



Operating System

Distributed File System (DFS): Best Practices and Troubleshooting Guide

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Abstract

This guide is designed for administrators to supplement existing Distributed File System (DFS) documentation. It contains important information about DFS that has not been adequately addressed in other places. Because much of this information is the result of questions asked by customers, this guide is presented in "frequently asked questions" (FAQ) format. New issues and their solutions will be added periodically.

Note *This guide does not provide any introduction to DFS, nor does it document how the DFS namespace can be configured and administered.*

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Introduction

The Distributed File System (DFS) allows system administrators to make it easier for users to access and manage files that are physically distributed across a network. With DFS, you can make files distributed across multiple servers appear to users as if they reside in one place on the network. Users no longer need to know and specify the actual physical location of files in order to access them. For example, if you have marketing material scattered across multiple servers in a domain, you can use DFS to make it appear as though all of the material resides on a single server. This eliminates the need for users to go to multiple locations on the network to find the information they need.

This document contains important information for administrators about DFS that has not been adequately addressed in existing documentation. Because much of this information is the result of questions asked by customers, this document is presented in a “frequently asked questions” (FAQ) format. New issues and their solutions will be added to this document as they arise.

The DFS terms used in this document have been changed to reflect post-Microsoft® Windows® 2000 terminology. The following table outlines how DFS terminology has changed from Windows NT® version 4.0 to today:

Windows NT 4.0	Windows 2000	Post-Windows 2000
Fault-tolerant root	Domain root	Domain DFS
Child node, junction (point), volume, branch	DFS link	Link
Leaf, alternate	Root replica, replica	Root target, target

Note This document does not provide any introduction to DFS, nor does it document how the DFS namespace can be configured and administered. Also, the DFS utility tool DFSutil is referred to in several places; this tool and its functionality are documented separately.

Best Practices

Q: How many targets can be configured for the DFS root and DFS links?

A: There are no hard-coded limits for the number of DFS root and link targets that can be configured for a domain or stand-alone DFS. However, large DFS configurations can cause significant increased network traffic originating from updates made to roots, links, and targets. How large the namespace must be before it begins to affect the network is not known, but problems have occurred when the amount of data, determined by the number of roots, links, and targets in the DFS namespace, reaches 5 megabytes (MB).

There are also limits to how much DFS namespace information can be stored on a client computer. When a user traverses a root or a link in the DFS namespace and requests access to a portion of the namespace, the client sets up a session with the appropriate DFS server in order to receive a referral, or list of targets that corresponds to an available resource. The client then adds the list of available targets to its local cache. The number of targets provided in the referral is based on the fixed size buffer of the client's cache, which is currently 4 kilobytes (KB), allowing for roughly 2,000 Unicode characters. When the DFS server provides the referral, the client will choose a target from the referral in the following manner:

If targets exist in the same site as the client, then one of the targets at the top of the referral list will be selected at random.

If no targets exist in the same site as the client, then one of the targets near the bottom of the referral list will be selected at random.

Assuming that the DFS root server is correctly configured for Microsoft Active Directory™, the client will select the closest target possible.

Note DFS site selection is ignored if DFS links refer to servers that are located in more than one Active Directory site. This situation can occur under the following conditions:

You are accessing the DFS root or link from the console of a DFS server.

You are accessing the DFS root or link over a Terminal Services session to a Terminal Services-enabled DFS server.

For more information, see [Q274411](#), "Console and Terminal Services Access to DFS Share Ignores Site Preference," in the Microsoft Knowledge Base.

Configuring Root and Link Targets

Administrators should take into consideration the following information when configuring root and link targets:

- All DFS knowledge for a domain DFS is maintained in Active Directory. Updates to the DFS configuration initially take place on the domain controller hosting the primary domain controller (PDC) operations master role. Active Directory replication provides all other domain controllers in the domain with a consistent copy of the DFS configuration using multi-master replication. This means that the DFS namespace might not always be exactly the same on all domain controllers due to replication latency.

- The client used to administer DFS will contact the closest domain controller, which in turn will propagate the changes to Active Directory by contacting the PDC for that domain. Configuring a root target in a site that is very distant from the PDC can be quite expensive, especially if the DFS namespace changes often. Consider this when you determine the placement of domain controllers, domain DFS root servers, shared folders, and DFS clients with respect to one another. The most important thing is to place frequently accessed data on the same sites as the primary users of the information.

