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VFM™ (Virtual File Manager) 5.6 Namespace Guide

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Preface

What the guide covers

This document describes how you can use VFM™ (Virtual File Manager) technology to simplify file management and increase data availability while reducing storage costs. It describes how to create and manage a Microsoft® Distributed File System (DFS) global namespace. It begins with instructions about how to create DFS roots and links and how to quickly populate the namespace with namespace creation and permission based policies. The guide explains how to make the namespace highly available and how to automatically back up your namespace by creating namespace availability and namespace backup policies, respectively. The guide also explains how to create multiprotocol namespaces for CIFS and NFS clients and how to virtualize users' home directories.

The guide is divided into the following sections:

- **Chapter 1 Introduction** – Overview of this guide.
- **Chapter 2 The DFS Namespace** – Explains how to create and manage a DFS namespace.
- **Chapter 3 Namespace Creation Policies** – Explains how to use VFM to easily populate and maintain a logical namespace.
- **Chapter 4 Permission Based Policies** – Explains how to use VFM to easily populate the namespace based on group permissions of shares.
- **Chapter 5 Namespace Availability Policies** – Explains how to synchronize the logical structure of DFS roots to make the namespace highly available.
- **Chapter 6 Multiprotocol Namespace Policies** – Explains how to create and manage multiprotocol namespaces for CIFS and NFS clients.
- **Chapter 7 Home Folder Policies** – Explains how to virtualize users' home directories.
- **Chapter 8 Namespace Backup Policies** – Explains how to automatically back up your namespace.
- **Appendix** – Provides a list and description of the VFM guides.
- **Glossary** – Provides definitions of terms used in this guide.

Audience

This guide is for network administrators who are familiar with Windows NT®, Windows® 2000, Windows Server™ 2003, and DFS. It does not cover basic system or network administration topics.

Typographic conventions

- **Bold** text - Items on a dialog box or page on the VFM console that you are instructed to click.
- *<text in italics>* - Substitute the text within the greater than and less than symbols with the value requested.

Using the online help

- Certain icons appear to the left of a topic title to indicate that the information provided applies only to a specific operating system, type of DFS root, or data transfer protocol.

Icon	Description
Win2K	Indicates that the information applies only to DFS roots on Windows 2000 or Windows Server 2003, Enterprise Edition.
domain root	Indicates that the information applies only to domain-based roots.
W2K3	Indicates that the information applies only to DFS roots on Windows Server 2003.
CIFS	Indicates that the information applies only to CIFS data transfer.

- In the table of contents, a new topic is represented as a page with a red asterisk , and an entire section of new topics is represented as a book with a red asterisk .
- Definitions of new terms are available wherever they appear in help topics. The first time a new term appears in a help topic, it appears as a green hyperlink.
- Context help contains detailed information about a dialog box or view, and might include links to related topics. Press **F1** or click **Help**.

Support

Contact NetApp® technical support, 24 x 7.

Support is either through the web at http://now.netapp.com or by phone. See http://www.netapp.com/support for details.

Support phone numbers:

- 888 4-NETAPP (US and Canada)
- (1-888-463-8277)
- (408) 822-4700
- 800-44-NETAPP (EMEA/Europe)
- 800-800-0800 (Asia/Pacific)

Notes:

- You can also contact technical support by clicking **Support** on the **Help** menu.
- To get your product build number and license information, click **About Virtual File Manager** on the **Help** menu.

Enter new license key

Enter a new license key for the VFM client and server components when you want to extend the VFM evaluation period or when you purchase additional

licenses from VFM.

1. Contact NetApp to request a new license key.
2. On the **Help** menu, click **About Virtual File Manager**.
3. Click **Edit Serial Numbers**.
4. In the License Type list, click the appropriate item.
5. If you selected "Evaluation" as the license type, type the new activation key.
6. If you selected "Full" as the license type, select a product number from the Product list and type the new activation key.
7. Click **OK**.

Chapter 1 Introduction

This guide explains how to create and manage a logical namespace. It begins with instructions about how to create Distributed File System (DFS) roots and links and how to quickly populate the namespace with namespace creation and permission based policies. The guide provides instructions about how you can make the namespace highly available and how to automatically back up your namespace by creating namespace availability and namespace backup policies respectively. The guide also explains how to create multiprotocol namespaces for CIFS and NFS clients and how to virtualize users' home directories.

The guide is arranged in the following sections:

- For basic requirements and general information about DFS and instructions about how to create a DFS namespace, see “Chapter 2 The DFS namespace.”
- For instructions about how to automatically populate your namespace, see “Chapter 3 Namespace creation policies.”
- For instructions about how to automatically populate your namespace based on group permissions you specify, see “Chapter 4 Permission based policies.”
- For instructions about how to keep aligned the logical structure of two or more DFS roots or a DFS root and widelink namespaces, see “Chapter 5 Namespace availability policies.”
- For instructions about how to create and manage namespaces for CIFS and NFS clients, see “Chatper 6 Multiprotocol namespace policies.”
- For instructions about how to virtualize users’ home directories, see “Chapter 7 Home folder policies.”
- For instructions about how to back up the logical structure of a namespace, see “Chapter 8 Namespace backup policies.”

Chapter 2 The DFS Namespace

This chapter explains basic DFS requirements and provides instructions about how to use VFM to create and manage a DFS namespace. The section is arranged according to the elements that make up a namespace, such as roots, links, and link targets. Status monitoring is also covered in this section.

The Logical View tree

The Logical View tree shows the roots, links, and logical folders in your namespace. You manage your namespace from this tree.

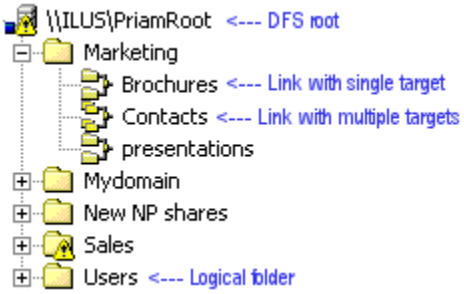


Figure 1 The Logical View tree

Basic DFS requirements

- You can create DFS roots on Windows 2000, Windows Server 2003, or NT4 servers. Domain-based roots replicated through Microsoft File Replication Service (FRS) must be created on partitions formatted with Windows 2000 or Windows Server 2003 NTFS on servers that are part of a Windows 2000 or Windows Server 2003 Active Directory™ Domain.
- Roots are created on NT4 servers during the process of installing DFS on the server. This restriction is removed in the Windows 2000 or Windows Server 2003 version of DFS.
- You can add a DFS link under the DFS root to reference any root, shared folder, or subfolder of a shared folder.
- Linking from one DFS link to another DFS link is possible only if the second link is in a separate namespace. For example, you cannot have \\Server\DFS_root\DFS_link1\DFS_link2 unless DFS_link2 lies under another DFS root.
- You can replicate each DFS root (domain-based only) and shared folder (domain-based and stand-alone) to eliminate single points of failure.
- Administering a stand-alone DFS root requires Local Administrator privileges on the server hosting the root.
- Administering a domain-based DFS root requires Domain Administrator privileges for the domain hosting the root and Local Administrator privileges on each of the servers hosting root targets.
- A consolidation DFS root is a special stand-alone DFS root.

Recommended size limits

Item	Maximum number
Characters per file path	DFS has no inherent limitation on the number of characters in any item of the namespace. Microsoft Win32 APIs have a MAX PATH limitation of 260 characters and applications exceeding this limit fail attempting to access UNCs or directory paths.
Replica members in a domain-based set	See article Q232613 in the Microsoft Windows knowledge base.
DFS roots per server	One root for Windows NT and Windows 2000 servers. Multiple roots for a server running Windows Server 2003 Enterprise Edition. Other DFS-compatible systems might support additional roots per server.
DFS roots per domain	See article Q232613 in the Microsoft Windows knowledge base.
DFS links or shared folders in a DFS root	See article Q232613 in the Microsoft Windows knowledge base.

Additional resources

To read more about DFS, see the following list of recommended web sites.

- **DFS documentation about Windows Server 2003**
  - http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/deployguide/sdccc_fsv_efno.asp
- **DFS documentation about Windows 2000**
  - http://www.microsoft.com/technet/treeview/default.asp?url=/TechNet/prodtechnol/windows2000serv/deploy/confeat/dfsguide.asp
  - http://www.microsoft.com/WINDOWS2000/techinfo/administration/fileandprint/dfsbp.asp
- **DFS documentation about Windows NT**
  - http://www.microsoft.com/NTServer/nts/downloads/winfeatures/NTSDistrFile/AdminGuide.asp

Populating the namespace

VFM provides several ways to populate the namespace. Select a method that best meets your needs.

- Add a link dialog box enables you to add one link at a time.
- Drag UNC paths from Windows Explorer to a root in the DFS tree.

- Add multiple links dialog box enables you to add multiple links and folders at a time. Use this method when you know where items are located on your network and most of the DFS shares that you want to link are located on a few machines. A wizard steps you through the process. You can drag items from Windows Explorer to a folder.
- Namespace Creation Policy wizard enables you to add multiple links and folders at a time. Use this method when you want to add links to multiple shares that are supported by different machines and when you want to keep the logical namespace aligned with subsequent changes in the underlying physical resources.
- Permission Based Namespace wizard enables you to add multiple links and folder at a time like the Namespace Creation Policy wizard. Use this method when you want to populate the namespace based on security permissions of shares.
- Home Folder Policy Creation wizard enables you to create links to users' home directories from information stored in Active Directory or an NT4 domain.

DFS roots

The first step in creating a namespace is to create DFS roots. The DFS root is the top of the logical hierarchy. It can be domain-based or stand-alone. VFM enables you to create domain-based, stand-alone, and a special stand-alone named consolidation root. This section explains how to create and manage these DFS roots.

Domain-based root	Stand-alone root	Consolidation root
Microsoft Active Directory must be configured before you can create the DFS root.	Does not use Microsoft Active Directory.	A special type of stand-alone root that must be hosted on a member server and not a domain controller.
Must be hosted on a domain member server or domain controller.	Can be hosted on Windows NT 4 and three types of Windows 2000 servers: a stand-alone server, a member server, or a domain controller.	Must be hosted on Windows Server 2003. It is recommended that you host the root on Windows Server 2003, Enterprise Edition or Windows Server 2003, Datacenter Edition.
Can have root-level replicas.	Cannot have root-level replicas.	
Can be the target of a DFS link.	Can be the target of a DFS link.	• Cannot be the target of a DFS link. • Does not support link names with "\" characters (for example, abc\def).
Shared folders can be hosted on any type of	Shared folders can be hosted on any type of Microsoft	

Domain-based root	Stand-alone root	Consolidation root
Microsoft server, or any other server software for which a Windows NT-based client is available. This includes any version of Windows NT Server or Windows NT Workstation, NetWare®, Windows 95, Windows 98, Windows 2000, Windows Server 2003, Windows for Workgroups, LAN Manager, or NFS. **Notes:** • Only Windows 2000 and Windows Server 2003 clients support access to domain-based DFS roots in Microsoft Active Directory. You must update Windows NT 4.0, Windows 95, and Windows 98 clients with appropriate service packs before they can connect to domain-based roots. • Windows 95 and Windows 98 clients can only negotiate referrals for Server Message Block (SMB) shares. All other targets appear as empty directories.	server, or any other server software for which a Windows NT-based client is available. This includes any version of Windows NT Server or Windows NT Workstation, NetWare, Windows 95, Windows 98, Windows 2000, Windows Server 2003, Windows for Workgroups, LAN Manager, or NFS. **Notes:** • Windows 95 and Windows 98 clients can only negotiate referrals for SMB shares. All other targets appear as empty directories.	
Supports multiple target links.	Supports multiple target links.	
Can make use of FRS replication.	FRS replication not available.	

Note: Windows Server 2003, Enterprise Edition, can host multiple DFS roots. To manage this configuration, VFM must be installed on Windows XP Professional or on Windows Server 2003.

Create a stand-alone DFS root

- Microsoft DFS server software (Distributed File System Service "dfssvc.exe") must be running on the server that hosts the DFS root.
- You must have administrator permissions for the server where you create the DFS root.
- Windows 2000 and NT4 servers can only host one DFS root.
- VFM can create roots on Windows 2000 and Windows Server 2003 servers. Roots on NT 4 systems are typically created during the installation process and cannot be created using VFM.
- Windows Server 2003, Enterprise Edition, can host multiple DFS roots. To manage this configuration, VFM must be installed on Windows XP Professional or on Windows Server 2003.

1. Perform one of the following actions:
   - Right-click Logical View and click **Add a new DFS root**.
   - Click **Create DFS root**.
   - On the **Tools** menu, click **Add a new DFS root**.
2. Click **Next**.
3. In the **Server name** field, type the name of the server where you want to create the DFS root, or click **Browse** to select an available server.
4. Click **Next**.
5. Select **Create a Stand-alone DFS root** and then click **Next**.
6. Select an existing shared folder or create a new shared folder.
   - If you clicked **Use an existing shared folder**, type the path and name of the shared folder or select an available shared folder.
   - If you clicked **Create a new shared folder**, type the path and name of the shared folder in the appropriate fields.

   The name of the DFS root is the same as the shared folder you selected.
7. Click **Next**.
8. In the **Comment** field, optionally type a word or phrase.
9. In the **Clients cache this referral for** field, optionally change the duration (in seconds) that the root is cached on a DFS client and then click **Next**.
10. Verify the information and then click **Finish**. The new DFS root appears in the Logical View tree.

Create a domain-based root

- Microsoft DFS server software (Distributed File System Service "dfssvc.exe") must be running on the server that hosts the DFS root.
- Microsoft Active Directory must already be operational.
- The account used for VFM must have administrator permissions for both the domain and the server where you create the DFS root.
- When creating domain-based roots, it is strongly recommended that you run VFM on a system that is a member of the domain that hosts the root. Name resolution problems and permission problems often manifest themselves in scenarios where the administrative machine resides in an NT4 domain and is attempting to create a domain-based root in a separate Active Directory domain.
- Windows 2000 servers can only host one DFS root.
- Windows Server 2003, Enterprise Edition, can host multiple DFS roots. To manage this configuration, VFM must be installed on Windows XP Professional or on Windows Server 2003.

1. Perform one of the following actions:
    - Right-click Logical View and click **Add a new DFS root**.
    - Click **Create DFS root**.
    - On the **Tools** menu, click **Add a new DFS root**.
2. Click **Next**.
3. In the **Server name** field, type the name of the server where you want to create the DFS root or click **Browse** to select an available server.
4. Click **Next**.
5. Select **Create a domain-based DFS root** and click **Next**.
6. Select an existing shared folder or create a new shared folder.
    - Best practices dictate that the share name used should match the name of the root that is being created.
    - If you clicked **Use an existing shared folder**, type the path and name of the shared folder or select an available shared folder.
    - If you clicked **Create a new shared folder**, type the path and name of the shared folder in the appropriate fields.
7. Click **Next**.
8. In the **DFS root name** field, optionally type a name for the root (follow file naming conventions of the operating system of the server).
9. Optionally type a word or phrase in the **Comment** field.
10. In the **Clients cache this referral for** field, optionally change the duration (in seconds) that the root is cached on a DFS client and then click **Next**.
11. Verify the information.
12. Click **Finish**. The new DFS root appears in the DFS Tree window.

Create a consolidation root

Consolidation DFS roots are special stand-alone roots that enable you to move files referenced in UNC paths embedded in links, in line-of-business applications, and in other places without affecting users. The consolidation root redirects the user from the old location referenced by the UNC path to the new location. For an illustration about how consolidation roots work, see "How consolidation DFS roots work."

Prerequisites

- Microsoft DFS server software (Distributed File System Service "dfssvc.exe") must be running on the server that hosts the DFS root.
- You must install a software update that enables you to host a consolidation root on the server you select. Contact Microsoft for the software update. After you apply the software update, you must restart the Distributed File System service. For more information about consolidation roots, see Microsoft Knowledge Base Article 829885.
- Before you configure the consolidation root, you must rename the server to be consolidated. See "How consolidation DFS roots work" for clarification.
- The consolidation roots must be installed on Windows Server 2003. It is recommended that you host the root on Windows Server 2003, Enterprise Edition or Windows Server 2003, Datacenter Edition.
- The consolidation root must be hosted on a member server and not a domain controller because the server consolidation logic is disabled if the root is hosted on a domain controller.
- The NETBIOS name of the server that hosts the consolidation root must be the same as the host name part of its fully qualified domain name (FQDN).
- The consolidation of UNC paths from two servers that have the same host name is not supported. For example, you cannot consolidate two servers that are named *server1.npd.com* and *server1.<subdomain>.npd.com*.
- The account used for VFM must have administrator permissions for the server where you create the DFS root.
- Windows Server 2003, Enterprise Edition, can host multiple DFS roots. To manage this configuration, VFM must be installed on Windows XP Professional or on Windows Server 2003.

To create a consolidation root:

Notes:

- To clarify the instructions about how to configure a consolidation DFS root, the following examples are used:
  - The server that hosts the consolidation DFS root is named *ConsolidationServer*.
  - The server to be consolidated is named *Server1*. *Server1* is renamed to *OldServer1* before the consolidation DFS root is created.
  - Data is migrated from *OldServer1* to *ConsolidationServer*.

1. Perform one of the following actions:
   - Right-click Logical View and click **Add a new DFS root**.
   - Click **Create DFS root**.
   - On the **Tools** menu, click **Add a new DFS root**.
2. Click **Next**.
3. In the **Server name** field, type the name of the Windows Server 2003 server that will host the DFS root or click **Browse** to select an available server. For example, you would type *ConsolidationServer*.
4. Click **Next**.
5. Select **Create a DFS Consolidation root**, and then click **Next.**
6. In the **Server name** field, type the original name of the CIFS server that you want to consolidate. For example, you would type *Server1*.
7. In the **Local Path of New Share** field, type the path of the share on the server hosting the root that will contain the root configuration information.
8. Click **Next**. VFM uses the name of the server you want to consolidate as the name of the share of the consolidation root. The share name is preceded by a hash (#) character. For example, *\\ConsolidationServer\#Server1* would be the name of the consolidation DFS root.
9. Optionally type a word or phrase that best describes the root in the **Comment** field.
10. Optionally change the duration (in seconds) that the root is cached on a DFS client and then click **Next**.
11. Click **Finish**. The root appears in the Logical View tree.
12. After you create the root, you must perform the following actions:
    - Make sure that **Automatically update DHCP client information in DNS** is selected on the DHCP server.
      - If you use a Microsoft Windows 2000 DHCP server, make sure that the **Automatically update DHCP client information in DNS** check box <u>is selected only at the server level</u> and not selected at the DHCP scope level.

