



## **Guidelines for Protecting Data Using Double-Take<sup>®</sup> with Microsoft<sup>®</sup> System Center Data Protection Manager (DPM) Replicas**



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## Double-Take<sup>®</sup> Support for Application Failover

The Double-Take<sup>®</sup> 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 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 Double-Take, and Double-Take Software offers 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.

Double-Take 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, Double-Take 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 Double-Take Software has no direct access to or experience with a particular application or configuration, Double-Take 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, Double-Take 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 Double-Take Software to any obligation. Although we try to provide quality information, Double-Take Software makes no claims, promises or guarantees about the accuracy, completeness, or adequacy of the information contained in this document.

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# I. Document Overview

This document is a Double-Take® application note. An application note provides guidelines on the use of Double-Take in a specific environment.

This document contains:

- ◆ **Document Overview**—Explains what an application note contains, how it should be used, what you need to know before trying to use the application note, and where you can go for more information.
- ◆ **Solution Overview**—Explains how the application works with Double-Take and describes the considerations that you must weigh when implementing your Double-Take solution. Review this section to make sure that you understand the theory involved with using Double-Take and your application. Includes both basics, such as system requirements, as well as configuration and environment-specific topics, such as interactions with specific clients or special considerations for WAN (Wide Area Network) environments. Pay special attention to those topics that are directly related to your environment.
- ◆ **Sample Implementations**—Describes specific examples of how to use Double-Take for this solution. This includes information about the specific system setup used in the sample implementation. Use these procedures as a guideline for creating your own implementation. Because no two environments or configurations are exactly the same, you will probably need to implement additional or different steps than what is documented here in order to make the solution work in your environment.

## I.1. Audience

This document is written for network and application administrators who have a working understanding of the applications and environments where the Double-Take solution is to be deployed. You may need to expand on the documented information in order to customize the solution to fit your environment.

Before you use this application note, you should have an understanding of:

- ◆ Double-Take
- ◆ SQL Server™

## I.2. Expectations

Application notes are intended to provide a framework for configuring a Double-Take solution in a specific environment and to draw attention to decisions you will need to make when configuring your solution.

Because there are an infinite number of possible configuration, network, and environment scenarios, application notes contain general configuration guidelines as well as an example configuration procedure that has been tested for a specific environment.

This document assumes that you are comfortable working with your operating system, Double-Take, and SQL Server.

## I.3. Related documentation

Before you begin to configure your solution, make sure that you have complete documentation for your operating system, application, and Double-Take. This application note does not provide step-by-step instructions for using standard operating system, application, and Double-Take functionality.

The following documents contain additional information that you may need while setting up this solution:

- ◆ Double-Take *User's Guide* or online documentation
- ◆ Reference guides or documentation for SQL Server

## I.4. Getting help

Double-Take Software has application notes that describe how to configure Double-Take with a variety of popular third-party applications. These application notes are available on the Application Notes page of the Double-Take Software support web site (<http://support.doubletake.com>).

For help using Double-Take, refer to the Double-Take online manual or online help.

Double-Take Software offers professional services on a fee basis to assist you in identifying the best practices for implementing a solution in your environment. Visit <http://www.doubletake.com/what-we-offer/services/> for more information.

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## 2. Solution Overview

Microsoft® System Center Data Protection Manager (DPM) is a disk-based backup/tape backup enhancement tool for file servers which takes advantage of and builds upon Volume Shadow Copy Service (VSS) technology. DPM provides access to multiple point-in-time snapshots of protected data, allowing recovery of older versions of a document in case the newest version is accidentally deleted or becomes corrupt. End users can recover their own data residing either on the protected file server or the DPM server in the same way as they could with VSS-protected data.

Double-Take® provides real-time enterprise data protection and replication. It provides disaster recovery and high availability for the data, thus enhancing the functionality of DPM.

This document describes how Double-Take can be used with DPM to protect DPM replicas, provide high availability for protected data, or to provide centralized backup for multiple domains, in addition to the standard protection that Double-Take offers for production data and applications.