It is recommended that administrators configure no more than 16 root targets in a DFS namespace.

Q: What are the best practices when using File Replication service (FRS) to replicate DFS?

A: When using FRS as the replication mechanism for DFS roots and links, observe following the guidelines..

- Avoid configuring FRS replication on a DFS root. Rather, configure replication on DFS links, so that:
 - Data can be broken up into smaller, more manageable pieces during initial sourcing, or when restoring it in the event of failure.
 - Individual targets can be brought online or taken offline using the Enable/Disable Mapping feature in the DFS console. This is helpful if the member hosting the target is in an error state or is sourcing data. It is not possible to bring individual roots or root targets online or offline using this same feature.
- To reduce NTFRS journal Wrap errors, keep the FRS service running at all times and increase the size of the NTFS USN Change Journal.
- Avoid making local changes to FRS replicated content while the service is turned off.

Also, remember that FRS replicates files in sequential order according to when files are closed, but file size and link speed determine the order of completion. Because FRS replicates only whole files, the entire file will be replicated even if you change only a single byte in the file.

For more information about troubleshooting FRS, see [Q257338](#), "Troubleshooting Missing SYSVOL and Netlogon Shares," in the Microsoft Knowledge Base.

Q: How many links can be configured in a DFS namespace?

A: There are no hard-coded limits for the number of links that can be configured in a domain or stand-alone DFS, only recommendations. It is possible to add between 20,000 and 100,000 links, depending on whether you are configuring a domain or a stand-alone DFS. It is recommended that administrators configure no more than 5,000 links in any domain DFS namespace, and 10,000 links in any stand-alone DFS namespace. Beyond these limits, scalability issues could occur. Some of the implications for exceeding these limits are listed below.

Stand-Alone DFS

- Boot performance of operating system degrades when 20,000 links are exceeded in a single DFS root.

Note DFS client performance will not be affected.

Domain DFS

- When the number of links exceeds the recommended limit, you might experience performance degradation when making changes to the DFS configuration.
- Replication latency and overhead will be affected.

In cases where you must configure a very large DFS namespace, it is recommended that administrators create multiple DFS namespaces — each having no more links than the limits suggested above. Administrators will still be able to provide a single namespace to users by creating a single DFS namespace whose links point to the multiple DFS namespaces.

Note A one root per server limit will no longer restrain DFS in post-Windows 2000 releases. New DFS functionality will allow multiple domain and/or stand-alone roots per server. This feature improves the scalability of DFS, enabling administrators to build many large namespaces while still providing file location transparency.

Q: How can I estimate the size of my DFS namespace?

A: In a domain DFS, the namespace (comprising the DFS root, the links, the root and link targets, and the site information) is stored as one object in Active Directory. It is recommended that the size of this object be limited to 5 MB. Exceeding this size could cause administrative actions, such as adding links or adding link targets, to fail.

Planning the Namespace

The following formula can be used to determine the size of the Active Directory object while planning the namespace:

- For each DFS root and for each link, the DFS overhead is 180 bytes.

The total space, in bytes, taken up by a root is $180 + (\text{number of characters in DFS Name} * 4) + (\text{number of characters in each root target} * 2)$.

The total space, in bytes, taken up by each link is $180 + (\text{number of characters in the link name} - \text{number of characters in the domain name}) * 4$

- For each DFS root target or target, the DFS overhead is 20 bytes.

The total space, in bytes, taken up by a target is $20 + (\text{number of characters in target name} * 2)$

- For each unique server that is added as a target or root target, site information takes up some space.

This space, in bytes, is $12 + (\text{number of characters in server name} + \text{number of characters in site name}) * 2$.

Q: What type of computer can host a root in a DFS namespace?

A: To host a root for a stand-alone or domain DFS, the computer must be running Windows 2000 Server or later. For a domain DFS, the computer must also be a member of the domain in which the DFS is configured.

A server in a child domain cannot be a root target for a DFS root in the parent domain, and vice versa. DFS will enforce a domain membership requirement when the root target is configured.

Note While a domain controller can host a DFS root, there is no requirement that the DFS root be located on a domain controller.

Q: Does renaming a server or installing a new version of the operating system affect DFS in any way?