- If you use a Microsoft Windows 2003 DHCP server, make sure that the **Enable DNS dynamic updates according to the settings below** check box is selected only at the server level and not selected at the DHCP scope level.
- To clear the DHCP scope level, perform the following actions:
  1. On the DHCP server, click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **DHCP**.
  2. Expand the DHCP server name, right-click the first Scope on the list, and then click **Properties**.
  3. Click the **DNS** tab.
  4. For a Microsoft Windows 2000 DHCP server, clear the **Automatically update DHCP client information in DNS** check box. For a Microsoft Windows 2003 DHCP server, clear the **Enable DNS dynamic updates according to the settings below** check box.
  5. Repeat Steps 2 through 4 for each DHCP scope.

- On the Windows Internet Name Service (WINS) server, verify that static WINS entries do not exist for the server to be consolidated. For example, you would make sure that WINS entries do not exist for *Server1*. If WINS entries exist, delete them. For more information about how to delete static WINS entries, contact Microsoft.
- From a command-line prompt on the server hosting the consolidation DFS root, type the following command:

```
ipconfig /registerdns
```

- Restart the Server service on the server hosting the consolidation DFS root.

Notes:

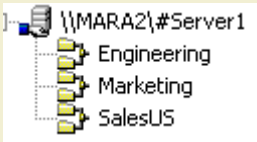
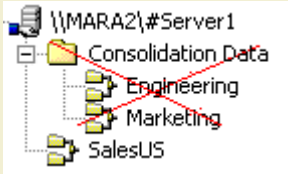
- Optionally log a system event every time that the DFS root consolidation server successfully resolves a referral. The log enables you to see which clients are accessing the consolidated data through the old server name.
  1. Locate and then click the following registry key:

     HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Dfs\Parameters\Replicated
  2. On the **Edit** menu, point to **New**, and then click **DWORD Value**.
  3. Type **LogServerConsolidation** and then press ENTER.
  4. In the **Value data** box, type **1** and then click **OK**. This will log the logical path and the client's IP address to the system event log as event ID: 14318. Allocate sufficient space to the system log. Microsoft recommends that you set the system event log to at least 64 megabytes. Make sure to set the system event log to overwrite events as needed.
- To configure a consolidation DFS root in a cluster server environment, see the Microsoft

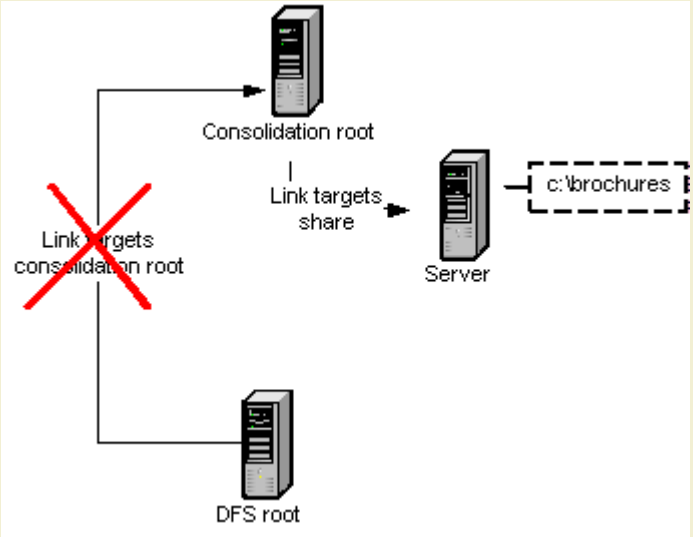
Knowledge Base Article 829885.

- After you create the consolidation DFS root, migrate the data to the new location by creating a migration policy and create links under the consolidation root that target shares in the new location that will be redirected. For example, a link under the consolidation root *ConsolidationServer**#Server1* would target the location of a share on *ConsolidationServer*. See "Create a migration policy" in the VFM Data Movement Policies Guide and "Add multiple links" in this guide for instructions about how to configure a migration policy and add links to the consolidation root.

- Links in a consolidation root cannot be referenced under a logical folder. Links must always be directly under the consolidation root. If you try to access a link under a logical folder, you get the error "No network provider accepted the given path."

Correct configuration of a consolidation root. Links are listed directly under the root. 	**Incorrect configuration of a consolidation root.** The targets of links "Engineering" and "Marketing" cannot be accessed because they are configured under the logical folder "Consolidation Data." 

- The target of a link of a consolidation root must be a share. A consolidation root cannot be the target of a link of a DFS root. See the following illustration.

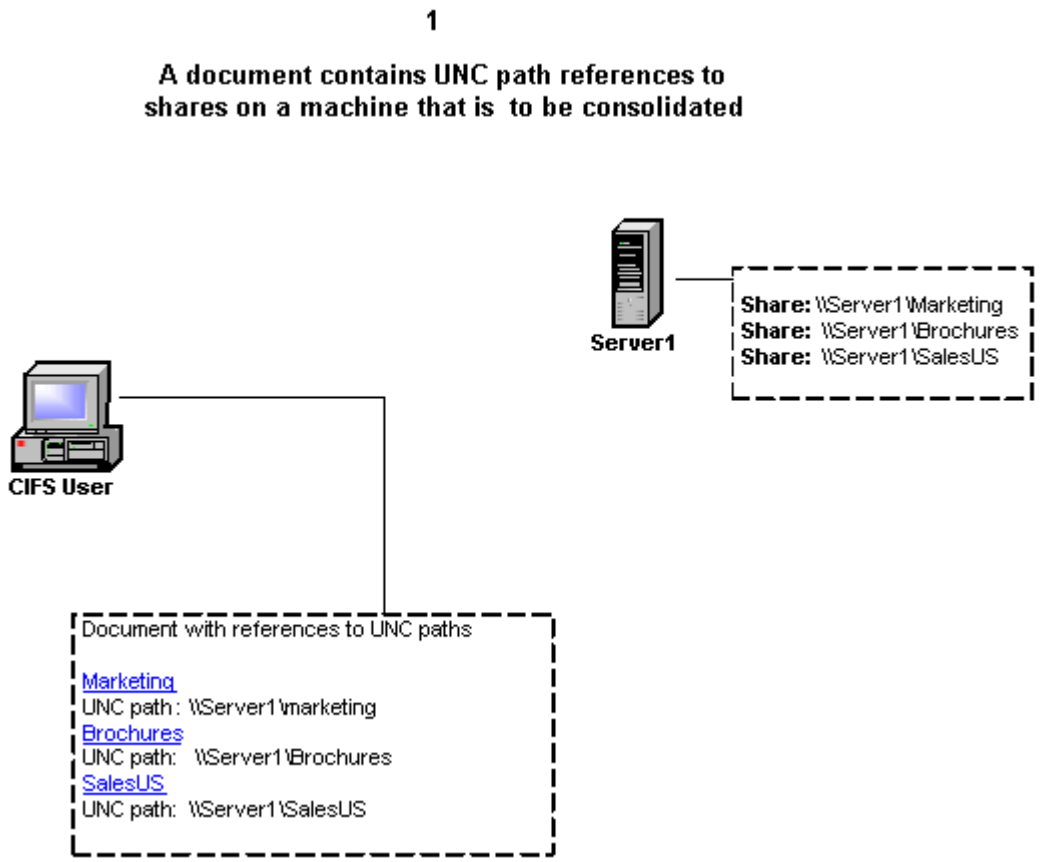


How consolidation DFS roots work

The following diagrams illustrate how consolidation DFS roots enable you to migrate data without affecting UNC path references embedded in user documents.

When to use a consolidation root

You might want to configure a consolidation root when you need to move data from a server that contains files that are referenced in users' documents. When the files are moved to the new location all UNC path references to the files on the old server must be updated to point to the new location. A consolidation root enables you to move the referenced files without having to update UNC path references.

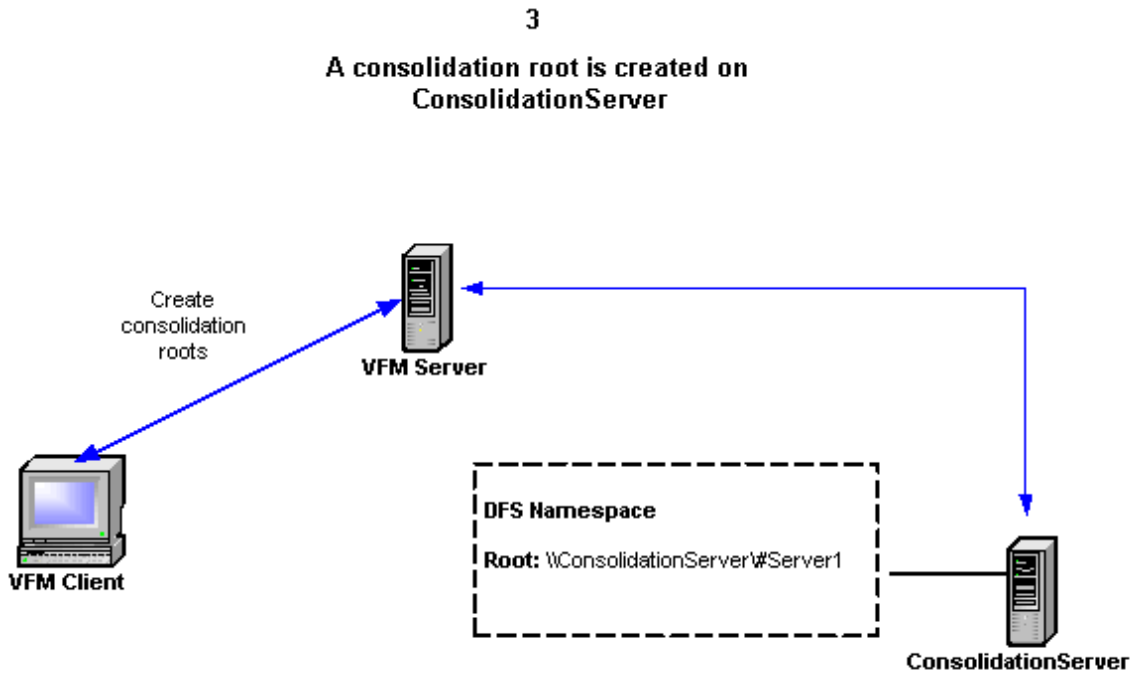


Rename the server you want to consolidate

Before you configure a consolidation root, rename the server you want to consolidate.

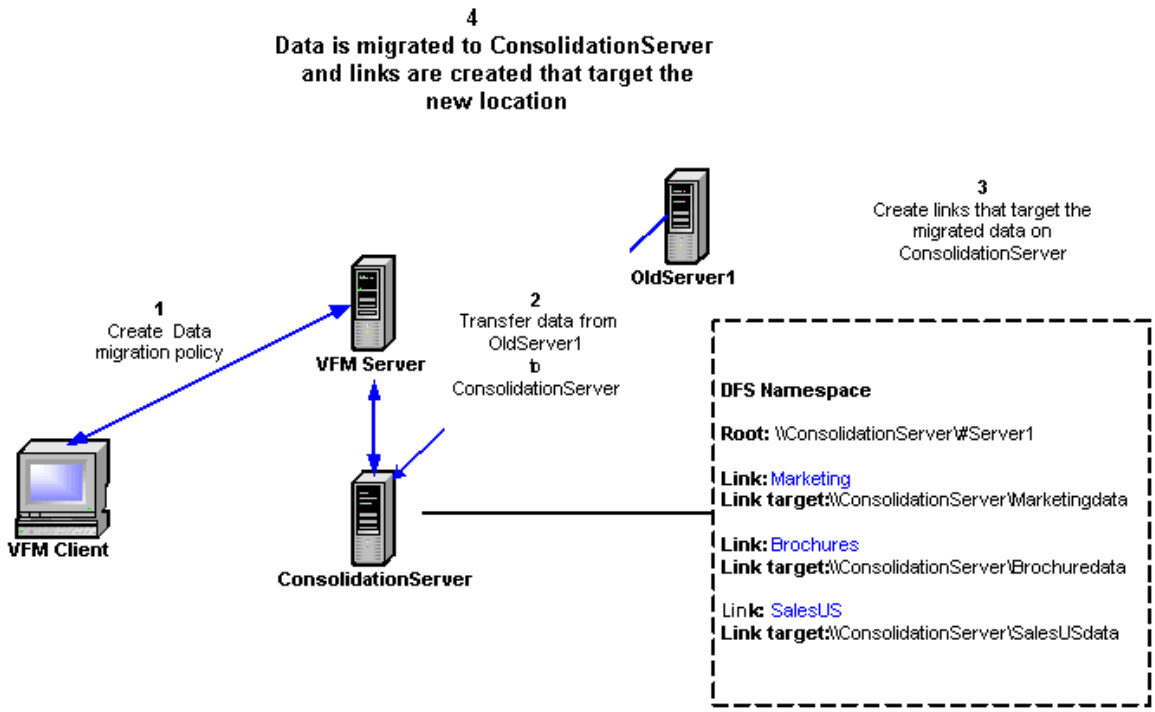
Create a consolidation DFS root

VFM provides a wizard that steps you through the process of creating a consolidation root. There are other steps you must perform when configuring a consolidation root. For example, you must install a Microsoft software update on the machine that will host the root. See "Create a consolidation root" for detailed instructions.



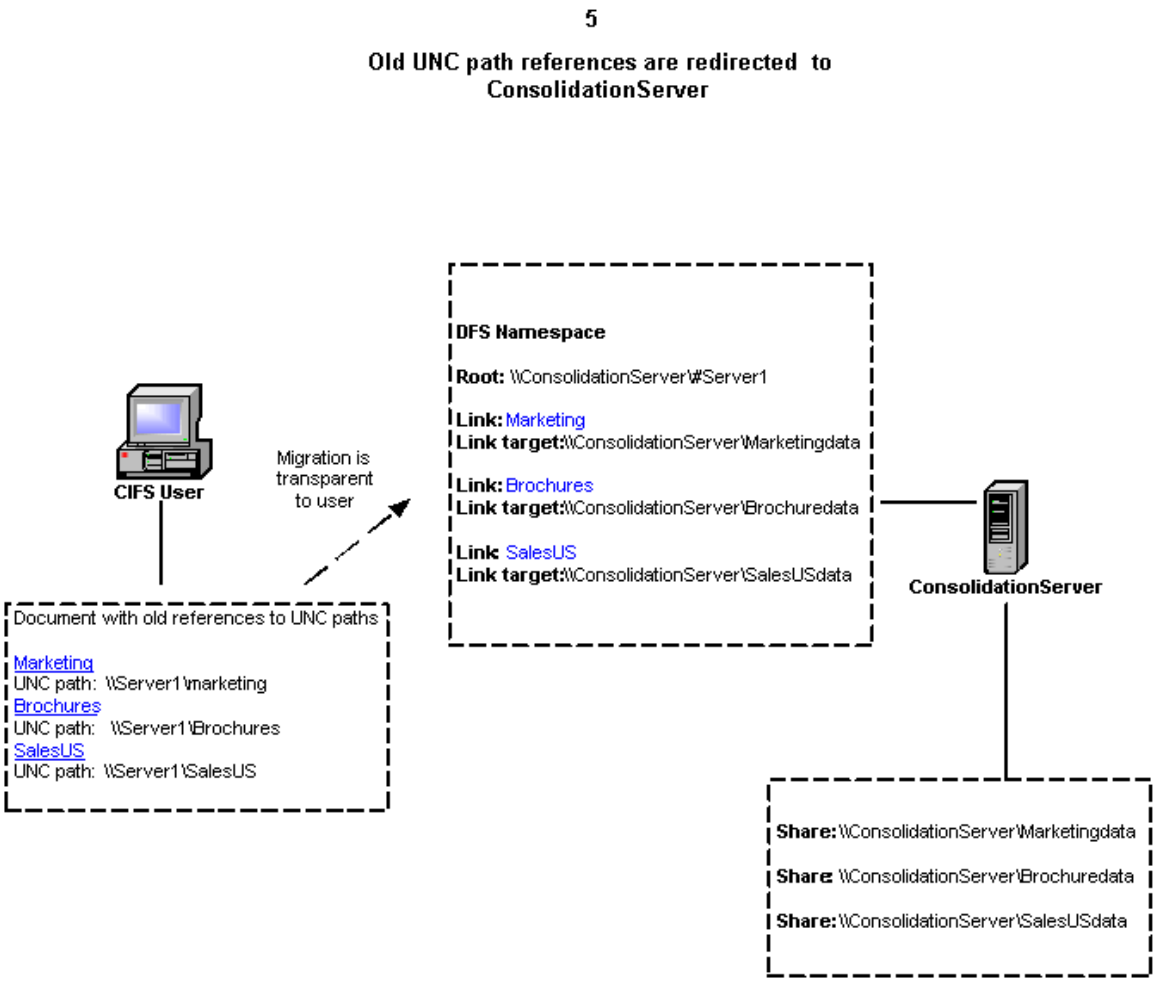
Move the data from old server location to the new location

Create a migration policy to move the data to the new location and create links to shares in the new location.



Old UNC path references are redirected

The old UNC path references to shares in the old server are redirected to the new location of the shares.



Display an existing DFS root

Display DFS roots that already exist on your network.

1. Perform one of the following actions:
   - Right-click Logical View on the tree and click **Display an existing DFS root**.
   - Click **Display an existing DFS root** on the toolbar.
   - On the **Tools** menu, click **Display an existing DFS root**.
2. Perform one of the following actions:
   - Type the name of the DFS root, its host server, or domain name.

- Select the domain that contains the DFS root, and then select the root. If a server is configured so that it does not appear in a browser, it does not appear in this list. You can still display the server in the Logical View tree by typing the name of the root or server in the **DFS Root**, **Host Server**, or **Domain field**.

3. Click **OK**.

Note: To view all the roots in the namespace, click **Logical View** on the DFS tree.

Monitor DFS root status

By default, VFM monitors DFS roots and links. You can turn off status monitoring for a root.

1. Perform one of the following actions:
   - Click the root. On the **Properties** tab that appears in the right pane, click Edit.
   - Right-click the root and click **Properties**.
2. Click the **Status Monitoring** tab, and thenclear the **Monitor status every** check box.

Set permissions on a domain root

Set or change permissions for a domain-based DFS root.

1. Right-click the root and click **Properties**.
2. Click the **Security** tab.

Modify properties of a DFS root

Edit the properties of a DFS root displayed in the Logical View tree.

1. Perform one of the following actions:
   - Click the DFS root to display the **Properties** tab in the right pane, and then click Edit.
   - Right-click the DFS root and click **Properties**.
2. Update the information and click **OK**.

View attributes of a DFS root

Click a DFS root to display the following tabs in the right pane.

- **Properties** - Shows the characteristics or parameters of the selected root and enables you to edit certain fields. Right-click an item to display a context menu.
- **Status** - Shows information for any monitored item (for example, root, link, and target). By default, VFM monitors roots and links. You can choose to enable monitoring of targets. Right-click a root and click **Properties**, and then click the

Status Monitoring tab.