This document does not explain how to protect DPM itself, but instead, it describes how to protect the DPM-protected file server data. (The DPM replicas are copies of the file server data.) The high availability for DPM-protected file server data scenario describes how to provide high availability for the file server data, not for DPM itself.

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**NOTE:** 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 DPM.

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### 2.1. Requirements

Each DPM server must meet the following requirements:

- ◆ A licensed copy of Windows® Server 2003 with Service Pack 1 or later
- ◆ Microsoft SQL Server 2000 with Service Pack 3a (SP3a) or later

Each protected file server must meet the following requirements:

- ◆ Windows Server™ 2003 with SP1 or later or Windows 2000 Server with SP4 and either Windows 2000 Update Rollup Pack 1 or Microsoft hotfix 894608

Each Double-Take server must meet the following requirements (the Double-Take server may be either a DPM server or file server, depending on the configuration):

- ◆ A licensed copy of Double-Take version 4.4 or later with the latest service pack

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**NOTE:** The DPM server and file servers must be members of the same Windows Active Directory® domain.

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### 2.2. Configurations

Within a single Windows domain, one or more DPM servers may each be protecting the data on one or more file servers, which in turn may themselves have one or more protection groups defined.

The following configurations provide options for ways to enhance DPM protection using Double-Take. See the appropriate section later in this document for instructions on setting up Double-Take.

#### 2.2.1. Protecting DPM replicas

This scenario is useful in a situation where data on the DPM server itself as well as one or more protected servers is lost. Since such a situation may occur as a result of a site-wide disaster, the data will likely be replicated to an off-site target.

In this scenario, the DPM server is the Double-Take source, and another server that does not have DPM installed is the Double-Take target. The replica data (which is a copy of the protected file server data) from the DPM server is replicated to the target. VSS may be enabled on the target server to allow for the creation of multiple snapshots of the target data.

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**NOTE:** Instructions for enabling VSS are outside the scope of this document. See the *Guidelines for Protecting Data using Double-Take with Volume Shadow Copy Service (VSS)* application note for more information.

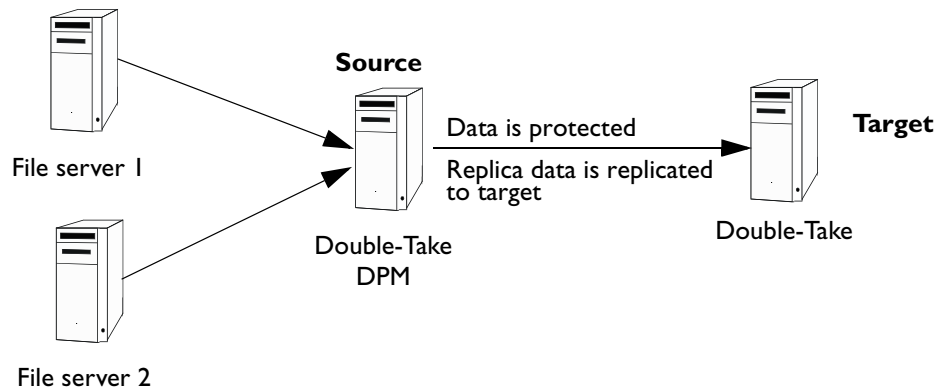
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The saved data is used to rebuild the protected file servers, not the DPM server itself. Since this scenario does not include Double-Take on the protected file servers, the actual restore target for Double-Take is the rebuilt DPM server.

If the DPM server is not damaged, use Double-Take to restore the DPM replicas to the DPM file server, then restore directly to file servers from the DPM replicas.