A: If the server is hosting a stand-alone DFS, renaming the computer will not affect DFS. If the server is hosting a root or root target for a domain DFS, the root or root target must be removed from the DFS namespace *before* the name of the server is changed. If the root or root target is not removed before the server is renamed, DFS will have to be repaired. Refer to the [Problem Resolution and Troubleshooting](#) document for details.

Before performing a fresh installation of a new version of your current operating system, the server must be removed from the DFS configuration; performing an upgrade of your current operating system does not have this requirement and will have no effect on DFS. If a server is hosting a stand-alone DFS, the computer will no longer be hosting the DFS after a fresh install. If the server is not removed from the DFS configuration before the fresh install, DFS will have to be repaired. Refer to the [Problem Resolution and Troubleshooting](#) details.

Not performing the preceding actions in either of the above cases will result in the following:

- DFS will assume that the server is still hosting a DFS root or root target, and will continue to pass this information to the clients.
- The server will not be able to provide DFS clients with seamless access to the entire DFS namespace, because it does not realize it is no longer hosting a DFS root or root target.
- Clients will experience inconsistent behavior when accessing the DFS namespace—depending on the target chosen from the referral list.
- When renaming a server, assigning the name of an existing computer in a DFS root to a new installation with the same name will cause a DFS client to access the new computer, because the original server's information will still be stored in the client's cache. However, the new computer will not be able to provide the client with seamless access to the entire DFS namespace, because it has not been properly configured for the DFS.

Q: Does changing the name of a domain controller affect DFS?

A: See comments in the sections above for changing the name of a server for those cases where the DC is hosting a DFS root: [What machine can be configured as a ROOT target in a DFS namespace?](#), and [Does renaming a Server affect DFS in any way?](#)

Changing the name of a domain controller could also affect a client's access to the DFS namespace for a short period of time following the name change. A DFS client needs to communicate with a domain controller in its domain when it needs a list of referrals for a domain whose DFS it has not previously accessed. The client will cache the name of the domain controller it communicates with for this purpose, and update the

cache at intervals, currently set at 15 minutes. Changing the name of a domain controller will result in loss of access to this information until the next time the cache is updated. For more information about DFS client query intervals in Windows 2000 and later, see the article Q265395, "Windows 2000 Member Runs Discovery Every 15 Minutes" in the Microsoft Knowledge Base.

Q: What credentials are necessary to administer DFS?

A: To administer a stand-alone DFS, a user must be a member of the Local Administrators group on the root server.

To administer a domain DFS, a user must be a member of the Local Administrators group on each of the root targets to be able to add and delete links and add and remove the root targets.

Special privileges are required to create and delete the DFS namespace:

- A user must be delegated privileges in the DFS container in Active Directory.
- A user must also be a member of the Local Administrators group on each of the root targets that are being added or deleted.

See the following section for more details.

Q: How do I delegate permission to users so that they can administer a DFS?

A: To delegate permission for administering a stand-alone DFS, you must add the user to the Local Administrators group.

To delegate permission for administering a domain DFS, you must add the user to the Local Administrators group on each of the root targets. The user must also be given privileges on the root object in Active Directory, which is located in the DFS-Configuration container. The distinguished name of the DFS container in Active Directory that the delegated user account must have access to is:

(CN=DFS-Configuration, CN=System, DC=<name of domain>....)

By giving rights to the user on the DFS-Configuration container, you can enable a user to create new DFS namespaces and administer existing ones. You can also limit administration privileges to a single, existing DFS namespace by granting rights to only the DFS namespace object contained in the DFS-Configuration container.

Because you can only delegate permission to administer an entire DFS namespace, and not parts of it, the granularity of delegation is the entire DFS namespace. You cannot delegate parts of the DFS namespace (such as adding links or targets) separately.

Delegating Permission for Administering a DFS

This process will grant the new user privileges to create new DFS namespaces and administer existing ones.

1. Open **Active Directory Users and Computers**.
2. On the View menu, select **Advanced Features**.
3. In the left pane, expand **System** by clicking the plus (+) sign.
4. Under System, expand **DFS-Configuration**. The configuration for the DFS root and links will appear in the

right pane.

5. Right-click **DFS-Configuration** and select **Properties**. This will bring up the **DFS-Configuration Properties** dialog box.
6. Click the **Security** tab.
7. Click the **Add** button, and select the user who will be delegated the administrator rights.
8. Allow Full Control access, and click **Apply**.