- **Replication Tasks** - Shows information about replication operations for items forming part of the root.
- **Explorer** - Shows the namespace, as a user browsing with Windows Explorer would see it. Right-click a root share, a single target link, or replicated link to display a context menu.
- **Dependencies** - Shows the underlying resources, such as systems, shares, and disks, forming part of the root. Right-click an item to display a context menu.
- **Events** - Shows the history of events for the item selected.
- **Reports** - Shows a list of reports generated that reference the root.

Back up a DFS root

VFM enables you to manually back up the logical structure of a DFS root.

1. Perform one of the following actions:
   - Right-click a root and click **Backup**.
   - Right-click Logical View and click **Backup**.
   - On the **Tools** menu, click **Manual backup**.
2. Select the DFS roots you want to back up.
3. Accept the default name for the backup file or type a new name.
4. Click **Backup**.
5. Click **OK**. The backup file is saved on the VFM server.

Notes:

- To check whether the backup operation is complete, click the **Events** tab for each root that was backed up.
- VFM enables you to set up a policy to automatically back up selected DFS roots. On the **Tools** menu, click **New Policy**, point to **Namespace Policy**, and then click **Backup Policy**.

Refresh a DFS root

Update the contents of a DFS root in the Logical View tree.

Perform one of the following actions:

- Select the root and press **F5**.
- Select the root and click **Refresh** on the main toolbar.
- Right-click the root and click **Refresh**.
- Select the root and click **Refresh** on the **View** menu.

Fresh information is gathered from the network for all the items that make up the DFS root.

Notes:

- Gathering fresh information for the entire DFS root takes extra time if the DFS root is large.
- To refresh all the items in the namespace, click **Refresh All** on the **View** menu.

Check status of a DFS root

If needed, you can manually check the status of a DFS root to ensure that the root is still valid.

Right-click the DFS root and click **Check status**.

Note: To remove the status display from a root, right-click the root and click **Clear status**.

Remove a DFS root from display

If your DFS tree has too many roots to manage effectively, or if you completed the management of a root, you can remove the DFS root from appearing in the VFM console. This does not delete the DFS root from the server.

Right-click the DFS root and click **Remove from display**.

Delete a DFS root

When you delete a DFS root, it is removed from the server. The DFS logical structure is removed, but files that were referenced by the DFS root are not deleted. When you delete a root, the clients can no longer browse it using the namespace.

1. Right-click the DFS root and click **Delete**.
2. Click **Yes**.

Note: You must create and delete DFS roots hosted on NT4 systems through the Windows Control Panel.

Create a root replica

Specify additional servers to host copies of the logical structure of a namespace to provide fault tolerance and load balancing. You can only create a root replica for a domain-based DFS root.

1. Perform one of the following actions:
   - Right-click the root and click **Add replica**.
   - Click Logical View in the DFS tree to display a Properties tab. Right-click a root and click **Add replica**.
2. Type the name of the server hosting the root replica, or click **Browse** to find the server.

3. Click **Next**.
4. Perform one of the following actions:
   - Select **Use an existing share** and select a shared folder from the list.
   - Select **Create a new share** and type a path and name for a shared folder. The application creates the shared folder on the server specified.
5. Click **Finish**. The root is now represented in the Logical View as a replicated root .

Notes:

- You can create only one DFS root or replica per Windows 2000 server. Windows Server 2003, Enterprise Edition, can host multiple DFS roots.
- When creating or selecting a share, best practices dictate that the share name match the name of the root.
- To provide fault tolerance and load balancing of stand-alone roots, create a namespace availability policy.

View the replicas of a root

Display a list of replicas for a domain-based DFS root.

1. Click the DFS root in the Logical View tree.
2. Click the **Properties** tab that appears in the right pane. The replicas of the root appear under **Replicas**.

Notes:

- Right-click a replica to display a context menu.
- Double-click a replica to display where it is physically located on your network. The Physical View tree expands to display the machine where the replica resides.

View contents of a root replica

View the contents of domain-based root replicas. To browse the contents of a replica, you must make it the active target.

1. In the Logical View tree, select a domain-based root replica.
2. Click the **Explorer** tab in the right pane.
3. Right-click a domain-based root replica , point to **Target,** and click the replica you want to activate. The contents of the replica appear in the right window.

Notes:

- You can also view the contents of a link, share, or folder. In the Logical View tree or Physical View tree, right-click an item, point to **External Tools**, and click **Explorer**.
- Changing the active target only changes the target the VFM console machine is viewing. This does not change what other users of the namespace see.

Compare contents of a root replica

Quickly compare the contents of a domain-based root replica.

1. Click a root under the Logical View to display its properties in the right pane.
2. Under **Replicas**, select the replicas that you want to compare.
3. Right-click, point to **Reports**, point to **Physical**, and click **File Differences**. The first replica on the list that you selected appears in the **Compare** field.
4. Click **Next**.
5. Type a name for the report and location where you want to save it.
6. Click **Finish**.

Note: You can also compare contents of shares in the Physical View. Right-click a share, point to **Reports,** and click **File Differences**.

Delete a root replica

Delete a domain-based root replica.

1. Select a root in the Logical View. A **Properties** tab appears in the right pane.
2. Under **Replicas**, right-click a shared folder and click **Delete**.

Note: If both root replicas are deleted, the root is deleted.

DFS links

The next step in creating a namespace is to create links. Links form a connection to one or more shared folders, other DFS links, or to another DFS root. This section provides instructions about how to create and manage links and link targets.

Note: The Namespace Creation Policy and Permission Based Policy wizards enable you to add multiple links and folders at a time. Use these methods when you want to add links to multiple shares that are supported by different machines and when you want to keep the logical namespace aligned with subsequent changes in the underlying physical resources.

Add a DFS link

Add links to the logical namespace by any one of the following operations.

- Drag a share from Windows Explorer to a DFS root in the Logical View tree
- Drag an item from the Physical View tree to a DFS root in the Logical View tree
- Use the Add link dialog box to perform the following tasks:
    - To make a shared folder or subfolder the target of a link
    - To add a link to a logical folder in the namespace
    - To add a link to multiple logical folders in the namespace
    - To add a link to multiple roots

A link can stand alone in the DFS tree or links can be grouped into folders. The target of a DFS link must be one of the following types:

- 1 to N shared folders
- 1 to N stand-alone DFS paths
- Only 1 domain-based DFS path

Configuring other combinations of link targets might prevent link target failover from functioning correctly.

To drag a share from Windows Explorer to a DFS root in the Logical View tree:

Drag a network share (UNC path) from Windows Explorer to a DFS root in the Logical View tree.

Notes:

- You cannot drag local folders (for example, c:\<*path*>) to a DFS root from Windows Explorer.
- If you want to drag shares from your local system into the DFS namespace, browse Windows Explorer to your local host through the Network Neighborhood so that Explorer displays a UNC path name to your local share before performing the drag-and-drop operation.

To drag an item from the Physical View tree to the Logical View tree:

Drag a shared folder from the Physical View tree to a DFS root in the Logical View tree.

To make a shared folder or subfolder the target of a link:

1. Perform one of the following actions:
    - Select a root in the Logical View tree and click **Add link**.
    - Right-click a DFS root in the Logical View tree and click **Add link**.
    - Right-click a DFS root on the **Properties** tab of Logical View and click **Add link**.

- Select a DFS root in the Logical View tree and click **Add link** on the **Tools** menu.
- Drag a network share (UNC path) to the Logical View.

2. Under **Users connect to**, type the name of the link.
3. Click **Add**.
4. Under **Send the user to one of these shared folders or directories**, perform one of the following actions:
   - Type the name of a folder.
   - Click **Browse** to find a share or subfolder in your network or the Physical View tree.
   - Drag a network share and drop it into the **Send the user to one of these shared folders or directories** field.
5. Click **OK**.
6. In the **Comment** field, optionally type a word or phrase that describes the DFS link.
7. In the **Clients cache this link for** field, optionally type how long (in seconds) a reference to the DFS link is cached on the DFS client.
8. Click **OK**. The DFS link appears under the root selected.

To add a link to a folder:

Group links in logical folders. Create a folder on a DFS root server and add links to it.

1. Perform one of the following actions:
   - Select a root in the Logical View tree and click **Add link**.
   - Right-click a DFS root in the Logical View tree and click **Add link**.
   - Right-click a DFS root on the Properties tab of Logical View and click **Add link**.
   - Select a root in the Logical View tree and click **Add link** on the **Tools** menu.
2. Under **Users connect to**, type a name for the folder and the name of the link; for example: *foldername\linkname* or *folder1\folder2\linkname.*
3. Click **Add**.
4. Under **Send the user to one of these shared folders or directories**, type the name of a folder, or click **Browse** to find a share or subfolder in your network or the Physical View tree.
5. Click **OK**.
6. In the **Comment** field, optionally type a word or phrase that describes the DFS link.
7. In the **Clients cache this link for** field, optionally type how long (in seconds) a reference to the DFS link is cached on the DFS client.
8. Click **OK**. The folder appears under the DFS root selected.

To add a link to multiple folders:

Add the same link to multiple folders in the Logical View.

1. Select a folder with subfolders to display a Properties tab in the right pane.
2. On the Properties tab, right-click the selected subfolders and click **Add links**.
3. Under **Users connect to**, type the name of the link.
4. Click **Add**.
5. Under **Send the user to one of these shared folders or directories**, perform one of the following actions:
   - Type the name of a share.
   - Click **Browse** to find a share or subfolder in your network or the Physical View tree.
   - Drag a network share and drop it into the **Send the user to one of these shared folders or directories** field.
6. Click **OK**.
7. In the **Comment** field, optionally type a word or phrase that describes the DFS link.
8. In the **Clients cache this link for** field, optionally type how long (in seconds) a reference to the DFS link is cached on the DFS client.
9. Click **OK**. The DFS link appears under the folders selected.

To add a link to multiple roots:

Add the same link to multiple roots in your namespace.

1. Select **Logical View** Logical View to display a Properties tab in the right pane.
2. On the Properties tab, right-click the selected roots and click **Add links**.
3. Under **Users connect to**, type the name of the link.
4. Click **Add**.
5. Under **Send the user to one of these shared folders or directories**, perform one of the following actions:
   - Type the name of a share.
   - Click **Browse** to find a share or subfolder in your network or the Physical View tree.
   - Drag a network share and drop it into the **Send the user to one of these shared folders or directories** field.
6. Click **OK**.
7. In the **Comment** field, optionally type a word or phrase that describes the DFS link.
8. In the **Clients cache this link for** field, optionally type how long (in seconds) a reference to the DFS link is cached on the DFS client.
9. Click **OK**. The DFS link appears under the roots selected.

Notes:

- Windows NT 4 DFS roots do not support changing the cache time-out.
- To display hidden shared folders, select the **Show hidden shares** check box.
- By default, VFM only displays server machines. To also display workstations, select **Show workstation computers**.
- The following reserved device names cannot be used as the name of a link: CON, PRN, AUX, CLOCK$, NUL, COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, and LPT9.

Add multiple links

VFM makes it easy for you to visualize the namespace you are designing. VFM displays the namespace as you build it. The Logical View tree is updated as you add a link or logical folder.

Note: Device names cannot be used as the name of a link. See "Add a DFS link" for detailed information.

To add multiple links:

Add multiple links to the DFS root selected or to an existing folder in the namespace.

1. Perform one of the following actions:
   - Right-click a DFS root in the Logical View and click **Add multiple links**.
   - Right-click a DFS root on the Properties tab of Logical View and click **Add multiple links**.
   - Select the root and click **Add multiple links** on the **Tools** menu.
2. To add links, perform one of the following actions:
   - Drag network shares (UNC paths) from Windows Explorer to the tree view in the Add Multiple Links dialog box.
   - Select the DFS root or a folder and click **Add Links**.
   - Right-click the DFS root or folder and click **Add links**.

   A dialog box appears, enabling you to browse your network or Physical View tree.
3. Expand the tree you want to search and select an item or items.

   Notes:

   - To display hidden shared folders, select the **Show hidden shares** check box.
   - By default, VFM only displays server machines. To also display workstations, select **Show workstation computers**.
   - To view a context menu, right-click a shared folder.

4. Click **OK**. The links you created appear in bold print in the namespace tree.
5. Repeat Steps 2 through 4 to create additional links.
6. Click a link to display its properties.
7. Optionally update the link properties

- **Name** - Type a new name for the link.
- **Send the user to this shared folder or directory** - Change the target of the link. Type the address of a new target or click **Browse** to locate another target.
- **Comment** - Add a description of the link.
- **Clients cache this link for** - Set the duration (in seconds) the target of the link is cached on a DFS client. Windows NT 4 DFS roots do not support changing the cache time-out.

8. Click **OK** to apply the changes to the namespace. A status window displays the changes being made.
9. Click **Done**.

To add multiple links to a folder:

Create folders to group links in a common directory in the Logical View. You can also create a folder when you add a link in the "Add a link" dialog box.

1. Select the DFS root or a folder in the namespace of the Add Multiple Links dialog box.
2. Click **New Folder**.
3. Type a name for the folder and press **Enter**.
4. Perform one of the following actions to add links to the folder:
   - Select the folder and click **Add Links**.
   - Right-click the folder and click **Add Links**.
   - Drag network shares from Windows Explorer.
   - Cut and paste mapped network drives or items with valid UNC paths to the folder from Windows Explorer.

Notes:

- You cannot drag or paste local folders from Windows Explorer.
- If you want to drag shares from your local system into the DFS namespace, browse Windows Explorer to your local host through the Network Neighborhood so that Explorer displays a UNC path name to your local share before performing the drag-and-drop operation.

To move a link or folder to a new location:

After a link or folder is added to the namespace of the Add Multiple Links dialog box, you can move the item to a new location in the tree.

Perform one of the following actions:

- Drag the link or folder to a new location on the tree.
- Right-click the link or folder you want to move and click **Cut**. Right-click the link or folder where you want to move the item and click **Paste**.

Create new shared folders to link

Select the machine or machines where you want to create shares and add the shares to a new or existing link.

1. Perform one of the following actions:
   - On the **Tools** menu, click **Create shares**.
   - Right-click a link in the Logical View and click **Create shares**.
   - Right-click a machine in the Physical View tree and click **Create shares**.
2. Click **Next**.
3. Select **Regular Share** and click **Next**.
4. Type the information requested and click **Next**.
5. Select the machine or machines where you want to create the folder and click **Next**.
6. Select an option and click **Next**.
7. Perform one of the following actions:
   - If the path of the link appears, click **Next**.
   - If the path of the link does not appear, type the path or click **Browse** to locate the link in the namespace, and then click **Next**.
8. Click **Finish**. The share is created on the machines and added to the link.

Expand a link

VFM enables you to replace a link targeting a share with links targeting the subdirectories contained in the original share. When the share contains data in its root, you can migrate the data and create a link to target the data. This enables you to access the data through the namespace.

Expand a link option enables you to perform the following:

- Move data in subdirectories to a different machine to load balance.
- Make the data in subdirectories available from different locations in the namespace.

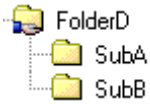
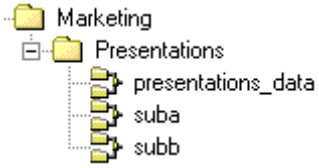
Note: When expanding namespaces, the DFS limitations on numbers of links contained in a root need to be considered. See "Basic DFS requirements and limitations" for detailed information.

1. Right-click a link whose target contains subdirectories and click **Expand**.
2. If the same link appears in other locations of the namespace, a list of identical links appears. VFM enables you to expand all, none, or some of the identical links. After you make your choice, click **OK**.
3. VFM identifies the subdirectories and explains what actions will be performed. Click **Yes**.
4. Click **Done**. VFM deletes the original link, creates a logical folder with the same name as the original link, and adds new links to the logical folder that target the subdirectories.
5. If the original target contains data along with subfolders, VFM provides the option to

migrate the data to another location to make the data accessible through the namespace. To migrate the data, click **Yes** when the dialog box appears.

6. Perform one of the following actions:
   - Select an existing migration policy.
   - Click **New Policy** to create a new migration policy.
     - Type the name for the policy.
     - Click **OK**.
     - Select the new policy.
7. Click **Next**. The original and destination paths appear.
8. Click **Next**.
9. Click **Finish**. A link targeting the data appears under the same folder as the links targeting the subdirectories. The link name ends with "_data." Example

   The expand feature is illustrated below.

Namespace	**Windows Explorer**
1. A "Marketing" folder in the namespace contains a "Presentations" link. 	2. The "Presentations" link references a share with two subfolders and files in its root. You want the subfolders and files from the original link target directory referenced by links. 
3. After executing the expand command, a "Presentations" folder appears under "Marketing" with three links. The "presentations_data" link targets a new subfolder containing the files from the original link target directory.  	

Add a logical folder to the namespace

VFM enables you to create folders in your namespace. The folders appear alphabetically in the Logical View tree. You can add links to the folders and move the folders and their links to another folder or DFS root.

1. Perform one of the following actions:
    - Right-click a DFS root or folder in the Logical View and click **Add folder**.
    - Select a DFS root to display a Properties tab in the right pane. Right-click anywhere on the page and click **Add folder**.
2. Type a name for the folder and click **OK**.

Notes:

- The permissions on a DFS root share controls whether you can create logical folders in the namespace. Windows Server 2003 defaults share permissions to read-only and Windows 2000 Server defaults share permissions to allow everyone full access.
- A folder and its links can be moved to another folder or DFS root. Drag the folder to its new location.
- Dragging a folder moves only its logical structure but does not move data physically resident in the folder on the DFS root server. Best practices dictate that data should not reside physically on the DFS root server because this can increase the load on the server by forcing it to serve files as well as the logical namespace. If you have data in folders in your DFS namespace, use the VFM migration features to move it to the new location where you transferred the folder.
- To create a subfolder, right-click the newly created folder and click **Add folder**.
- To add links to the folder, right-click the folder and click **Add link** or **Add multiple links**. You can also drag links to the folder.

Rename a DFS link or folder

To change the name of a link or folder in the Logical View tree perform one of the following actions:

- Click a link or logical folder slowly to display a text box and type a new name.
- Right-click the link or folder and click **Properties**, type a new name, and click **OK**.
- Click the link to display a **Properties** tab in the right pane and click Edit. Type a new name and click **OK**.

Notes:

- If the namespace contains links that are identical to the link you renamed, VFM provides the option of renaming all the identical links in one easy step.
- Device names cannot be used as the name of a link. See "Add a DFS link" for detailed information.

Monitor DFS links

To get status monitoring information about links, you must go through the DFS root that contains the links. If status monitoring is turned on for a DFS root, you can also turn on status monitoring for its links.

