a workgroup name. Click **OK**. Do not reboot when prompted.
 - b. Since you specified no to the reboot, you will be returned to the Network Identification tab. Click **Properties** again and add the machine back to the domain.
 - c. Now you should reboot the source machine.
9. After the reboot, log on as the local administrator.

-
10. Restore the changes that were made on the target server while it was standing in for the source.
 - a. Open the Double-Take Management Console on the target and select **Tools, Restoration Manager**.
 - b. Complete the appropriate fields as described:
 - ◆ **Original Source**—The name of the source machine where the data originally 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.
 - c. Verify that the data is being returned to the same locations on the source where it was originally stored. For detailed information on the restoration options, see the *Double-Take User's Guide*.
 - d. 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.



NOTE: You will want to configure your restoration process so that orphan files on the original source are deleted or moved. See the *Double-Take User's Guide* for detailed instructions on orphan files.

11. After the restoration is complete, the connection will automatically disconnect.
12. After the restoration connection has disconnected, start the Exchange services on the source by using the script you created earlier.

NOTE: If any of the services fail to start the first time, you may need to retry them.

13. Mount any data stores that are not mounted. (Open the Exchange System Manager and select **Site, Servers, Source Server, Storage Groups**. Right-click each store that is not mounted (those marked with a red icon) and select **Mount Store**.)
14. If you modified DNS with a new mapping for the source, remap the source to its original address.

At this time, your configurations are back to the original states.



Now that you have been through the process once, to repeat it, you only have to reconnect your replication set that you created under [Configuring Double-Take](#) on page 8 and you will be protected once again.

NOTE: You will want to configure your new connection so that orphan files on the target are deleted or moved. See the *Double-Take User's Guide* for detailed instructions on orphan files.

Appendix I—Locating Your Exchange Files

If you do not know where all of your Exchange .log and .db files are located, use the following instructions to determine the locations.

1. Open Exchange System Manager (**Start, Programs, Microsoft Exchange, System Manager**).
2. Expand the **Administrative Groups** folder by clicking the plus sign.
3. Expand the information for your Exchange site name by clicking the plus sign next to the Exchange domain name folder.
4. Expand the server information by clicking the plus sign next to **Servers**.
5. Expand the server you want to view or administer by clicking the plus sign next to the server name.
6. Right-click the **First Storage Group** folder and select **Properties**.
7. The **Transactional log location** and **System path location** will be identified on the General tab. Record this information.
8. Click **Cancel**.
9. Expand the **First Storage Group** folder by clicking the plus sign next to the storage group name.
10. Right-click **Mailbox Store** and select **Properties**.
11. Select the Database tab. The **Exchange database** and **Exchange streaming database** will be identified. Record this information.
12. Click **Cancel**.
13. Right-click **Public Folder Store** and select **Properties**.
14. Select the Database tab. The **Exchange database** and **Exchange streaming database** will be identified. Record this information.
15. Click **Cancel**.

Repeat these steps for all stores and storage groups to determine the locations of all of your files.

Appendix II—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.