Granting User Privileges to a Single DFS Namespace

To grant a user privileges to a single DFS namespace, right-click the root object of interest in step 4, and bring up the Properties sheet for the root object. Complete steps 5 through 8.

When granting privileges to a single DFS namespace, give the user Full Control.

Note When granting privileges to the DFS-Configuration object, giving Full Control to numerous users is not advised.

Q: How do I get DFS to work in a WINS-less environment?

A: The default behavior of DFS is to use NetBIOS names for all network shares configured in the DFS namespace. This allows clients that support NetBIOS-only name resolution to locate and connect to targets in the DFS namespace. However, clients that do not use NetBIOS (DNS only, for example) will not work in this environment.

DFS can operate in a DNS-only environment, where all the computers understand fully qualified names.

Required Registry Key

The following registry key must be added to each server that will participate in the DFS namespace in order for all computers to understand fully qualified names.

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControl Set\Services
  DFS
    DFSDnsConfig = REG_DWORD 1
```

This registry key should be added to the servers before the DFS namespace is built. This will allow all the clients to see fully qualified names when they are referred to other servers as part of the DFS referral process.

Caution Use extreme caution when setting this registry key. If this key is not set on all DFS servers, or if it is set on servers that operate in a hybrid environment (of DNS-only and NetBIOS-only), access to the DFS namespace could be severely affected.

Q: Is DFS limited to only providing referrals to servers in the same site as the client?

A: Domain DFS is site-aware, which means that when a client requests access to a portion of the DFS namespace, it attempts to discover and connect to targets located in the same site. If no targets in the same site can be reached, clients can access targets belonging to other sites.

However, administrators can force DFS clients to access only those servers that are in the same site as the client.

This control can be enforced on the entire DFS namespace (DFS root and all its links) or on individual DFS links.

- DFSutil /insite <DFS-name-of-root-Or-link> /Set
- DFSutil /insite <DFS-name-of-root-Or-link> /Reset

When this command is executed on the DFS root, the behavior is inherited by all the links under that root. Any changes made to set or reset the same-site behavior will not go into effect immediately. The DFS root targets periodically synchronize with changes made to the DFS metadata, and the change will go into effect when all root targets have read the newly made changes.

Caution Use extreme caution when setting this control on a DFS root or link. If it is set on a DFS link that does not have any targets in a certain site, no clients in that site will be able to access the data using the DFS namespace.

Q: Are there any restrictions on the share names that are configured as root targets of a DFS namespace?

A: DFS allows any share name to be configured as a root target of the DFS namespace. However, the share name that appears in the DFS namespace is reserved by DFS on all roots and root targets. This reservation is mainly for the purposes of backward compatibility with earlier versions of clients.

Example

\\DomainY\DFSX has 2 targets: \\Computer1\Target1, and \\Computer2\Target2.

- DFS does not require that Target1 and Target2 be called DFSX. However, the name DFSX is reserved by DFS on Computer1 and Computer2, and on the domain controllers of DomainY.
- To avoid confusion, it's recommended that the DFS root name and the root target names configured in the DFS namespace be identical.

Note Access to names reserved in the DFS namespace always result in access to the DFS namespace. This is true even when a share name exists on the computer and was not configured as part of the DFS namespace.

Q: Are there any access restrictions to domain DFS namespaces?

A: All clients that belong to the domain hosting the DFS namespace have seamless access to the DFS namespace. This is also true for clients belonging to domains that trust the domain hosting the DFS namespace.

Clients that belong to a workgroup, or that belong to domains that do not trust the domain that is hosting the DFS namespace, will only be able to access the DFS namespace if the domain name can be resolved locally by the name resolution mechanism in place.

Clients that have difficulty accessing the DFS namespace can work around the problem by using a different method to access the namespace, such as replacing the name of the domain with the name of the server they are trying to access. The name of the domain needs to be replaced with the name of one of the root targets.

Example

\\DomainY\DFSX is the DFS root. There are 2 root targets named \\Computer1\Target1 and \\Computer2\Target2.

- The clients in the workgroup and untrusted domains will not be able to access the namespace by specifying the \\DomainnameY\rootnameDFSX. However, they can work around this by accessing the actual server name using either \\Computer1\Target1 or \\Computer2\Target2.
- The only drawback these clients will see is the loss of fault tolerance that is implemented at the DFS root level. This is because they are using a specific computer to traverse the namespace.

Q: Is there a limitation on the number of characters in any component of the DFS namespace?

A: DFS by itself has no limitation on the number of characters in any component of the DFS namespace. Microsoft Win32® application programming interfaces (APIs) have a MAX_PATH limitation of 260 characters, and applications will fail when trying to access a UNC or directory path that goes beyond this limit.

There may be situations where the DFS namespace does span more than 260 characters. In those situations administrators may be able to map part of the namespace to a drive letter and access the longer namespace through the mapped drive letter.

Q: Is there any limit on the number of DFS roots in a domain?

A: There is no hard limit on the number of DFS roots in a domain. Since a server can be a root target of—at most—one DFS root, the number of DFS roots in a domain can be no more than the number of servers in that domain.

Q: I need to back up and restore my DFS namespace. Are there any tools for this purpose?

A: There are two tools, DFScmd.exe and DFSutil.exe, that can be used to back up and restore a DFS namespace.

DFScmd has a “/batch” switch that generates a script used to back up the DFS namespace to a text file that you specify. You can back up and restore the DFS namespace using the following commands:

To back up the DFS namespace to a text file using DFScmd.exe:

```
DFScmd /view \\DomainName\DFSRootName /batchrestore > DFS_backup.bat
```

To restore the DFS namespace from the same text file using DFScmd.exe:

DFScmd /view \\DomainName\DFSRootName /restore > DFS.backup.bat

You can also use DFSutil.exe to back up the DFS metadata.

To back up the DFS metadata to a text file using DFSutil.exe:DFSutil /view:

\\DFSRootName\DFSTargetName /export:DFS_backup.bat

To restore the DFS metadata from the same text file using DFSutil.exe:

DFSutil /view: \\DFSRootName\DFSTargetName /import:DFS_backup.bat

Q: Can DFS be administered remotely from more than one location?

A: DFS can be administered remotely from more than one client computer. The DFS APIs communicate with one of the DFS root servers, which in turn will update the DFS metadata that holds the namespace information.

Q: How does DFS guarantee the consistency of DFS metadata when it is administered from more than one location?

A: A stand-alone DFS configuration stores the DFS metadata on the DFS root server. Consistency is maintained by the root server, which handles all DFS administration APIs.

A domain DFS stores the DFS metadata as a single object in Active Directory. All root servers maintain consistency by communicating metadata updates to a single domain controller that is the PDC operations master.

Active Directory replication provides a consistent copy of the DFS metadata to all other domain controllers in the domain once the object has fully replicated.

Problem Resolution and Troubleshooting

Note To solve several DFS-related problems, the DFS namespace needs to be repaired. A utility called DFSutil.exe can be used to make those repairs. (DFSutil.exe is version 2.0 of DFSutil.)

Q: A new version of Windows Server was installed on a DFS root target. How should DFS be repaired?

A: Upgrading your current version of Windows on a DFS root or root target will not affect the DFS configuration. However, installing a new version of Windows on a root or root target will cause some issues. For more information about the implications of doing this, see "Does renaming a server or installing a new version of the operating system affect DFS in any way?" earlier in this document.

To repair DFS by removing a server from the DFS configuration, use DFSutil.exe—from any client in the domain—and type the following:

- **DFSutil /unmap:\\Domain\DFSRootName \\Server\Share**

The server can then be added back by using the DFS administrative console or the following command:

- **DFSutil /Addroot:DFSRootName /Server:ServerName /Share:ShareName**

Q: The name of a server hosting a DFS root target has been changed. How should DFS be repaired?

A: If it is possible, the name of the server should be changed back to the original computer name. Using the DFSutil tool, remove the server from the DFS configuration. Rename the server, and if necessary, add the server back into the DFS configuration.

Repairing DFS

When it is not possible to revert back to the original name, the following steps can be used to repair DFS:

From the Client

From any client in the domain, execute the following commands:

1. **DFSutil /unmap:\\Domain\DFSName \\OldServerName\Share**
2. **DFSutil /clean:NewServerName**
3. **DFSutil /reinit:NewServerName**

From the Server

From the server, execute the following commands:

1. **Net stop DFS**
2. **Net start DFS**

At this point, the server with the changed name is ready to be added back as a DFS root replica of any DFS in that domain.

Q: When I attempted to remove the last root target, access was denied. An error message stated the DFS can no longer be administered. What should I do?

A: This happened because the root target was successfully deleted, but the user did not have the privileges necessary to delete the DFS namespace.

Repairing DFS

To repair DFS do the following:

1. Log in with the credentials of a user who has privileges to write to the DFS-Container object in Active Directory. (See [“What credentials are necessary to administer DFS?”](#) to delegate rights to this container in the Active Directory.)
2. Execute the command **DFSutil /unmap:\\Domainname\DFSRootName**.
 - o This will remove the DFS called DFSRootName from the specified domain.

Caution This command should be used with utmost care.