1. Perform one of the following actions:
    - Right-click the root that contains the links you want to monitor and click **Properties**.
    - Click the root to display the **Properties** tab in the right pane and click Edit.
2. Click the **Status Monitoring** tab and select **Monitor links every**.
3. Enter how often (in minutes) you want VFM to check the status of each link when it is online.
4. Enter how often (in minutes) you want VFM to check the status of each link when it is offline.

View attributes of a DFS link

Select a DFS link to display the following tabs in the right pane.

- **Properties -** Shows the characteristics or parameters of the selected link and enables you to edit certain fields. Right-click an item to display a context menu.
- **Status -** Shows information about the link. This tab also shows information about targets when target monitoring is turned on. By default, VFM monitors roots and links. To enable monitoring of targets, edit the properties of the DFS root to which the link belongs.
- **Replication Tasks -** Shows information about link target replication operations.
- **Explorer -** Shows the namespace, as a user browsing with Windows Explorer would see it. Right-click a root share, a single target link, or a replicated link to view a context menu.
- **Dependencies -** Shows the underlying resources, such as systems, shares, and disks that form part of the link. Right-click an item on the tab to display a context menu.
- **Events -** Shows the history of events for the item selected.
- **Reports -** Shows a list of reports generated that reference the link and the targets of the link.

Modify properties of a DFS link

Edit the properties of a DFS link in the Logical View tree.

1. Perform one of the following actions:
   - On the **Properties** tab of a link, click Edit.
   - Right-click the DFS link and click **Properties**.

   Notes:
   - When you browse for a folder, you have the option of creating, renaming, deleting, and sharing new folders, and removing a share.
   - Right-click a shared folder to view a context menu.
   - Double-click a shared folder and right-click a folder or anywhere in the window to view a context menu.
   - When the cache period elapses, the DFS client must access the root share to update the shared folder information. Entering a lower value increases associated network traffic. A higher value reduces associated network traffic at the possible expense of updated share information.
   - If the cache time-out value is set too high, client computers might not pick up changes to DFS referrals unless they are restarted (see Microsoft Knowledge base article Q222604).
   - Windows NT 4 DFS roots do not support changing the cache time-out.

2. Update the information and click **OK**. If the namespace contains links that are identical to the link you modified, VFM provides the option of updating all the identical links in one easy step.

Refresh a DFS link

Update the contents of a DFS link in the Logical View tree. Fresh information is gathered from the network for all the targets of the DFS link.

Perform one of the following actions:

- Select the link and press **F5**.
- Select the link and click **Refresh** on the main toolbar.
- Right-click the link and click **Refresh**.
- Select the link and click **Refresh** on the **View** menu.

Note: To refresh all the items in the namespace, click **Refresh All** on the **View** menu.

Check the status of a DFS link

If needed, you can manually check the status of a DFS link to ensure that it is still valid.

Right-click the DFS link and click **Check status**.

Notes:

- To remove the status display from a link, right-click the link, and click **Clear status**.
- If VFM is actively monitoring the status of a link or its targets, clearing status only takes effect after VFM finishes checking status for the link.

Delete a DFS link

When you delete a DFS link, the DFS logical structure is removed but the targets of the DFS link are not deleted.

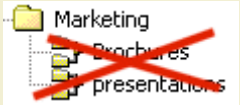
1. Perform one of the following actions:
    - Select the DFS link and click **Delete** on the main toolbar.
    - Right-click the link and click **Delete**.
2. Click **Yes**.

Notes:

- Links contained in any of the Admin policies must be removed from the policy before they can be deleted from the root.
- When a root runs on Microsoft Windows Server 2003 and you delete all the links under a logical folder, the logical folder is also removed. In Windows 2000, logical folders are not removed. This is a Microsoft Windows behavior. The following example illustrates this behavior.
    - The logical folder *Marketing* contains two links.

    - <u>DFS root on Windows Server 2003.</u> When links *Brochures* and *presentations* are deleted, the logical folder *Marketing* is also deleted.

    - <u>DFS root on Window 2000</u>. When links *Brochures* and *presentations* are deleted, the logical folder *Marketing* is not deleted.



View the target of a link

To display the target or targets (replicas) of a link:

1. Click the link in the Logical View tree.
2. Click the **Properties** tab in the right pane.

Notes:

- Right-click a target to display a context menu.
- Double-click a target to display where it is physically located on your network. The Physical View tree expands to display the machine where the target resides.
- Targets that are members of a client disaster recovery policy have radio buttons instead of check boxes next to them because only one target can be online. Replication status information appears to the right of each target in addition to the storage status information available for all targets.

Change storage status of a link target

- A link target on DFS roots hosted on Windows 2000 or Windows Server 2003 can be taken offline. The action does not remove the target from the link. The target is temporarily unavailable to DFS clients (not included in referrals to the DFS client).
- Links with replicated targets that are members of disaster recovery policies can only have one target online. Targets of those links appear in VFM with radio buttons.
- Referrals for the link do not contain information about the offline target, although clients already accessing the target continue to do so until they request a fresh referral.

  - To take a link target offline
  - To put a link target online
  - To change storage status for all or selected targets

To take a link target offline:

1. Click the link that references the shared folder to display the **Properties** tab in the right pane.
2. Under **Targets** on the **Properties** tab, perform one of the following actions:
   - Clear the check box next to a target.
   - Select a radio button next to a target to take the online target offline. Targets that are members of a client disaster recovery policy have radio buttons instead of check boxes because only one target can be online. When you select a target you perform a manual failover, the selected target becomes the active target.
   - Right-click the folder and click **Toggle Storage Offline/Online**.

Notes:

- The offline status indicator appears on the folder.
- Link targets on DFS roots hosted on Windows NT 4 systems do not support being taken offline.

To put a link target online:

1. Click the link that references the shared folder. A **Properties** tab appears in the right pane.
2. Under **Targets** on the **Properties** tab, perform one of the following actions:
    - Select the check box or radio button next to a target. Targets that are members of a client disaster recovery policy have radio buttons instead of check boxes because only one target can be online. When you select a target, you perform a manual failover. The selected target becomes the active target.
    - Right-click the offline folder and click **Toggle Storage Offline/Online**.

To change the storage status of all or selected targets:

Quickly change the storage status of all or selected targets in a folder or root.

1. Click a root or folder in the Logical View tree to display the **Properties** tab in the right pane.
2. Under **Links**, select the links of the targets you want to change.
3. Right-click and click **Toggle all targets online** or **Toggle all targets offline**.

Monitor link targets

If status monitoring is turned on for DFS links, you can turn on status monitoring for the targets of the links. Monitoring link targets provides additional information about the "health" of your DFS configuration by checking whether the targets of links are available.

1. Perform one of the following actions:
    - Right-click the root and click **Properties**
    - Click the root to display the **Properties** tab and click Edit.
2. Click the **Status Monitoring** tab and select **Monitor targets every**.
3. Enter how often (in minutes) you want VFM to check the status of each target when it is online.
4. Enter how often (in minutes) you want VFM to check the status of each target when it is offline.

Refresh a shared folder

You can update the information about a shared folder.

Notes:

- To refresh the information about all the items in both the Logical View and Physical View, click **Refresh all** on the **View** menu.
- To refresh the information about all the items in the logical or physical views, right-click Logical View or Physical View in the tree and click **Refresh**.

Perform one of the following actions:

- Right-click a shared folder and click **Refresh**.
- Select a shared folder and press **F5**.
- Select a shared folder and click **Refresh** on the main toolbar.
- Select a shared folder and click **Refresh** on the **View** menu.

Check status of a link target

If needed, you can manually check the status of a link target to ensure that it is still valid.

1. In the Logical View tree, click the link that references the shared folder to display the **Properties** tab in the right pane.
2. Under **Targets** on the **Properties** tab, right-click the target and click **Check status**.

Note: To remove the status display from a link target, right-click the target and click **Clear status**.

View size of data in the namespace

VFM enables you to view the size and amount of space used by data in the namespace.

Perform one of the following actions:

- Right-click a root, link, or logical folder in the Logical View and click **Properties**.
- Right-click a share or directory in the Physical View and click **Properties**.

VFM displays the size of the information contained in that portion of the logical namespace, along with the number of files, folders, and links when it is applicable.

Delete a target

When you delete a target, it is only removed from the logical structure or namespace. The target is not deleted from the machine where it resides.

1. In the Logical View tree, click the link that references the shared folder to display the **Properties** tab in the right pane.

2. Under **Targets** on the **Properties** tab, right-click the target and click **Delete**.
3. Click **Yes**.

Add an existing shared folder as a replica

Add multiple copies of a shared folder to a DFS link. This provides fault tolerance and load balancing to control network traffic at the share level. The target of a link must be one of the following types:

- 1 to N shared folders
- 1 to N stand-alone DFS paths
- Only 1 domain-based DFS path

Note: Configuring other combinations of link targets might prevent link target failover from functioning correctly.

1. Right-click a link and click **Add replica**.
2. Under **Send the user to one of these share folders or directories**, perform one of the following actions:
   - Type the address of a folder.
   - Click **Browse** to find a folder on the network. A list of available domains appears.
     - Expand the tree for the domain or click the domain.
     - Double-click a machine to display a list of shared folders.
     - Click **OK**.
3. To add another replica, click **Add** and repeat Step 2.
4. Click **OK**.

Notes:

- VFM synchronizes the contents of a shared folder replica set only if it is a member of a disaster recovery or replication policy.
- For shared folder replica sets that are not members of a disaster recovery or replication policy, you must either rely on other mechanisms when possible or manually ensure that the contents of the shared folders stay synchronized.
- Use the **Ctrl** or **Shift** key to select multiple link targets at one time.

View targets replicated with FRS

Check the File Replication Service (FRS) status of the targets of a domain-based DFS root.

1. Click the root or link to display the **Properties** tab in the right pane.
2. VFM returns one of the following values for **FRS Replication**:
   - **Unknown** - Status monitoring is not turned on for the root or VFM has not checked status.
   - **On** - All the targets for the root have FRS replication turned on.
   - **Off** - FRS replication is not turned on for the root.
   - **Partial** - Only some of the targets of the root have FRS replication turned on. (DFS roots or DFS links only)

Note: VFM replication does not rely on FRS.

View contents of a link replica

View the contents of DFS link replicas. To browse the contents of a replica, you must make it the active target.

1. In the Logical View tree, click a DFS link with replicas.
2. Click the **Explorer** tab in the right pane.
3. Right-click a DFS link replica, point to **Target,** and click the replica you want to activate. The contents of the replica appear in the right window.

Notes:

- You can also view the contents of a link, share, or folder. In the Logical View tree or Physical View tree, right-click an item, point to **External Tools**, and click **Explorer**.
- Changing the active target only changes the target the VFM console machine is viewing. It does not change what other users of the namespace see.

Compare contents of a link replica

Quickly compare the contents of the targets of a DFS link.

1. Click a link under the Logical View to display its properties in the right pane.
2. Under **Targets**, select the targets you want to compare.
3. Right-click, point to **Reports**, point to **Physical**, and click **File Differences**. The first target on the list that you selected appears in the **Compare** field.
4. Click **Next**.
5. Type a name for the report and the location where you want to save it.
6. Click **Finish**.

Note: You can also compare contents of shares in the Physical View. Right-click a share, point to **Reports**, and click **File Differences**.

Delete a replica

Remove a DFS shared folder replica from the namespace.

1. In the Logical View tree, click the link that references the replica. A **Properties** tab appears in the right pane.
2. Under **Targets** on the **Properties** tab, right-click the replica and click **Delete**.
3. Click **Yes**.

Note: The shared folder replica is not deleted from the system. It is only removed from the namespace.

Status monitoring

VFM enables you to monitor the status of DFS roots, links and targets.

- VFM automatically monitors the status of DFS roots and the links the roots contain.
- You can control whether and how frequently VFM checks the status of items in the namespace.
- Monitoring the status of link targets is optional.
- When links and shares are monitored, the status report for a DFS root includes information about all the items that make up the root. For example, a root with unavailable targets has a status report that includes a list of the targets and their status.
- Links in a client disaster recovery policy show "unknown" status until monitoring has run at least once for the policy. Monitoring is necessary to perform failover of links that participate in disaster recovery policies.
- On the **Status** tab of a DFS root, right-click an item to view menu options.
- Monitoring DFS resources generates network traffic between the VFM components and the resources being monitored. Slower polling rates generate less traffic but provide less timely notification of problems in the monitored namespace.

Monitoring status of data replication

- When you use VFM replication in a replication policy, replication status monitoring is available to the policy and its targets.
- Place the cursor over an item to quickly display information about the item.
- If status monitoring is turned on for the links and folders contained in a replication policy, status indicators are displayed for the items on the **Replication** tab that appears in the right pane when you select a policy.

Modify status monitoring properties

When you create a namespace, VFM automatically monitors the status of the DFS root and links contained in the root. You can control whether and how frequently VFM monitors the DFS namespace. You can also select Link targets for monitoring.

1. Right-click a DFS root and click **Properties**.
2. Click the **Status Monitoring** tab.
3. Perform one of the following actions:
    - To turn off monitoring the root, clear the **Monitor status every** check box.
    - To change how often VFM monitors the DFS root, click the arrows to change **minutes when online** and **minutes when offline**.
4. Select the **Monitor links every** check box to monitor the status of every link in the namespace. Click the arrows to change **minutes when online** and **minutes when offline**.
5. Select the **Monitor targets every** check box to monitor the status of every target in the namespace. Click the arrows to change **minutes when online** and **minutes when offline**.

Notes:

- You can also update status monitoring by clicking a DFS root to display the **Properties** tab in the right pane.
- Monitoring DFS resources generates network traffic between the VFM components and the resources being monitored. Slower polling rates generate less traffic but provide less timely notification of problems in the monitored namespace.

Chapter 3 Namespace creation policies

VFM namespace creation policies enable you to easily populate and maintain a logical namespace. You can use VFM namespace creation features interactively to perform the initial population of your namespace. After the namespace is in place, the policies can automatically run on a scheduled basis to scan for changes in the physical resources supporting the logical namespace. You can configure policies to report changes, or to update the logical namespace automatically to reflect the changes detected by the policy.

This chapter provides instructions about how to configure and manage namespace creation policies.

Planning considerations

VFM namespace creation policies and permission based namespace policies provide automated synchronization between the logical namespace and supporting physical resources. The logical namespace is automatically synchronized with changes in physical resources.

The planning considerations for namespace creation policies also apply to permission based namespace policies.

How it works

The VFM Namespace Creation wizard steps you through the process of configuring namespace creation policies. The following is an overview of how a namespace creation policy works.

- You begin by giving your policy a name and selecting whether you want the policy to automatically add links to the namespace that reference the shares that match the search criteria. You can also select whether you want the policy to automatically remove links whose shares no longer exist.
- Select or create a DFS root to contain the links that the policy adds to the namespace.
- Select the domain or servers that you want to search for shares.
- Choose the location in your logical namespace where you want the links created by the policy to be located.
- Enter the share search criteria. You can combine search criteria by separating search patterns with semicolons. The search string mkt*;sales* matches shares whose names begin with either “mkt” or “sales”.
- Set the schedule to scan periodically for shares matching the search criteria.
- When VFM finds a share matching the search criteria, it creates a link and adds it to the namespace.

If a namespace creation policy scans for shares and finds a share that is already referenced by a link in the namespace, VFM does not create a link to the share. This enables you to move links created by the policy to different locations in your logical namespace and not have them recreated in their original location when the policy runs again.

In addition to automatically adding links as part of scheduled execution of the policy, you can configure the policy to automatically delete links targeting shares that are removed from servers scanned by the policy. VFM enumerates the shares for the servers in the policy and can remove links for shares that no longer exist on the server. You can configure the policy to remove links just from the subdirectory in the logical namespace specified in the policy or remove such links located anywhere in the root.

Note: During the following conditions, namespace creation policies might interfere with one another when items are added to the namespace:

- Two or more policies are configured with selection criteria that allow search results to match more than one policy.
- Two or more policies are configured to manage the same logical folder in the namespace.
- Two or more policies are scheduled to run simultaneously.

These conditions might result in sporadic failures when one of the policies attempts to add links to the namespace. These failures are benign and can be avoided by staggering the schedule of the policies involved.

The difference between a namespace creation and a permission based namespace policy

Namespace creation and permission based policies work the same except for the following features:

- Namespace creation policies enable you to search for shares, volumes, and qtrees that match the search string, whereas permission based namespace policies enable you to search for shares that match a search string.
- The permission based namespace policies enable you to filter a search by group permissions, whereas namespace creation policies do not provide this option.

Create and manage a namespace creation policy

This section provides instructions about how to create and manage namespace creation policies.

Configure a namespace creation policy

Configure a namespace creation policy to automatically populate the logical namespace and to keep the logical namespace aligned with subsequent changes in the underlying storage resources.

1. Perform one of the following actions:
    - On the **Tools** menu, click **New Policy**, point to **Namespace Policy**, and then click **Creation Policy**.
    - Right-click the **Namespace Policies** folder in Admin View, point to **New**, and then click **Creation Policy**.

- Right-click the **Creation Policies** folder and click **New Creation Policy**.
- Right-click Admin View, click **New**, point to **Namespace Policy**, and then click **Creation Policy**.

2. Click **Next**.
3. Type a word or phrase that best describes this policy in the **Name** field.
4. Clear **Automatically modify namespace after scanning** if you do not want VFM to automatically create links for items that match the search criteria. After the policy runs, the items are listed under "New Resources" on the Properties tab that appears in the right pane when the policy is selected. You can create links for the items you want to include in the namespace.
5. Select one of the following:
   - **Search for items not already targeted from this policy's folder** when you do not want VFM to target shares, subfolders, NetApp filer volumes, or qtrees that are already targeted by links in the folder. This is the default.
   - **Search for items not already targeted from this root** when you do not want VFM to target shares, subfolders, NetApp filer volumes, or qtrees that are already targeted by links in the DFS root.
6. Select **Remove links whose shares or folders no longer exist** when you want VFM to remove links targeting shares or subdirectories when a scan detects that the items no longer exist.
7. Select **Remove links from the entire root** if the links created by the policy are listed under a folder and you want VFM to scan the entire root and remove links targeting the shares or subdirectories that no longer exist.
8. From the **Use the Monitor on** list, optionally select the machine where another monitoring agent is located.
9. Select whether you want VFM to limit the number of links that are added every time the policy runs. Accept the limit specified or change the limit. When this option is cleared, VFM adds links for all the candidates found. Microsoft recommends limits to the number of links that are added to a DFS root. See the overview for DFS for detailed information about recommended size limits.
10. Click **Next**.
11. Select an existing DFS root or click **New** to create a new DFS root to contain the links, and then click **Next**.
12. Group the links in a folder or add them under the root. Perform any of the following actions:
    - In the **Name** field, type a different name for the folder.
    - Click **New Folder** to create a new folder or subfolder.
    - Click **Delete** to remove the selected folder.
    - Click the root to add the links under the root.
13. Click **Next**.
14. Select the domain or domains that you want to search or select devices, and then click **Next**.
15. Type a word or pattern in the **Search String** field. You can use DOS wild-card characters

(* or ?) in the search string. You can use the asterisk (*) as a substitute for zero or more characters in a name and the question mark (?) as a substitute for a single character in a name. You can combine search strings by separating them with semi-colons; for example, entering mkt*;sales* finds all shares on the selected domains or servers whose names begin with either mkt or sales.