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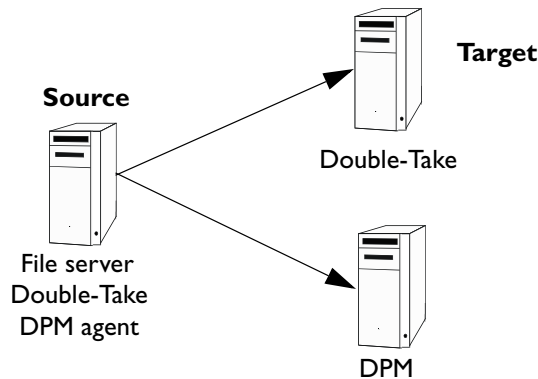
If both the protected file server and the DPM server need to be recovered, follow the disaster recovery recommendations in the Microsoft DPM documentation. After the server has been rebuilt, use Double-Take to restore the DPM replicas to the DPM file server.



### 2.2.2. Providing high availability for DPM-protected file server data

While DPM can be configured to provide hourly backups of protected file server data, it does not provide high availability for the protected data. In this scenario, Double-Take may be used to supplement DPM so that users have access to the DPM-protected file server data if the file server is down. The source server would be the DPM-protected file server, and the target could be any server.

After the original DPM-protected file server is brought back online, the data may be restored to the source by Double-Take, and DPM will automatically pick up the changes to the data on the next scan.



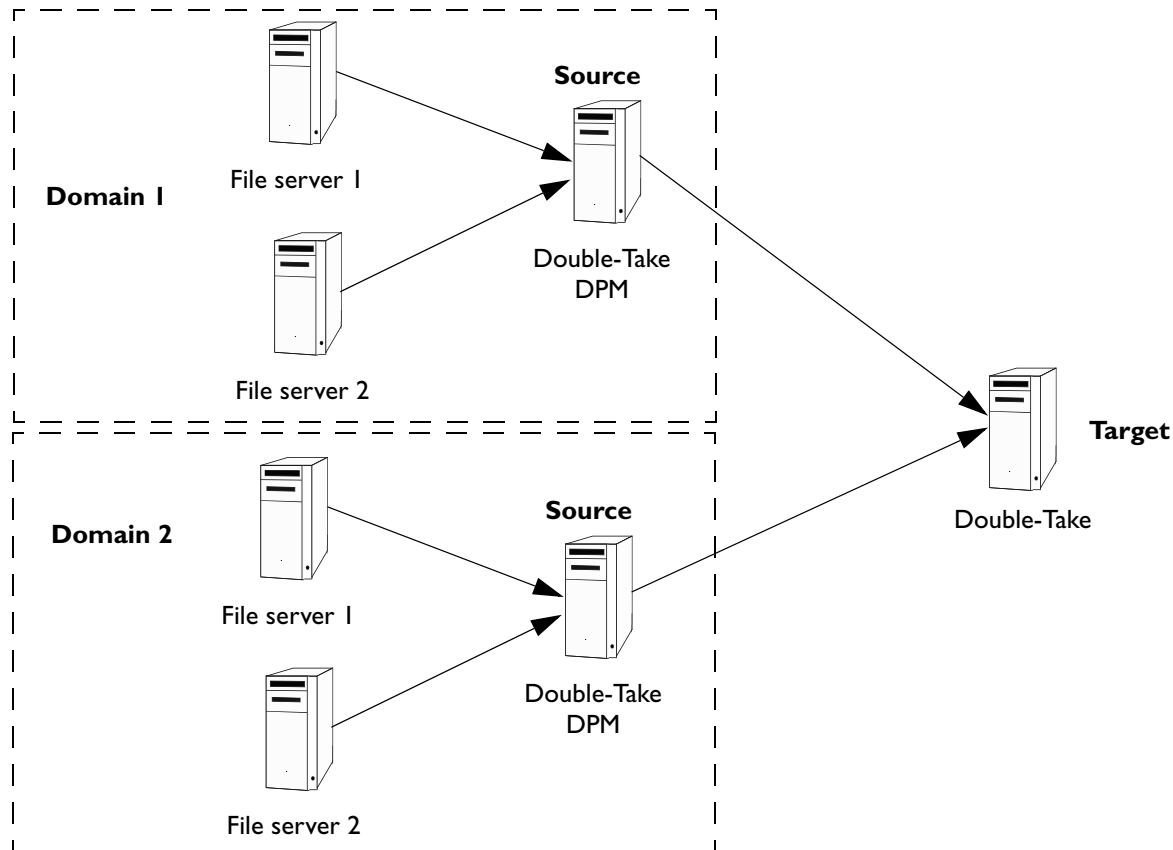
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**NOTE:** DPM does not automatically back up data on the target server after failover. If you want DPM to protect the data on the target, you will need to configure DPM and deploy the DPM agent to scan the target using the target hostname just as you would when setting up any other server with DPM.