16. Select a search type.
17. If you selected "Search shares matching the search string for folders matching the following path", type a folder search string.

    Note: To search for folders, the VFM account must have "Read" and "List Folder Contents" permissions for the shares and subdirectories that match the search criteria.

18. Optionally select **Allow Partial Matches** if you want to search for partial matches. For an explanation about how partial matches works, see "Change the search type."
19. Click **Next**. A list of items that match your search string appears.
20. Clear the check box of items that you do not want to add, and then click **Next**.
21. Select a template to arrange how links appear in the namespace. VFM enables you to preview the namespace.
22. Click **Next**.
23. Rearrange the links, if desired. You can move a link or folder, add a folder, add more links, remove a link or folder from the namespace, and update the properties of a link.
24. Click **Next**.
25. Select **Use Schedule**.
26. Select how frequently you want to scan for items and click **Next**.
27. Click **Finish**. The new policy appears under the Creation Policies folder.

Notes:

- If you uninstall a monitoring agent, ensure that namespace creation policies that formerly used the uninstalled agent are reassigned to a currently available agent. Right-click a namespace creation policy and click **Properties**. On the General, tab, select a monitoring agent from the "Use this Monitor on" list.
- The Namespace Creation wizard creates links that reference volumes or qtrees regardless of their share status. Links that reference volumes or qtrees that cannot be accessed because they are not shared appear as broken links in the namespace.
- Permission based namespace policies enable you to populate the namespace based on share security permissions. See "Configure a permission based namespace policy" for detailed instructions.
- If a folder is the target of a link, VFM will not create a link to a subdirectory of the folder. For example, the folder search of a namespace creation policy resulted in the following links being created in the namespace:

  link1 targets \\server1\share1\folder1

  link2 targets \\server1\share2\folder2

  If you modify the folder search string to look for subdirectories of *folder1* and *folder2*, VFM will not create links to subdirectories that match the search criteria because *link1* and *link2* already target *folder1* and *folder2*.

Update the schedule

Make changes to the schedule of a namespace creation policy.

1. Perform one of the following actions:
   - Right-click a namespace creation policy and click **Properties**.
   - Select a namespace creation policy to show a Properties tab in the right pane, and then click Edit **Edit**.
2. Click **Schedule**.
3. Perform any of the following actions:
   - Click **Add** and configure a new schedule.
   - Select an existing schedule from the list and update it.
   - Select **Use alternate schedule when the policy fails** to attempt to run the policy at a stated frequency until the policy runs successfully.
4. Click **OK**.

Add or remove servers or domains

VFM enables you to add or remove servers and domains that a namespace creation policy scans.

1. Perform one of the following actions:
   - Right-click a namespace creation policy and click **Properties**.
   - Select a namespace creation policy to show a Properties tab in the right pane and click Edit
2. Click **Domains**.
3. Perform any of the following:
   - Click **Add** to browse for domains and servers to include in the policy.
   - To remove a server or domain from the policy, select it and click **Remove**. If a server being removed from the policy has shares being referenced by links, VFM gives you the option of removing the links from the namespace.
4. Click **OK**.

Add items to an exclusion list

Maintain an exclusion list of resources you do not want to reference from the namespace. VFM ignores the items on the exclusion list when searching for resources to add to the namespace.

1. Perform one of the following actions:
   - Right-click a namespace creation policy and click Properties.
   - Select a namespace creation policy to show a Properties tab in the right pane and click Edit.
2. Click **Target Search Ignore List**.
3. Click **Add** and select items to include in the list.

4. Click **OK**.

Note: When you create a new policy using the Namespace Creation wizard and you clear items from the search results list, VFM adds the cleared items to the Ignore List of the policy.

Change the search type

Select a different item to search to update the namespace. VFM enables you to search for shares, subfolders, NetApp filer volumes, or qtrees. The next time the policy runs, it scans for the new items.

1. Perform one of the following actions:
   - Right-click the namespace creation policy and click **Properties**.
   - Select a namespace creation policy to show a Properties tab in the right pane and click Edit.
2. Click **Target Search**.
3. In the Search Type list, select a different item to search.
4. Optionally update the search string.
5. If you selected "Search Folders" as the search type, type a folder search string. VFM searches for subdirectories matching the folder search string of shares matching the string in the **Search string** field. If you want VFM to search for partial matches, select **Allow Partial Matches**.
6. Click **OK**.

Notes: The following example explains how the "Allow partial matches" option works.

- **Folder search string:** \\<machine>\share*\folder*\user*

- **Directories in the network**:

  \\server1\share1\folder1\user1
  \\server1\share2\folder1\user1
  \\server1\share2\folder1\user2
  \\server1\share3
  \\server1\share4\folder1
  \\server1\share5
  \\server1\share6\folder1

- **Search results when partial matches are allowed**:

  \\server1\share1\folder1\user1
  \\server1\share2\folder1\user1
  \\server1\share2\folder1\user2
  \\server1\share3
  \\server1\share4\folder1
  \\server1\share5
  \\server1\share6\folder1

- **Search results when partial matches are not allowed**:

  \\server1\share1\folder1\user1
  \\server1\share2\folder1\user1
  \\server1\share2\folder1\user2

Change the search string of a policy

Change the search criteria for a namespace creation policy.

1. Perform one of the following actions:
   - Right-click a namespace creation policy and click **Properties**.
   - Select a namespace creation policy to show a Properties tab in the right pane and click Edit.
2. Click **Target Search**.
3. In the **Search string** field, type a new word or pattern to match shares, volumes, or qtrees.
4. Optionally update the folder search string if "Search Folders" is the search type.
5. Click **OK**.

Change how the links are arranged

Change how new links are arranged in the namespace. Select a different template for a namespace creation policy. The next time the policy runs, the new links are arranged according to the new template. Existing links are not affected.

1. Perform one of the following actions:
    - Right-click the namespace creation policy and click **Properties**.
    - Select a namespace creation policy to show a Properties tab in the right pane and click Edit.
2. Click **Target Search**.
3. Select a new template from the Hierarchy Template list. A graphic view of how new links will be arranged in the namespace appears in the lower part of the dialog box.
4. Click **OK**.

Scan for items immediately

You can bypass the namespace creation policy schedule and manually start the scanning process any time you want.

1. Perform one of the following actions:
    - Right-click a namespace creation policy and click **Start Scanning Now**.
    - Select a namespace creation policy to show a Properties tab in the right pane, right-click anywhere on the tab, and then click **Start Scanning Now**.
2. Click **Scan**. If VFM finds items that match the search criteria, they appear under the DFS root that contains the links.
3. Perform one of the following actions:
    - Click **Create** to add the links that reference the items to the namespace.
    - Click **Cancel** if you do not want to add the links or if you want to have the option of selecting which links in the list you want to add to the namespace. To review the list of new items, select the policy to show the Properties tab on the right pane. Under New Resources, right-click an item and perform one of the following actions:
        - Click **Add as Link** to create a link and add it to the namespace.
        - Click **Ignore** if you do not want to reference the item from the namespace. VFM adds the item to an Ignore list. The next time the policy is scanned, VFM does not show these items as new resources.

Review the list of new resources before adding links

You can set up a namespace creation policy so that you can always review scanning results and determine which items you want to reference from the namespace.

1. Perform one of the following actions:
    - If you are creating a new namespace creation policy, clear **Create links after scanning**.
    - If you want to change an existing policy, right-click the policy and click **Properties**. On the General tab, clear **Create links after scanning**.
2. When VFM scans for items, search results are listed under New Resources on the Properties tab of the policy. To display the Properties tab, select the policy and the tab appears on the right pane.
    - To reference an item from the namespace, right-click the item and click **Add as Link**.
    - If you do not want to reference an item in the namespace and you do not want VFM to show the item again after the next scan, click **Ignore**. VFM adds the item to the Ignore list for the policy. To view the list, right-click the policy, click **Properties**, and then click **Ignore List**.

Delete a namespace creation policy

To delete a namespace creation policy, perform one of the following actions:

- Right-click the policy and click **Delete**.
- Select the policy and press the **Delete** key.
- Select the policy to show a Properties tab in the right pane. Right-click anywhere on the page and click **Delete**.

Chapter 4 Permission based policies

Permission based namespace policies enable you to populate a logical namespace based on the group permissions of shared folders and their subdirectories. Like namespace creation policies, permission based namespace policies enable you to easily populate and maintain a logical namespace. You can use these policies, like namespace creation policies, to perform the initial population of your namespace. After the namespace is in place, the policies can automatically run on a scheduled basis to scan for changes.

This chapter provides instructions about how to configure and manage permission based namespace policies.

Note: The VFM account must have permission to read the security descriptor of the shares and underlying folders you want the policy to scan.

Create and manage a permission based policy

This section provides instructions about how to configure and manage permission based namespace policies.

Note: The VFM account must have permission to read the security descriptor of the shares and underlying folders you want the policy to scan.

Configure a permission based policy

Configure a permission based namespace policy to automatically populate the logical namespace and to keep the logical namespace aligned with subsequent changes in the security permissions of underlying storage resources. Permission based namespace policies enable you to group shares in the namespace based on security permissions. The VFM account must have permission to read the security descriptor of the shares and underlying folders you want the permission based namespace policy to scan.

1. Perform one of the following actions:
    - On the **Tools** menu, click **New Policy**, point to **Namespace Policy**, and then click **Permission Based Policy**.
    - Right-click the **Namespace Policies** folder in Admin View, point to **New**, and then click **Permission Based Policy**.
    - Right-click the **Permission Based Policies** folder and click **New Permission Based Policy**.
    - Right-click

, click **New**, point to **Namespace Policy**, and then click **Permission Based Policy**.
2. Click **Next**.
3. Type a word or phrase that best describes this policy in the **Name** field.

4. Clear **Automatically modify namespace after scanning** if you do not want VFM to automatically create links for items that match the search criteria. After the policy runs, the items are listed under "New Resources" on the Properties tab that appears in the right pane when the policy is selected. You can create links for the items you want to include in the namespace.
5. Select one of the following:
    - **Search for items not already targeted from this policy's folder** when you do not want VFM to target shares and subfolders that are already targeted by links in the folder. This is the default.
    - **Search for items not already targeted from this root** when you do not want VFM to target shares and subfolders that are already targeted by links in the DFS root.
6. Select **Remove links whose shares no longer exist** when you want VFM to remove links targeting shares when a scan detects that the shares no longer exist.
7. Select **Remove links from the entire root** when you want VFM to scan the entire root and remove links targeting shares that no longer exist.
8. From the **Use the Monitor on** list, optionally select the machine where another monitoring agent is located.
9. Select whether you want VFM to limit the number of links that are added every time the policy runs. Accept the limit specified or change the limit. When this option is cleared, VFM adds links for all the candidates found. Microsoft recommends limits to the number of links that are added to a DFS root. See the overview for DFS for detailed information about recommended size limits.
10. Click **Next**.
11. Select an existing DFS root or click **New** to create a new DFS root to contain the links, and then click **Next**.
12. Group the links in a folder or add them under the root. Perform any of the following actions:
    - In the **Name** field, type a different name for the folder.
    - Click **New Folder** to create a new folder or subfolder.
    - Click **Delete** to remove the selected folder.
    - Click the root to add the links under the root.
13. Click **Next**.
14. Select the domain or domains that you want to search or select devices, and then click **Next**.
14. Click **Add** to browse for security groups that have access to resources on the domain or servers you selected.
15. Type a word or pattern in the **Search String** field. You can use DOS wild-card characters (* or ?) in the search string. You can use the asterisk (*) as a substitute for zero or more characters in a name and the question mark (?) as a substitute for a single character in a name. You can combine search strings by separating them with semi-colons; for example, entering mkt*;sales* finds all shares on the selected domains or servers whose names begin with either mkt or sales.
16. Select a search type.

17. If you selected "Search shares matching the search string for folders matching the following path", type a folder search string.

    Note: To search for folders, the VFM account must have "Read" and "List Folder Contents" permissions for the shares and subdirectories that match the search criteria.

18. Optionally select **Allow Partial Matches** if you want to search for partial matches. For an explanation about how partial matches works, see the "Notes" in the namespace creation topic "Change the search type."
19. Optionally select to search hidden and administrative shares.
20. Click **Next**. A list of items that match your search criteria appears.
21. Clear the check box of items that you do not want to add, and then click **Next**.
22. Select a template to arrange how links appear in the namespace. VFM enables you to preview the namespace.

    Note: If you selected domains to search for resources and the domains contain groups with the same name (for example, domain1\sales and domain2\sales), make sure that you select a template that sorts by domain, such as Domain-Group Name-Machine-Shares, Machines-Domain-Group Name-Shares, or Domain-Group Name-Shares. You cannot create links with the same name under the root or a logical folder of the namespace.

23. Click **Next**.
24. Optionally rearrange the links. You can move a link or folder, add a folder, add more links, remove a link or folder from the namespace and update the properties of a link.
25. Click **Next**.
26. Select **Use Schedule**.
27. Select how frequently you want to scan for items and click **Next**.
28. Click **Finish**. The new policy appears under the Permission Based Policies folder.

Notes:

- If you uninstall a monitoring agent, ensure that the permission based policies that formerly used the uninstalled agent are reassigned to a currently available agent. Right-click a permission based policy and click **Properties**. On the General tab, select a monitoring agent from the "Use this Monitor on" list.
- Namespace creation policies enable you to populate the namespace with links that reference shares, volumes, and qtrees. See "Configure a namespace creation policy" for detailed instructions.

Update the search criteria

VFM enables you to update the search criteria.

To change security groups:

1. Perform one of the following actions:
    - Right-click the permission based namespace policy and click **Properties**.
    - Select a permission based namespace policy to show a Properties tab in the right pane and click Edit.
2. Click **Groups**.
3. Perform one of the following actions:
    - Click **Add** to include additional groups
    - Select a group and click **Remove** to delete the item from the list.
4. Click **OK**.

To change search type or search string:

See the following namespace creation policy topics:

- Change the search type
- Change the search string of a policy

Other options

VFM enables you to update the permission based namespace policy. See the following namespace creation policy topics:

- Update the schedule
- Add or remove servers or domains
- Add items to an exclusion list
- Change how the links are arranged
- Scan for items immediately
- Review the list of new resources before adding links

Delete a permission based namespace policy

To delete a permission based namespace policy, perform one of the following actions:

- Right-click the policy and click **Delete**.
- Select the policy and press the **Delete** key.
- Select the policy to show a Properties tab in the right pane. Right-click anywhere on the page and click **Delete**.

Chapter 5 Namespace availability policies

Namespace availability policies enable you to easily keep the logical structure of two or more DFS roots and/or a DFS root and widelink namespaces aligned.

- By synchronizing roots, you can load balance the work on your DFS root server across multiple identical instances of the root. This also provides fault tolerance because the namespace is available from more than one server.
- By synchronizing a DFS root and a widelink namespace, your CIFS clients can access the namespace hosted on a filer.
- A namespace availability policy provides flexibility in configuring your namespace to make it highly available. See "Namespace configuration options."

This chapter provides instructions about how to create and manage policies to synchronize the logical structure of DFS roots and widelink namespaces to make them highly available.

Note: VFM enables you to create disaster recovery policies to make data highly available.

Create a namespace availability policy checklist

To create your first policy, follow the basic steps listed below:

1. Make DFS roots highly available or create a widelink namespace.
2. Schedule synchronization.

Planning considerations

Namespace availability policies enable you to easily keep the logical structure of two or more DFS roots and/or widelink namespaces aligned.

- By synchronizing roots, you can load balance the work on your DFS root server across multiple identical instances of the root. This also provides tolerance because the namespace is available from more than one server.
- By synchronizing a master root with a widelink namespace, you can host your namespace on a NetApp filer and your CIFS clients can access the namespace directly on the filer.

How it works

- During synchronization, VFM compares the logical structure of the secondary roots and widelink namespaces with that of the master root. If they are not the same, VFM synchronizes the logical structures of the secondary namespaces with that of the master root.
- You must have at least two DFS roots or one DFS root and one CIFS share on a filer.
- Create a namespace availability policy and add the roots or root and CIFS share where you will host the widelink namespace.
- Designate a root as the master.
- Schedule synchronization.

Planning considerations

- NetApp filers must run Data ONTAP™ 6.4 software or later to host a widelink namespace.
- For performance reasons and to avoid possible conflict with widelinks that might already exist under an existing share, it is recommended that you create and share a directory for hosting a widelink namespace instead of using an existing share. VFM scans the contents of a share assigned to host a widelink namespace and manages all widelinks found on the share.
- When synchronizing between roots in different domains, install the monitoring agent with an account that has privileges to read from the primary root and write to the secondary (slave) roots of the policy.
- When synchronizing between a master root and secondary roots in separate domains, you might need to set up multiple policies with a common master root and individual slave root in the domain in which the monitoring agent is privileged. In this configuration, the accounts for monitoring agents must have at least read privileges to access the master root. When running this configuration, you must use scheduled synchronizations instead of the manual "start synchronization now" operation. This is because the "start synchronization now" operation uses the monitoring agent on the VFM server due to the dynamic feedback provided by the manually initiated operation
- Links in a widelink namespace are restricted to having one target on line. Link timeout is set to 6 minutes by Data ONTAP and comments are not supported.

Options for setting up VFM namespace availability policies

The following are options for setting up namespace availability policies to make your namespace highly available:

- Users access the namespace through the widelink namespace and the master root is only used for administrative purposes. Whenever changes need to be made to the logical structure of the namespace, the changes are made on the master root. When the policy runs, the logical structure of the master root is synchronized with the widelink namespace.
- You can use the master root server of a namespace availability policy as the production server with the secondary root server held in reserve as backup in case the master root fails. If there is a failure, the secondary root server can assume the identity of master root server, enabling users to access the namespace at what they perceive as the normal location.
- You can make users aware of both the master root server and secondary root server as hosts of the namespace so that if one server fails, they know to access the namespace through its peer.
- You can run the namespace availability policies either alone or in conjunction with an IP load-balancing solution, such as NLB or an IP load-balancing switch.
- You can use stand-alone DFS roots in a VFM namespace availability policy in conjunction with DNS to provide the locality of reference benefits typically provided by domain-based DFS roots. To set up this configuration, follow these instructions:
    - Each region in which one of the roots in the namespace availability policy is located must have its own DNS server, and all clients and servers within a region access only their region's DNS server.