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### 2.2.3. Provide centralized backup for multiple domains

Since DPM only operates within a single Windows domain, backup centralization/enhancement using DPM can only occur within a single domain as well. In an environment containing multiple domains each protected by DPM, Double-Take may be used to centralize backups by replicating the DPM-protected data from multiple DPM servers to a single server. The Double-Take source machines are the DPM servers, and the target machine is a non-DPM server from which the tape backup is performed.



### 2.3. Configuring memory usage

Double-Take uses memory to queue operations and data on both the source and target. Since the source server is typically running a production application, it is important that the amount of memory Double-Take and the other applications use does not exceed the amount of RAM in the system. If the applications require more memory than there is RAM, the system will begin to swap pages of memory to disk and the system performance will degrade.

For instance, SQL Server will use all of the available system memory when needed by default, and it may use almost all of the system memory during high-load operations. These high-load operations are precisely what cause Double-Take to need memory to queue the data being changed by SQL Server. On a server with 1 GB of RAM running SQL Server and Double-Take, you might configure SQL Server to use only 512 MB and Double-Take to use 256 MB, leaving 256 MB for the operating system and other applications on the system. Many other server applications will use almost all system memory by default, so it is important to check and configure applications appropriately, particularly on high-capacity servers.

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## 3. Sample Implementations

### 3.1. Protecting DPM replicas

Complete these steps to create the Double-Take replication set and establish the connection between the source and target.

1. Install Double-Take on the DPM server (the Double-Take source).
2. Install Double-Take on the non-DPM server (the Double-Take target).
3. On the source, select **Start, Programs, Double-Take, Management Console**.
4. Double-click your source machine to log on.
5. Right-click the source machine and select **New, Replication Set**. Enter the desired name for the replication set (such as `dpm_data`).
6. Add the following directory to the replication set (the exact path may vary depending on where DPM is installed):  
`C:\Program Files\Microsoft Data Protection Manager\2006\Volumes\Replica`

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**NOTE:** Even though DPM data is stored on volumes managed by DPM, the volumes are exposed as mount points through this directory.

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7. Right-click the replication set name and select **Save** to save the replication set.
8. Drag and drop the replication set onto the target. The Connection Manager dialog box opens.
9. Click **Connect** to start the mirror and replication processes.

Your data is protected after the mirror is complete and the Mirror Status has changed to **Idle**.

For more information about rebuilding and recovering DPM, refer to your DPM documentation.

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- NOTE:**
- ◆ When the DPM server is restored, you should use the DPM replica data protected by Double-Take rather than a more out-of-date copy from an existing backup system.
  - ◆ While this document outlines how to protect the DPM replicas, it is also important to have recent copies of the DPM server's system state and the DPM SQL configuration databases in case you need to perform a complete DPM recovery.
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### 3.2. Providing high availability for DPM-protected file server data

#### 3.2.1. Configure and begin mirroring and replication

Complete these steps to create the Double-Take replication set and establish the connection between the source and target.

1. Install Double-Take on the DPM-protected file server (the Double-Take source).
2. Install Double-Take on the non-DPM server (the Double-Take target).
3. On the source, select **Start, Programs, Double-Take, Management Console**.
4. Double-click your source machine to log on.
5. Right-click the source machine and select **New, Replication Set**. Enter the desired name for the replication set (such as `dpm_data`).
6. Add the directories protected by DPM (those included in the protection group(s)) to the new replication set.
7. Right-click the replication set name and select **Save** to save the replication set.
8. Drag and drop the replication set onto the target. The Connection Manager dialog box opens.
9. Select **One to One** to map the replication set data from the source to an identical volume/directory structure on the target.
10. Click **Connect** to start the mirror and replication processes.