- Disable zone transfers between DNS servers for the server record so that each DNS server maintains its individual notion of the IP address of the DFS root server for the region.
- The servers hosting each root in the namespace availability policy must have the same host name but a different IP address. All users access the root through the same server name, but users are directed to the root closest to them.
- Add the individual roots to the namespace availability policy using IP addresses rather than host names, so that VFM can access each of the roots being synchronized.
- Use VFM to synchronize the logical structure of the roots.

Namespace configuration options

You have the flexibility of configuring your namespace in several ways to make it highly available.

- You can host the namespace on a filer.
  - You configure a namespace availability policy with a master DFS root and at least one secondary CIFS share on a NetApp filer where you will host a widelink namespace.
  - The logical structure of the DFS root is synchronized with the widelink namespace.
  - Your CIFS clients access the namespace on the filers.
- You can host the namespace on a filer and Windows systems or only Windows systems. See the illustration below.
  - You configure a namespace availability policy with a master DFS root and at least one secondary CIFS share on a filer and/or secondary DFS root on a Windows system.
  - The logical structure of the master DFS root is synchronized with the secondary root and widelink namespace hosted on the secondary share.
  - Your CIFS clients access the namespace on a filer and/or Windows system.

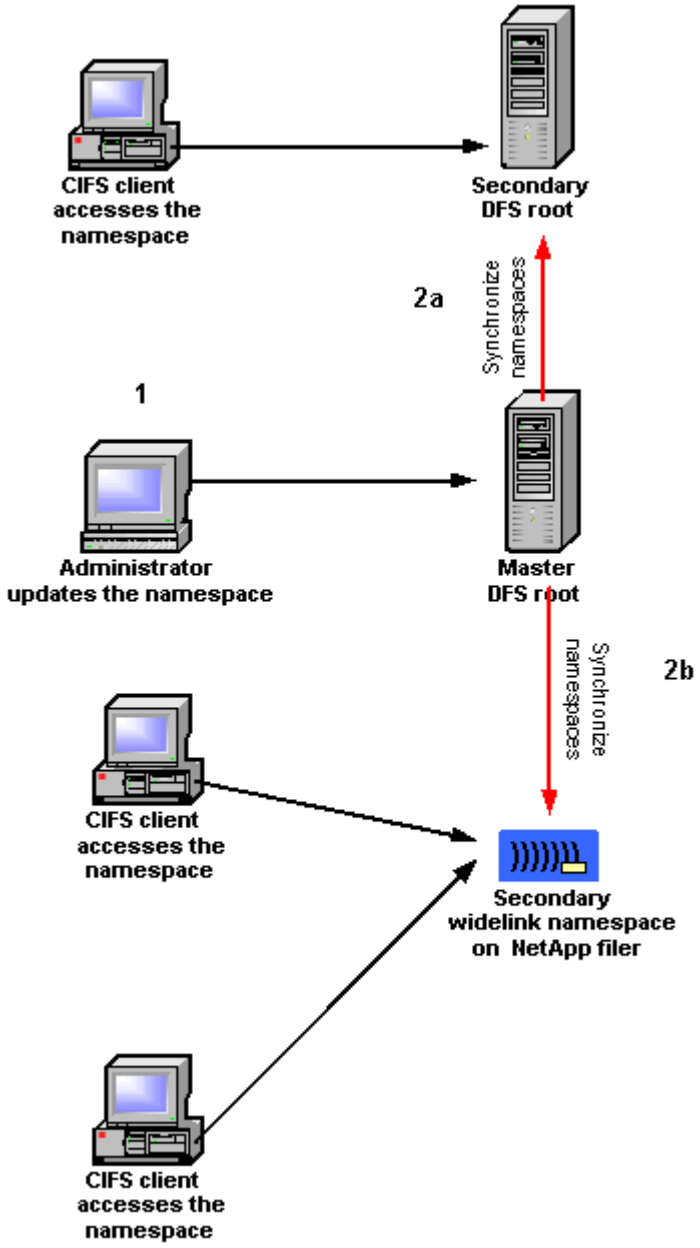


Figure 2 Namespace configuration options

Note: Namespace availability policies do not support creating widelink namespaces on shares hosted on vfilers.

Create and manage namespace availability policies

To create your first policy, follow the basic steps listed below:

1. Make DFS roots highly available or create a widelink namespace.
2. Schedule synchronization.

Make DFS roots highly available

Namespace availability policies enable you to synchronize the logical structure of two or more DFS roots

1. Perform one of the following actions:
   - On the **Tools menu**, click **New Policy**, point to **Namespace Policy**, and then click **Availability Policy**.
   - Right-click the **Namespace Policies** folder in the Admin View, point to **New**, and then click **Availability Policy**.
   - Right-click the **Availability Policies** folder and click **New Availability Policy**.
   - Right-click Admin View, click **New**, point to **Namespace Policy**, and then click **Availability Policy**.
2. Type a word or phrase that best describes this policy in the **Name** field.
3. Click **Add** and type the path of a root or click **Browse** to locate a root in your network.
4. Repeat Step 3 to add more roots. The policy must have at least two roots.
5. Select the master root. Secondary roots mirror the logical structure of the master root.
6. Select **Synchronize after scanning**.
7. Click **OK**.

Notes:

- Roots containing links participating in disaster recovery policies can also be members of namespace availability policies.
- In this configuration, as with disaster recovery policies containing links hosted on replicated domain-based roots, it is recommended that you configure the disaster recovery policies for manual fail over rather than for automatic fail over if the links target read/write data rather than read-only data.

Create a widelink namespace

Namespace availability policies enable you to create widelink namespaces on NetApp filers and synchronize the logical structure of a master DFS root with the widelink namespace. This enables CIFS clients to access the namespace directly through a filer instead of a Windows server.

Notes:

- The filer where you want to create a widelink namespace must be running Data ONTAP 6.4 or later.
- Namespace availability policies do not support creating widelink namespaces on shares hosted on vFilers.

1. Perform one of the following actions:
   - On the **Tools menu**, click **New Policy**, point to **Namespace Policy**, and then click **Availability Policy**.
   - Right-click the **Namespace Policies** folder in the Admin View, point to **New**, and then click **Availability Policy**.
   - Right-click the **Availability Policies** folder and click **New Availability Policy**.
   - Right-click Admin View, click **New**, point to **Namespace Policy**, and then click **Availability Policy**.
2. Type a word or phrase that best describes this policy in the **Name** field.
3. Click **Add** in the **Synchronize the following roots** field and type the path of the root, or click ... **Browse** to locate a root in your network.
4. Click **Add** in the **Synchronize the following NetApp filer shares** field and type the path of the share, or click ... **Browse** to locate the share in your network.
5. Select **Synchronize after scanning**.
6. Click **OK**. When the policy runs, VFM creates a widelink namespace hosted on the CIFS share specified in the policy and synchronizes the logical structure of the master DFS root with the widelink namespace.

Note: For performance reasons and to avoid possible conflict with widelinks that might already exist under an existing share, it is recommended that you create and share a directory for hosting a widelink namespace instead of using an existing share. VFM scans the contents of a share assigned to host a widelink namespace and manages all widelinks found on the share.

Namespace synchronization options

You can choose whether the logical structure of the roots and widelink namespaces should be automatically synchronized each time a namespace availability policy runs, or whether VFM should only report when the logical structure of the roots and widelink namespaces are not the same.

- **To automatically synchronize at specified times**

  Make sure that the "Synchronize after scanning" properties option is selected for a policy, and schedule synchronization.

- **To scan the roots for differences at specified times**

  Make sure that the "Synchronize after scanning" properties option is cleared for a policy and that you scheduled synchronization. VFM scans the roots and widelink namespaces according to the schedule and provides scan results, but the logical structure of the roots and widelink namespaces is not modified.
- **To manually synchronize root structures**

  Use the "Start synchronization now" option to manually initiate the synchronization of the logical structure of the roots and widelink namespace in the policy. If you did not select the "Synchronize after scanning" properties option, VFM enables you to synchronize after scanning is complete. Manually initiated scans or synchronizations are performed directly by the VFM server rather than by a monitoring agent to which the policy is assigned. This is because of the additional status information and user interaction provided by manually initiated scans.

Schedule synchronization

To make sure that changes made to the logical structure of the master root are synchronized with the secondary root and/or secondary widelink namespace, schedule how frequently you want to synchronize the logical structure.

1. Perform one of the following actions:
   - Right-click the namespace availability policy and click **Properties**.
   - Select a namespace availability policy and click Edit on the **Properties** tab that appears in the right pane.
2. Click **Schedule Monitoring**.
3. Click **New** to configure a new schedule.
4. Optionally, select **Use alternate schedule when the policy fails** and type a frequency, in minutes, to run the schedule any time replication fails.
5. Click **OK**.

Start synchronization immediately

You can bypass the synchronization schedule and manually start the synchronization process any time you want.

Manually initiated scans or synchronizations are performed directly by the VFM server rather than by a monitoring agent to which the policy is assigned. This is because of the additional status information and user interaction provided by manually initiated scans.

1. Perform one of the following actions:
   - Right-click a namespace availability policy and click **Start Synchronization Now**.
   - Click a namespace availability policy to show a Properties tab in the right pane. Right-click anywhere on the Properties tab and click **Start Synchronization Now**.

- Click the **Availability Policies** folder to show a list of policies in the right pane. Right-click a policy and click **Start Synchronization Now**.

The synchronization operation scans the logical structure of the roots and widelink namespaces in the policy and, if differences are detected between the master and secondary roots and widelink namespaces, changes are applied to the secondary roots and widelink namespaces to align their structure with that of the master root.

2. Expand the tree to view scanning results. If an error message appears, correct the problem before synchronizing. If no error messages appear, click **Synchronize**.

Notes:

- This menu item is disabled if a synchronization operation is in progress.
- To view detailed information about the synchronization operation, click the policy to show an Events tab in the right pane. Double-click the "Synchronization completed successfully..." event and expand the tree under Details.

Add additional roots or shares to a policy

A namespace availability policy must contain at least two DFS roots or a root and a widelink namespace. A policy can contain an unlimited number of roots and widelink namespaces.

Drag a root or CIFS share to a policy

VFM enables you to easily add DFS roots and CIFS shares that will host widelink namespaces.

- Drag a root from the Logical View or right pane to a namespace availability policy.
- Drag a CIFS share on a filer from the Physical View tree or right pane to a namespace availability policy. The filer hosting the share must be running Data ONTAP 6.4 or later.

To add a root or share to a policy:

1. Perform one of the following actions:
   - Right-click the namespace availability policy and click **Properties**.
   - Select a namespace availability policy and click Edit on the **Properties** tab that appears in the right pane.
2. Click **General**.
3. Click **Add** and type the path of a root, or click ... **Browse** to locate a root in your network.
4. Click **Add** in the **Synchronize the following NetApp filer shares** field and type the path of a CIFS share, or click ... **Browse** to locate a CIFS share on a filer in your network.
5. Repeat Steps 3 and 4 to add more roots and shares.
6. Click **OK**.

Note: When you add a CIFS share to a namespace availability policy, the filer is added to the All Resources and NetApp Filer Resources folders in the Physical View.

Remove roots and widelink namespaces

If you no longer want a DFS root or widelink namespace to participate in a namespace availability policy, perform one of the following actions:

- Right-click a root in the Logical View tree and click **Remove from Namespace Availability Policy**.
- Select a namespace availability policy to display a Properties tab in the right pane. Right-click a root or widelink namespace on the Properties tab and click **Remove from Namespace Availability Policy**.
- Double-click a namespace availability policy, right-click a root or widelink namespace under the policy and then click **Remove from Namespace Availability Policy**.

Change the master root of a policy

To designate the master root for a synchronization policy, perform one of the following actions:

- Select a namespace availability policy to display a Properties tab in the right pane. On the Properties tab, select a root.
- Right-click a namespace availability policy and click **Properties**. On the General dialog box, select a root.

Delete a namespace availability policy

When you delete a namespace availability policy, namespace synchronization is no longer available. DFS roots and widelink namespaces that were members of the policy can still be accessed.

1. Perform one of the following actions:
    - Right-click a namespace availability policy and click **Delete**.
    - Select the **Availabilities Policies** folder to display a Properties tab in the right pane. Right-click a policy and click **Delete**.
2. Click **Yes**.

Chapter 6 Multiprotocol namespace policies

Create a common namespace for UNIX and Windows users to provide access to files stored on NetApp filers. This presents a unified view of files to users. A multiprotocol namespace policy enables you to build namespaces for NFS clients to mirror the namespace presented to CIFS clients and to build namespaces for CIFS clients to mirror the namespace presented to NFS clients. VFM enables you to automatically synchronize the namespaces.

Planning considerations

Multiprotocol namespace policies enable you to create a common namespace for UNIX® and Windows users to provide access to files stored on NetApp filers. This presents a unified view of files to users. A multiprotocol namespace policy enables you to build namespaces for NFS clients to mirror the namespace presented to CIFS clients and to build namespaces for CIFS clients to mirror the namespace presented to NFS clients. VFM enables you to automatically synchronize the namespaces.

Prerequisites

The following list details prerequisites and restrictions to implementing a multiprotocol namespace policy:

- You have DFS roots containing links that target data on NetApp filers.
- You must be familiar with the NFS protocol and UNIX system.
- You must be familiar with configuring and managing NetApp filers.
- Your filers must be licensed for both CIFS and NFS protocols.

How it works

To create a multiprotocol namespace:

1. Provide the name of a DFS root with links targeting data on NetApp filers.
2. Provide the CIFS UNC path name to the directory that contains the automount and exports files that configure the UNIX namespace.
3. Create sync points, UNIX and DFS namespace resources that are synchronized. Indicate the direction of the synchronization of the logical structure of the namespace. Synchronization can be configured from a DFS namespace (CIFS) to a UNIX namespace (NFS), or from a UNIX namespace to a DFS namespace.
    - If the UNIX namespace is the master, you provide the location of the automount files that configure the namespace.
    - If the DFS namespace is the master, you provide a location where VFM places the automount files and export files created by the multiprotocol namespace policy.
4. Schedule sync point synchronization to update the logical structure from each synch point master.

Notes:

- Direct and indirect automount maps are supported.
- The multiprotocol namespace enables users to access directories hosted on NetApp filers that are accessible through both NFS exports and CIFS shares.

Example

The following example illustrates how VFM configures a UNIX namespace when the DFS namespace is the master and how NFS users access the same data on NetApp filers that CIFS users access.

In this example, you have a DFS namespace with DFS logical folders that contain links referencing CIFS shares on NetApp filers. You want your NFS users to access the same data. You create a multiprotocol namespace policy to perform the following actions:

- Automatically create the necessary UNIX files, apply exports, and push automount files to NIS.
- Create a sync point that specifies the DFS and UNIX namespace resources you want to synchronize.
- Configure the policy to periodically synchronize from the DFS namespace to the UNIX namespace.

In the following example, *National Sales* is a DFS logical folder in *DFS Root* that contains the *Marketing*, *Presentations*, *SalesReg1*, *SalesReg2*, *SalesReg3*, and *SalesReg4* links. Only the *SalesReg* links reference CIFS shares on NetApp filers. You configure a multiprotocol namespace policy to enable NFS users to also access the shares referenced by the *SalesReg* links.

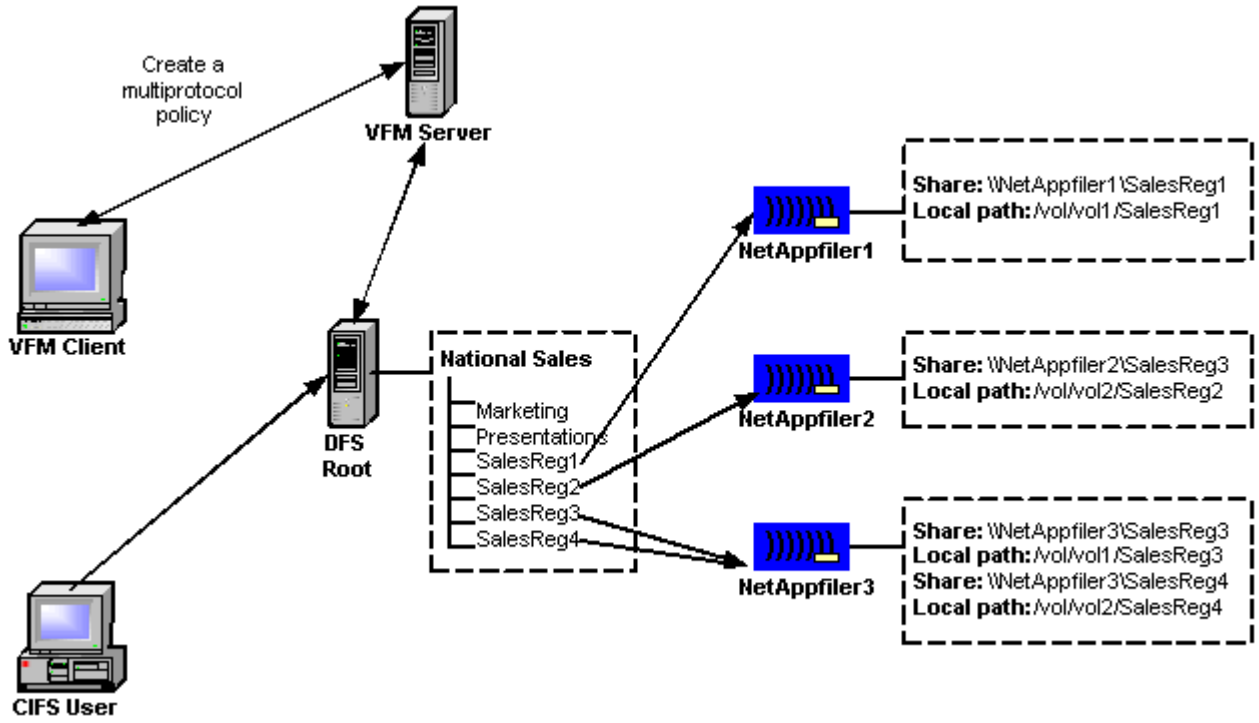


Figure 3 DFS namespace with links targeting CIFS shares

You configure the policy to create the UNIX namespace. The process is illustrated in the following diagram.

1. You designate a CIFS UNC path name on *NetAppfiler3* as the location to copy the automount and export files the policy creates when it runs. You create a sync point named *MySyncPoint*, where *My logical folder* is the DFS namespace resource you designate as the master and *MyUNIXNamespace* is the name you give to the UNIX namespace resource that will be synchronized from *National Sales*.
2. The VFM server applies the exports files to *NetAppfiler1*, *NetAppfiler2*, and *NetAppfiler3*.
3. The VFM server notifies the NIS client you specified in the policy to copy from *NetAppfiler3* the automount file named *MyUNIXNamespace*.
4. The NIS client copies *MyUNIXNamespace*.
5. The NIS client automatically pushes *MyUNIXNamespace* to the NIS database.

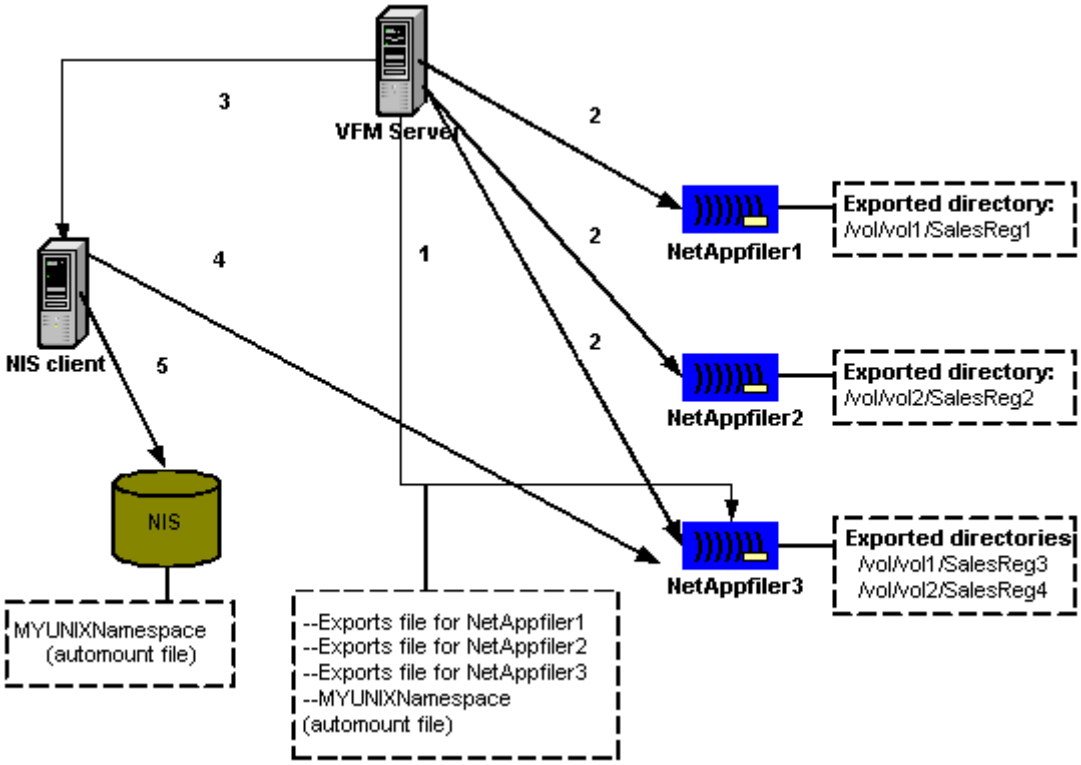


Figure 4 Multiprotocol namespace policy creates UNIX namespace

Your NFS users can now access the same directories as your CIFS users access through the DFS namespace.

1. The NFS client obtains automount maps from NIS.
2. The NFS client automounts the NFS exports from the filers to access the same directories as CIFS users access through the DFS namespace.

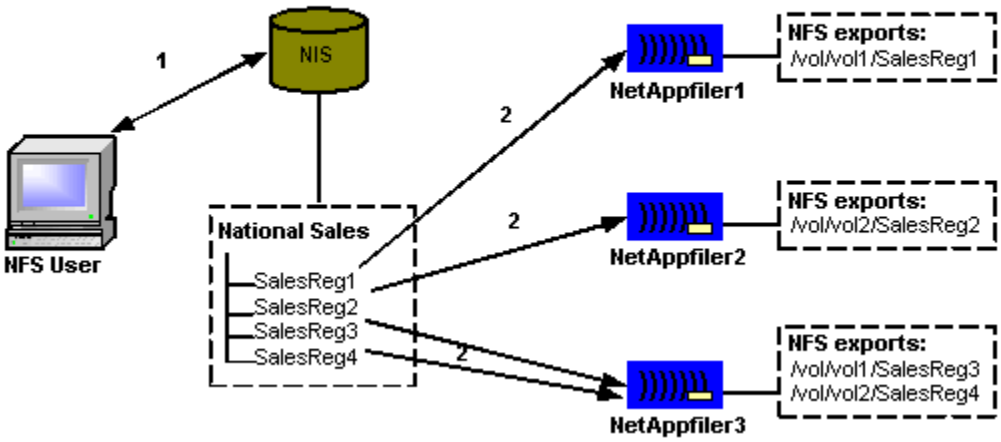


Figure 5 UNIX users access same directories as CIFS users

When any of the *SalesReg* links in *My logical folder* change, the policy creates a new automount file named *MyUNIXNamespace* that VFM pushed to the NIS database.

Restrictions

- Auto_master files are not supported.
- VFM does not support the Solaris-specific automount options, such as running executables and evaluating environment variables when determining the actual export to mount.

Create and manage multiprotocol namespace policies

To create your first policy, follow the basic steps listed below:

1. Create a multiprotocol namespace policy.
2. Host a UNIX namespace on a filer.
3. Configure UNIX clients to access the namespace.
4. Select default UNIX settings.
5. Add a sync point.
6. Schedule synchronization

Create a multiprotocol namespace policy

Create a multiprotocol namespace for CIFS and NFS clients. VFM enables you to automatically synchronize the namespaces.

1. Perform one of the following actions:
   - On the **Tools** menu, click **New Policy**, point to **Namespace Policy**, and then click **Multiprotocol Policy**.
   - Right-click the **Namespace Policies** folder in Admin View, point to **New**, and then click **Multiprotocol Policy**.
   - Right-click the **Multiprotocol Policies** folder and click **New Multiprotocol Policy**.
   - Right-click

, click **New**, point to **Namespace Policy**, and then click **Multiprotocol Policy**.
2. In the **Name** field, type a word or phrase that best describes this policy. The name appears under the Multiprotocol Policies folder and on the Properties tab of items that are members of the policy.
3. Type the name of a DFS root that contains links that target data on NetApp filers, or click **Browse** to locate a root in your namespace.
4. Perform one of the following actions:
   - If synchronization is from a UNIX namespace to a DFS namespace, type a CIFS UNC path name for the directory that contains the automount files describing the UNIX namespace.
   - If synchronization is from a DFS namespace to a UNIX namespace, type a CIFS UNC path name for the directory that will contain files created by VFM to configure the UNIX namespace.
   - Click **Browse** to locate the directory.

   Notes:
   - The CIFS UNC path name you enter in the **UNIX Files Location** field must be accessible to the VFM server.
   - The multiprotocol namespace enables users to access directories hosted on NetApp filers that are accessible through both NFS exports and CIFS shares.

5. From the **Use the Monitor on** list, optionally select the machine where another monitoring agent is located.
6. Optionally click **Select default share security** to select default share access permissions for all shares referenced by links contained the DFS namespace.
   - Click **Add** to select the users and groups to whom you want to assign permissions.
   - Select the permissions you want to allow each user or group.
   - Click **OK**.
7. Click **OK**.

Notes:

- Direct and indirect automount maps are supported. Auto_master files are not supported.
- The DFS and UNIX namespaces in a multiprotocol namespace policy must reference data on NetApp filers.
- VFM does not support the Solaris-specific automount options, such as running executables and evaluating environment variables when determining the actual export to mount.

Host a UNIX namespace on a filer

VFM enables you to automatically copy the contents of the export files it creates to the */etc/exports* file and run the command `exportfs -a` to make the new exports visible to NFS clients.

1. Perform one of the following actions:
   - Right-click a multiprotocol policy and click **Properties**.
   - Select a multiprotocol policy to show a Properties tab in the right pane and cllick Edit.
2. Click **Scripts**.
3. Select **Automatically apply exports**.
4. Click **OK**.

Configure UNIX clients to access the namespace

VFM enables you to automatically copy automount files to NIS.

1. Perform one of the following actions:
   - Right-click a multiprotocol policy and click **Properties**.
   - Select a multiprotocol policy to show a Properties tab in the right pane and click Edit.
2. Click **Scripts**.
3. Select **Push automount files to NIS**.
4. Type the name of an NIS client machine.
5. Type the name of a directory on the NIS machine where the automount files are temporarily copied.
6. Type the user RSH account of the NIS machine.
7. Type the path on the NIS machine where the make program is located.
8. Click **OK**.

Note: NFS clients that are making use of the automount files must have the directory that is specified in the automount files.

Select default UNIX settings

Set options to control NFS client access to the data.

1. Perform one of the following actions:
   - Right-click a multiprotocol namespace policy and click **Properties**.
   - Select the Multiprotocol Namespace Policies folder to display a Properties tab in the right pane, and then click Edit.
2. Click **Default UNIX Settings**. Select how you want to set up access restrictions. The following table provides several export settings options.

To...	Then do this...
Allow only specific client machines access to the data	1. Select **Restricted Access**. 2. In the **Allow Access** field, type the name of the machines, subnets, or netgroups that are allowed access.
Allow read-only access to the data to all machines	Select **Read-Only**.
Allow read-write access to specific client machines and read-only to all other machines	1. Select **Read-Only**. 2. In the **Allow Write Access** field, type the name of the client machines, subnets, or netgroups that are allowed read-write access.
Prevent root access to the data	Select **No Root Access**.
Allow root access to the data to all clients	Select **All Root Access**.
Allow root access to the data to only specific machines	1. Select **No Root Access**. 2. In the **Always allow Root Access** field, type the name of the client machines, subnets, or netgroups that always are allowed root access.

3. Optionally, change how entries specified by the automount map are mounted. The following list specifies the VFM default mount options:
   - Mount resources read-write.
   - Allow set user ID execution.
   - Soft mount, return an error if the server does not respond.
   - Do not allow keyboard interrupts of a process waiting on a hard mount.
4. Click **OK**.

Add a sync point

Add synchronization points between the master and secondary multiprotocol namespaces. The secondary namespace is updated when the logical structure of the master namespace changes.

1. Perform one of the following actions:
   - Right-click a multiprotocol namespace policy and click **Properties**.
   - Select a multiprotocol namespace policy to show a **Properties** tab in the right pane and click Edit.
2. In the **General** dialog box, click **New**.
3. Type a word or phrase that describes the data synchronized between the DFS and UNIX namespaces.
4. Indicates the direction of the synchronization of the logical structure of the namespace.
   - If DFS is selected, anytime the links in the DFS Logical Folder change, VFM updates the automount file and corresponding export files.
   - If UNIX is selected, anytime the contents of the automount file changes, VFM updates the links in the DFS Logical Folder.
5. Type the name of the DFS namespace folder that contains links targeting data on NetApp filers or click **Browse** to select the folder contained in the DFS root you specified in the **DFS Root** field.
6. In the **Automount File** field, perform one of the following actions:
   - If DFS is the master, type a name for the automount file that VFM will create.
   - If UNIX is the master, type the name of an automount file or click **Browse** to select the file in the directory you specified in the **UNIX Files Location** field.
7. Click **OK**. The new sync point appears in the **Sync Points** list.
8. Repeat Steps 2 through 7 to create additional synchronization points.
9. Click **OK**.

Note: The DFS and UNIX namespaces in a multiprotocol namespace policy must reference data on NetApp filers.

Schedule synchronization

To make sure that changes made to the logical structure of the sync points are synchronized from the master namespace, schedule how frequently you want to synchronize the logical structure.

1. Perform one of the following actions:
   - Right-click the multiprotocol policy and click **Properties**.
   - Select a multiprotocol policy and click Edit on the **Properties** tab that appears in the right pane.
2. Click **Schedule**.
3. Click **Add** and configure the schedule.
4. Click **OK**.

Run customized commands during synchronization

Specify batch files to run before and after namespace synchronization.

1. Perform one of the following actions:
   - Right-click a multiprotocol namespace policy and click **Properties**.
   - Select a multiprotocol namespace policy to show a Properties tab in the right pane and click Edit.
2. Click **Scripts**.
3. Select **Run Batch File Before Sync** and type the path where the script file is located, or click **Browse** to locate the file in your network.
4. Select **Run Batch File After Sync** and type the path where the script file is located, or click **Browse** to locate the file in your network.
5. Click **OK**.

Notes:

- See "Running batch files" in the VFM Advanced Configuration and Techniques Guide for detailed information about configuring batch files to run in VFM storage policies.
- See "Batch files" in the VFM Advanced Configuration and Techniques Guide for detailed information about the example scripts provided by VFM.

Update a multiprotocol namespace policy

Make changes to a multiprotocol namespace policy.

1. Perform one of the following actions:
   - Right-click a multiprotocol namespace policy and click **Properties**.
   - Select the Multiprotocol Namespace Policies folder to display a Properties tab in the right pane, and then click Edit **Edit**.
2. Change the appropriate information.
3. Click **OK**.

Start namespace synchronization immediately

You can bypass the synchronization schedule and manually start the namespace synchronization process any time you want.

1. Perform one of the following actions:
   - Right-click a multiprotocol namespace policy and click **Start policy now**.
   - Select the Multiprotocol Policies folder to show a Properties tab in the right pane. Right-click a policy and click **Start policy now**.
2. Click **Done**.

Delete a sync point

When you delete a sync point from a multiprotocol namespace policy, synchronization between the master and secondary resources is canceled. UNIX and DFS clients continue to access their respective namespaces as they are currently configured.

1. Perform one of the following actions:
    - Right-click the policy and click **Properties**.
    - Select the policy to show a Properties tab in the right pane and click Edit.
2. Click **General**.
3. Select the sync point you want to delete and click **Remove**.
4. Click **OK**.

Delete a multiprotocol namespace policy

When you delete a multiprotocol namespace policy, both DFS and UNIX clients can still access their respective namespaces as they are currently configured. Namespace synchronization is no longer available.

1. Perform one of the following actions:
    - Right-click a multiprotocol namespace policy and click **Delete**.
    - Select the **Multiprotocol Policies** folder to display a Properties tab in the right pane. Right-click the policy and click **Delete**.
2. Click **Yes**.

Chapter 7 Home folder policies

Many factors contribute to an enormous increase in network storage requirements, including the pervasiveness of wide area networking and users' ability to create and duplicate huge volumes of data. You face significant challenges migrating data and load balancing storage without affecting users. VFM home folder policies enable you to greatly simplify the management tasks associated with user home directory storage.

This section explains how to virtualize user home directories with VFM home folder policies.

Planning considerations

Add users' home directories to your namespace. You can group users in home folders to accommodate users from different domains and to place home directories at different points in the namespace. When users access their home directories from the namespace, load balancing and data migration can be performed without affecting users.

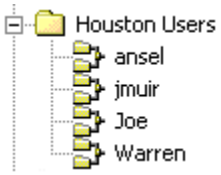
- **Creating a home folder policy**

  DFS roots have limitations in the number of links they can contain. Before you create a home folder policy, review DFS size limitations in light of the number of users to be added to the root, as well as the number of links that are already present in the root.

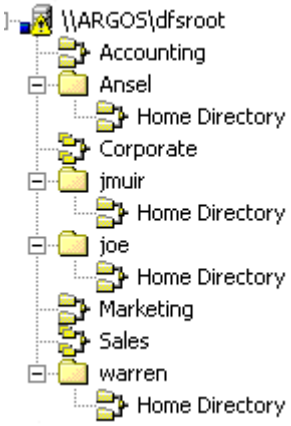
- **Customizing user access to data**

  Decide how you want to arrange user home folders in the namespace. VFM provides flexibility in how user home directories are accessed in the namespace.

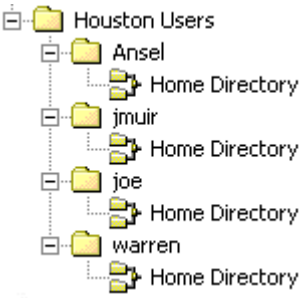
- **Users grouped in a folder**



- **Home directories in subfolders** (enables you to add links to the user home folder)



- **Users grouped in a folder and home directories in subfolders** (enables you to add links to the user home folder)



- **Moving user's share**

  Before you move a user's share, review "Data migration considerations" and "Preparing for data migration."

- **Deleting a home folder policy**

  When you delete a home folder policy, all the user links are deleted from the namespace. The application changes the users' account information so that their home folders reference the shares or directories that were targeted by the links in the home folder policy before you deleted the policy.

Create and manage home folder policies

When users access their home directories from the namespace, you can load balance and migrate user data without affecting users. VFM enables you to group users in home folders to accommodate users from different domains and to place home directories at different points in the namespace. You can also organize users' home directories as subfolders to facilitate the creation of personal namespaces for users.

Before you begin, review DFS size limitations on the number of links contained in a DFS root.

Create a home folder policy

1. Perform one of the following actions:
   - On the **Tools** menu, click **New Policy**, point to **Namespace Policy**, and then click **Home Folder Policy**.
   - Right-click the **Namespace Policies** folder in the Admin View, point to **New**, and then click **Home Folder Policy**.
   - Right-click the **Home Folder Policies** folder and click **New Home Folder Policy**.
   - Right-click

, click **New**, point to **Namespace Policy**, and then click **Home Folder Policy**.
2. Click **Next**.

3. Type a word or phrase that best describes this policy in the **Name** field. The name appears under Home Folder Policies and on the Properties tab of items that are members of the policy.
4. In the **Domain** field, type the name of the domain that contains the home directories, or click **Browse** to select a domain.
5. In the **DFS Root** field, type the name of the root that you want to add users' home directories, or click **Browse** to select a root.
6. In the **Link Template** fields, optionally type the name of folders where you want to group the home directories, and/or type the common name for the link that targets the users' home directory. If you select not to group users in folders, the users appear alphabetically by name in the Logical View under the DFS root selected. See "Organizing user home directories in the namespace" for examples of the different ways you can organize the user home folders.
7. Click **Next**.
8. Select the users you want to add to the namespace.
9. Select **Show users without a home folder** if you want to add users who do not have a home directory.
10. Click **Next**.
12. Click **Finish**.

Add a link to a user home folder

VFM enables you to customize user access to data.

Assumption

The home folder policy that contains the users was created to show user home directories in subfolders.

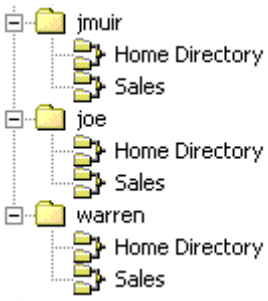
To add a link to a user home folder:

1. Right-click a user home folder and click **Add link**.
2. Type the name you want to give the link in the **User connect to** field.
3. Click **Add** and type the name of a shared folder or directory, or click ... **Browse** to display a list of domains from which you can select a share or subfolder.
4. Click **OK**.
5. Click **Done**. The new data is accessed as a subfolder on the user's home folder. Example

To add a common link to multiple home folders:

This organization can be useful, for example, when you need to give a set of users access to a directory containing information about a project on which they are collaborating.