Your data is protected after the mirror is complete and the Mirror Status has changed to **Idle**.

#### 3.2.2. Configure failover monitoring

1. Select **Start, Programs, Double-Take, Failover Control Center**.



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2. 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, click **OK**, and then click **Login**.
  3. To add a monitor for the selected target, click **Add Monitor**. Type the name of the source machine or click **Browse** to select it, and click **OK**. The Monitor Settings window will open.
  4. In the Monitor Settings window, select the IP address that is going to failover and verify that **Adding Source Identity to Target** is selected.
  5. Select the **Share(s)** checkbox under **Items to Failover** if it is not already selected.
  6. Click **OK** to go back to the Monitor Settings dialog box and then click **OK** to begin monitoring the source machine.

In the event of a source machine failure, your target machine is now ready to stand in for your source. For information on monitoring failover, see the *Double-Take User's Guide*.

### 3.2.3. Restoring your 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.

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**NOTE:** If you must rebuild your hard drive, continue with step 3.

If you do not need to rebuild your hard drive, verify that the Double-Take connection on the source has been disconnected (right-click the connection in the Double-Take Management Console and select **Disconnect**) and then continue with step 4.

3. If you must rebuild your hard drive, complete the following. If you do not need to rebuild your hard drive, skip this step and continue with step 4.
  - a. Install Windows. Since your source machine is not connected to the network, go ahead and use the source's original name and IP address.
  - b. Install Double-Take using the installation defaults.
4. On the target, select **Start, Programs, Double-Take, Failover Control Center**.
5. Select the target machine that is currently standing in for the failed source.
6. Select the failed source and click **Failback**.
7. You will be prompted to determine if you want to continue monitoring the source server. Do not choose **Continue** or **Stop** at this time.

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**NOTE:** Verify that the Double-Take connection on the source has been disconnected. (On the source, right-click the connection in the Double-Take Management Console and select **Disconnect**.)

8. Connect the source machine to the network.
9. After the source is back online, select whether or not you want to continue monitoring this source machine (**Continue** or **Stop**).
10. To begin the restoration process, open the Double-Take Management Console and select **Tools, Restoration Manager**.

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**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.

11. Complete the appropriate fields as described below.
  - ◆ **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 the data will be restored. This may or may not be the same as the original source machine.
12. 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*.

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13. 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.

14. Re-establish the Double-Take replication set connection.

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

After the source machine is restored and online, DPM will resume its normal protection schedule.

### 3.3. Providing centralized backup for multiple domains

On the central backup server:

1. Install Double-Take. This will serve as the Double-Take target.

For **each** DPM source server, do the following:

1. Install Double-Take. Each DPM server will act as a Double-Take source.

2. On the source, select **Start, Programs, Double-Take, Management Console**.

3. Double-click the source machine to log on.

4. Right-click the source machine and select **New, Replication Set**. Enter the desired name for the replication set (such as `dpm_data`).

5. Add the following directory to the replication set (the exact path may vary depending on where DPM was installed):  
`C:\Program Files\Microsoft Data Protection Manager\2006\Volumes\Replica`

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

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

8. Select **All to One** so that the data from each source is replicated to a directory structure that contains the source's hostname, which will prevent conflicts between data from multiple sources.

9. Click **Connect** to start the mirror and replication processes.

Your data is protected after the mirror is complete and the Mirror Status has changed to **Idle**. All data changes that are synced to the DPM server are replicated to the Double-Take repository in real time (that is, as soon as DPM receives the data).

The consolidated data from each server may then be backed up to tape from the central backup server. See the *Double-Take Scripting Guide* for further information about how to integrate Double-Take with third-party backup software.