1. Select the root that contains the user home folders to display a Properties tab in the right pane.
2. Select the user home folders listed under **Links**.
3. Right-click and click **Add link**.
4. Type the name you want to give the link in the **User connect to** field.
5. Click **Add** and type the name of a shared folder or directory, or click **Browse** to display a list of domains from which you can select a share or subfolder.
6. Click **OK**.
7. Click **Done**. The new data is accessed as a subfolder on the selected users' home folders.



Note: VFM enables you to update identical links in one easy step. When you rename, add, remove targets, or change the timeout of a link that appears in several places in the namespace, VFM displays a list of the identical links and enables you to update all the links simultaneously.

Add new users to a policy

Add new users to an existing home folder policy. If the users have home directories, they are added automatically to the namespace.

1. Perform one of the following actions:
   - Right-click the home folder policy to which you want to add users and click **Add Users**.
   - Right-click anywhere on the **Properties** tab of a home folder policy and click **Add Users**.
2. Select the users you want to add.
3. Select **Show users without a home folder** if you want to add users who do not have a home directory.
4. Click **Next**.
5. Click **Finish**.

View properties of a home folder policy

View the properties of a home folder policy.

1. Open **Home Folder Management** in the Admin View.
2. Perform one of the following actions:
    - Click a home folder policy. A Properties tab appears in the right pane. The list of users also appears in this tab.
    - Right-click a home folder policy and click **Properties**.

Refresh a home folder policy

Update the information for users in a home folder policy to reflect changes made in the domain.

Perform one of the following actions:

- Under the **Home Folder Policies** folder, right-click the home folder policy you want to update and click **Refresh**.
- Right-click anywhere on the Properties tab of the home folder policy and click **Refresh**.

Note: Refreshing the policy reevaluates how users named in the policy access their home folder but does not make any changes to the user accounts or to the links in the namespace.

Resolve discrepancies

Update user information and apply the rules you set for a home folder policy.

Discrepancies that VFM resolves

- **Users on the list with home directories but without a DFS link -** VFM adds links for the users to the namespace.
- **Users who were deleted from the domain -** VFM removes the users from the namespace but keeps their name on the list.
- **Users originally added to the list that did not have home directories -** VFM checks the domain, updates information for each user, and applies rules.

To resolve a discrepancy:

Perform one of the following actions:

- Right-click anywhere on the **Properties** tab of a home folder policy and click **Apply Rules**.
- Right-click a home folder policy and click **Apply Rules**.

Remove a user from a home folder policy

When you remove a user from a home folder policy, the user is only removed from the policy and the namespace. The user's data is not removed from the domain. The home directory setting in the user's profile is updated so that the user can access his home directory share.

1. Open **Home Folder Management** in the Admin View.
2. Perform one of the following actions:
    - Click a home folder policy. Under **Users** on the **Properties** tab that appears in the right pane, right-click a user and click **Remove**.
    - Right-click a home folder policy and click **Remove Users**.
        - Select the users you want to remove.
        - Click **Next**.
        - Click **Finish**.

Move a user

Move a user's share to another location and make this move transparent to the user. Before you move a user's share, review "Data migration considerations" and "Preparing for data migration."

1. Select a home folder policy to display the **Properties** tab in the right pane.
2. Under **Users**, right-click the user you want to move and click **Data migration**.
3. Use the Data Migration wizard to move the user's data and retarget the link.

Locate a user in the namespace

Find where a user is located in the namespace.

1. Click the home folder policy that contains the user. A **Properties** tab appears in the right pane.
2. Find the user in the list and click the link under **DFS Link**.

Locate a DFS root in the namespace

Find where the DFS root of a home folder policy is located in the namespace.

1. Click the home folder policy that contains the user. A **Properties** tab appears in the right pane.
2. Click the link next to **Base DFS Path**.

Note: You can also locate a DFS root in the namespace by clicking Logical View. A Properties tab appears in the right pane that shows a list of all the roots in the namespace. Double-click the root you want to locate.

Delete a home folder policy

When you delete a home folder policy, all the user links are deleted from the namespace. VFM changes the users' account information so that their home folders point directly to the targets that used to be pointed by links.

1. Right-click the policy you want to delete and click **Delete**.
2. Click **Yes**.

Chapter 8 Namespace backup policies

Create a namespace backup policy to back up the logical structure of DFS roots so that you can restore a root to a known state in the event that it is deleted or changes to the root need to be rolled back.

Backup

- Only the links of the DFS roots selected are backed up. Data referenced by links in the namespace and empty logical folders are not backed up.
- Permissions on logical folders are not backed up.
- The backup operation records the configuration data that VFM has currently gathered about the namespace.
- If you have cascaded roots, you must back up each root separately.

Restore

- Recreates the links contained in a backed-up DFS root onto a DFS root.
- Restore selected items in a backup file.
- You might encounter errors if you attempt to restore a backup configuration to a different type of root than it was originally created on. This can occur if you attempt to restore the backup set for a Windows 2000 DFS root to an NT4 DFS root. You can skip the problem steps in the confirmation dialog boxes and restore those aspects of the backup that apply to NT4 DFS roots.

Note: When you export your VFM configuration, all your DFS root backups are included with the export data. This enables you to restore a root that might no longer be available after you import the VFM configuration.

Create and manage Namespace backup policies

To create your first policy, follow the basic steps listed below:

1. Create a namespace backup policy.
2. Schedule backups.

Create a namespace backup policy

VFM enables you to automatically back up the logical structure of your namespace so that you can quickly restore it if it becomes necessary.

1. Perform one of the following actions:
    - On the **Tools** menu, click **New Policy**, point to **Namespace Policy**, and then click **Backup Policy**.
    - Right-click the Namespace Policy folder in the Admin View, point to **New**, and

then click **Backup Policy**.

- Right-click Admin View, click **New**, point to **Namespace Policy**, and then click **Backup Policy**.
- Select the Namespace Policies folder to show a Properties tab in the right pane. Right-click the Backup Policies folder and click **New Backup Policy**.

2. Type a word or phrase that best describes this policy in the **Name** field.
3. Click **Add** and type the path of a root, or click ... **Browse** to locate a root in your namespace.
4. Repeat Step 3 to add more roots.
5. Click **OK**.

Note: You can also manually back up a root. On the **Tools** menu, click **Manual backup**.

Schedule backups

Schedule how frequently you want to back up the roots participating in a policy.

1. Perform one of the following actions:
   - Right-click a namespace backup policy and click **Properties**.
   - Select a namespace backup policy to show a Properties tab in the right pane and click Edit.
2. Click **Schedule**.
3. Select **Use Schedule**.
4. Type the time and date you want to begin making backups
5. Select how frequently you want to make backups and type how many backups to keep.
6. Click **OK**.

Note: If you enable multiple schedules (for example, hourly, nightly, and weekly backups) and backups initiate at the same time, VFM only initiates the longer period backup. For example, if you schedule hourly and nightly backups that initiate at the same time, VFM only initiates the nightly backup. Multiple simultaneous backups are not initiated to avoid duplicate network traffic and the maintenance on duplicate backups.

Browse contents of a backup

VFM enables you to quickly view the contents of a backup.

1. On the **Tools** menu, click **Browse Backups**. A list of backup policies appears.
2. Double-click the policy that contains the backup file. Daily, Hourly, and Weekly folders appear.
3. Double-click the folder that contains the backup file. A list of backup files appears.
4. Double-click the backup file you want to view. A tree that looks like the Logical View

appears on the left pane.

5. Click an item in the tree to view its properties on the right-pane.
6. When you finish browsing, click **OK**.

Remove a root from a namespace backup policy

Remove a DFS root from selected namespace backup policies.

1. Right-click the root and click **Remove from Namespace Backup Policy**.
2. Select the policies where you want to remove the root.
3. Click **OK**.

Note: If the root is the only root participating in a policy, VFM does not remove the root from the policy. If you no longer want the policy to back up the root, delete the policy.

Delete a namespace backup policy

When you delete a namespace backup policy, all the backup files associated with the policy are deleted.

1. Perform one of the following actions:
   - Right-click a namespace backup policy and click **Delete**.
   - Select the Backup Polices folder to show a Properties tab in the right pane. Right-click the policy you want to delete and click **Delete**.
   - Select a namespace backup policy to show a Properties tab in the right pane. Right-click anywhere on the page and click **Delete**.
2. Click **Yes**.

Note: If you want to delete a root and retain the namespace backups for the root, perform the actions listed below. To help clarify the instructions, *TempRoot* is the name of a root you add temporarily to the policy. *DeleteRoot* is the root you want to delete and *NewRoot* is the root that you use to restore the contents of *DeleteRoot*.

1. Add *TempRoot* to the namespace backup policy that contains the root you want to delete.
2. Remove *DeleteRoot* from the policy and then delete the root.
3. Add *NewRoot* to the policy.
4. Restore the contents of *DeleteRoot* to *NewRoot*.
5. Remove *TempRoot* from the namespace backup policy.

Restore a DFS root

Restore the logical structure of a DFS root that you previously backed up. VFM restores the DFS links of the root.

1. Perform one of the following actions:
   - On the **Tools** menu, click **Restore from backup**.
   - Right-click Logical View and click **Restore**.
   - Right-click a DFS root and click **Restore**.
2. Click **Next**. A list of all the roots in your namespace appears.
3. Select the root where you will restore the links from a backup file.
4. Click **Next**.
5. Type the path of a backup file or click **Browse** to find the location of the file.
6. Click **Next**. If the backup file contains the logical structure of more than one root, a list of the roots appears. Select the root you want to restore.
7. Click **Next**. VFM compares the target DFS root with the backup root and shows the links that are different and the action that will be taken for each link.
8. Clear the links that you do not want to restore.
9. Optionally, click **View Backup** for a detailed view of each item in the backup root.
10. Optionally, select **Remove existing links** to remove existing links in the target root that are not in the backup root.
11. Click **Next**. A window displays the name of the backup file, the name of the DFS root you selected from your backup file, and the name of the DFS root you selected as the target of the restore process.
13. Click **Finish**.

Appendix

The following table lists the VFM guides. The list is arranged in ascending order by document title.

No.	Title	File name	Contents
1.	Advanced Configuration and Techniques	AdvancedConfig.pdf	• Explains how to use VFM to configure security permissions • Explains how to manage replication and monitoring agents • Explains how to run batch files in policies and reports • Explains how to make the VFM server highly available
2.	Data Lifecycle Automation Policies Guide	DataLifecyclePolicies.pdf	Explains how to create and manage archival migration policies to optimize storage.
3.	Data Movement Policies Guide	DataMovePolicies.pdf	• Explains how to transfer CIFS and NFS data by creating migration and replication policies • Explains how to transfer data between NetApp filers by creating SnapMirror policies • Explains how to load balance Windows servers by creating storage load balancing policies
4.	Disaster Recovery Policies Guide	DRPolicies.pdf	Explains how to make data highly available by creating client, filer, and server disaster recovery policies
5.	Getting Started Guide	GettingStarted.pdf	A tutorial to get you started using VFM. It explains how to install VFM and steps you through the process of creating a logical namespace, making the namespace highly available, making data highly available, transferring CIFS and NFS data, creating multiprotocol namespaces, virtualizing user home directories, and backing up data and the namespace.
6.	Manage Physical	PhysicalResources.pdf	Explains how to use VFM to work

No.	Title	File name	Contents
	Resources Guide		with NetApp filers, set replication properties, and work with Windows and UNIX machines
7.	Namespace Guide	Namespace.pdf	Explains how to create a DFS namespace (roots, links, and link targets), namespace creation, permission based, namespace availability, multiprotocol namespace, home folder, and namespace backup policies
8.	Reports Guide	Reports.pdf	Explains how to create and publish reports
9.	Snapshot Policies Guide	SnapshotPolicies.pdf	Explains how to use VFM to manage snapshots on NetApp filers using snapshot access and snapshot scheduling policies
10.	Troubleshooting Guide	Troubleshooting.pdf	• Includes diagnostic information, such as troubleshooting, event IDs, migration, replication, and status indicators • Provides examples of file exclusions and inclusions

Glossary

A

ACE: Access Control Entry, an entry in an Access Control List.

ACL: Access Control List, a list associated with a file that contains information about which users or groups have permission to access or modify the file.

Alternate volume: SEE Replica.

C

Child node: SEE DFS link.

CIFS: Common Internet File System. A file-sharing protocol based on the Microsoft Server Message Block (SMB). It enables you to share file systems over the Internet and Intranet. The CIFS protocol is used primarily for file sharing by Windows platforms.

Client: The user interface component of the application.

Consolidation DFS root: A special stand-alone DFS root that has its configuration information stored locally on a member server. The root must be hosted on Windows Server 2003.

D

Dependencies: The servers, drives, and shared folders that together contain the data published through the DFS namespace

DFS: Microsoft Distributed File System consists of software residing on network servers and clients that transparently links shared folders on different file servers into a single namespace for improved load balancing and data availability. NOTE: This should not be confused with Transarc's DFS product, which is a separate distributed file system product that is not interoperable with the Microsoft product.

DFS branch: SEE Shared folder.

DFS leaf: SEE Shared folder.

DFS link: Located under the DFS root. Forms a connection to one or more shared folders, DFS links, or another DFS root. NOTE: In Windows NT 4 terminology, this is referred to as a child node, a junction point, or an inter-DFS link.

DFS namespace: The logical view of shared file resources seen by users.

DFS path: A UNC path starting at a DFS root. Stand-alone DFS paths are rooted at a stand-alone root, while domain-based paths are rooted at a domain-based DFS root.

DFS root: The share at the top of the DFS topology. The starting point for the DFS links and shared folders that make up the DFS namespace.

DFS topology: Overall logical hierarchy of a distributed file system, including elements such as roots, links, shared folders, and replica sets.

DFS tree: The consolidated DFS view provided by the application, which includes the Admin View, Logical View, Physical View, and Reports.

DFS volume: SEE Shared folder.

Domain-based DFS root: A DFS root that has its configuration information stored in Active Directory. The root can have multiple root targets, which offers fault tolerance and load sharing at the root level.

E

Export: SEE NFS export

F

Fault-tolerant DFS: SEE Domain-based DFS root

FQDN: Fully-qualified Domain Name. A host, domain name, and a top-level domain. For example, www.nuview.com is a fully-qualified domain name where www is the host, .nuview is the second-level domain, and .com is the top-level domain.

FRS: Microsoft File Replication Service.

G

GID: Group Identification Number. A unique number assigned to identify a group of users in UNIX environments.

I

Inter-DFS link: SEE DFS link.

J

Junction point: SEE DFS link.

K

Key-pair: Consists of a public key and a corresponding private key. It is safe to distribute a public key,but a private key must be kept secret.

L

Link target: A DFS link can have as targets: 1 to N shared folders, OR 1 to N stand-alone DFS paths, OR only 1 domain-based DFS path.

M

Migration candidates: Items that match migration criteria in an archival migration policy. You can select which items you want to migrate. Items not selected for migration are automatically added to the exclusion list of the archival migration policy.

Migration tasks: Items to be migrated during a scheduled migration or manually at any time.

Monitoring agent: The component that can be installed to evaluate storage policies from a

different machine than the one where the application server is installed.

N

NFS: Network File System developed by Sun Microsystems. A file-sharing protocol that enables you to share file systems over the Internet and Intranet. NFS is used with both UNIX and non-UNIX computers.

NFS export: A directory that is published for access by NFS clients. The export specifies a directory to be exported and which machines have access to the directory. NFS exports are similar to CIFS shares in that they provide access to directories.

P

Pool: A group of storage locations.

Primary server: An active application server or monitoring agent.

Primary target: In a disaster recovery policy, this is the active target to which users are referred by the DFS root.

Q

qtree: A special directory of the root of a volume that behaves like a virtual subvolume with special attributes.

R

RAID: Redundant Array of Independent Disks enables file access even when a disk in a RAID group is damaged.

References: The DFS link targeting the selected physical item. For example, when you click a server under the Physical View tree, properties and associated DFS links appear.

Replica: A DFS root or DFS shared folder that provides an alternate path for a DFS link. NOTE: In Windows NT 4 terminology, this is referred to as an alternate volume.

Replica set: Two or more DFS roots or DFS shared folders that provide alternate paths for a DFS link.

Replication agent: The component deployed by the application server or monitoring agent component during configuration of storage policies that transfer CIFS data, or when you run a file differencing report. NOTES: Deployment of replication agents can be controlled through a machine's properties dialog box accessible from the Physical View. For data transfer using the NFS protocol, the replication agent must be installed manually.

Report schedule group: Enables you to set a schedule to automatically gather information. A report schedule group can be configured to start during off hours to offload network and computing resources during business hours. You can produce multiple reports from the data gathered without generating additional network traffic.

Report source group: Specifies the location where you want to gather information. It is assigned to a report schedule group. A report source group also enables you to specify batch files to run before and/or after the information is gathered.

Report type: Determines what information is gathered. Report types are assigned to report source groups.

S

Secondary target: SEE Standby target.

Server: The component that responds to requests from the client component, monitors the DFS namespace, and processes storage policies.

Shared folder: File or folder in the DFS namespace that can be accessed by users who have proper permissions. NOTE: In Windows NT 4, this is referred to as a DFS volume, leaf, or branch.

SID: Security identifier that uniquely identifies a Windows user or group.

Stand-alone DFS root: A DFS root that has its configuration information stored locally on the host server. The root has a single root target. When the root target is unavailable, the data referenced by links under the root is inaccessible.

Standby server: A machine that is standing by (not active) for the application server or a monitoring agent. During a failover, a standby server can become the active server.

Standby target: A target in a disaster recovery policy that is offline. During a failover, a standby target can become the active target.

Storage location: A combination of a server UNC path and the local path pointing to a directory in the file system. For example, \\rama:c:\ is a storage location representing the C drive on machine "rama" and \\secure.npb.com:/vol/vol0/myqtree is a storage location representing the qtree "myqtree" on volume vol0 on secure.npb.com.

T

Target: LINK TARGET: A shared folder, a DFS link, or a DFS root that is referenced by a DFS link. ROOT TARGET: A shared folder that is referenced by a DFS root. SEE ALSO Link target.

Trustee: The user account, group, or logon session to which an Access Control Entry (ACE) applies.

U

UID: User Identification Number. A unique number assigned to identify a user in UNIX environments.

UNIX file permissions: Control access to files and directories. Permissions can be applied to the owner of a file, a group, or everyone on the UNIX network.

W

Widelink namespace: A logical namespace hosted on a NetApp filer CIFS share that provides the benefits of a namespace without requiring additional Windows servers.

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