This command will succeed even when DFS has a list of root targets, and will remove the DFS namespace from Active Directory. The root target servers will continue to behave as DFS roots for any clients that access the namespace—in cases where the client has cached information about the namespace. New clients will no longer be able to access the now-defunct namespace.

Cleaning Up Root Targets

To clean up any root targets that were left hanging, use the following commands:

1. **DFSutil /clean:TargetServerName**
2. **DFSutil /reinit:TargetServerName**

Q: A server hosting a DFS root target or link target was moved from one Active Directory site to another, causing DFS site selection to break. What should I do?

A: This is caused by a limitation in the current DFS implementation. DFS reads the server's site information when the target member is added to the DFS namespace, and stores that information for future use. DFS will not re-read new site information if the server is moved to a different site.

Fixing the Problem

You can use either DFSutil.exe or DFScmd.exe to remove incorrect site information for a target and add new site information for the same target.

Post-Windows 2000 versions allow new site information for the target member to be re-established by using the DFS administrative console to:

- Take the target member offline, and then put it back online again using the Enable/Disable Mapping feature; or,
- Remove the server from the DFS configuration as a target, and then add it back as a target again, causing DFS to read the server's new site information and assign the proper referrals.

Effects of Removing the Server from DFS and Adding It Back Again

Using the DFS administrative console to remove the server from DFS, and then add it back again, may have some undesirable results if FRS is used for replication.

- Removing the server from DFS will cause it to be removed from the FRS replica set.
- Adding the server back into the DFS configuration will cause FRS replication to go into effect for that server and replicate all data.

This problem can be avoided by using the DFS tools to remove the server and then add it back into the DFS namespace as follows:

To remove a target (\\Member\Share) from a link in the DFS configuration type the following command:

- **DFScmd /remove \\Domain\DFSRootName\linkName \\Member\Share**

To add the target back into the DFS configuration type the following command:

- **DFScmd /Add \\Domain\DFSRootName\linkName \\Member\Share**

To remove a target (\\rootSrv\rootShare) from the root in the DFS configuration DFSutil type the following command:

- **/Remroot:DFSName /Server:rootSrv /Share:rootShare**

To add the target back into the DFS configuration type the following command:

- **DFSutil /Addroot:DFSName /Server:rootSrv /Share:rootShare**

Caution The Remroot option should not be used when the root target being removed is the only root target for the DFS namespace. Doing so will cause the entire DFS namespace to be removed!

Q: Why do I see unusual (or morphed) directory names when using FRS to replicate DFS root targets ?

A: This is an issue caused by the interaction of these two Windows 2000 components.

When a link is added to the DFS namespace, DFS creates a directory on each root target. These directories represent the link, and primarily exist for enumeration. When FRS is enabled on the root targets, it attempts to replicate the directories created by DFS. Because the directories located on each root target have the same name, a collision will occur when they are replicated. FRS detects these collisions during replication and resolves them by renaming the colliding directories. The renamed directories show up with unusual names, for example, "linkname_ntfrs_1fab4343."

Periodically, DFS will delete a directory and re-create it on each root target. This will trigger the directory to replicate and will cause name collisions. This is because DFS has created the same new directory on all root targets. This might occur even if there have been no new links added to the DFS namespace.

If there is a non-conflicted directory that has all the same files in it that the conflicted directories do, you will need to delete all the conflicted directories.

Caution Do not delete the conflicted directories without checking their contents first.

If you can identify a conflicted directory that contains all the files it is supposed to have and the non-conflicted directory is empty, delete the empty non-conflicted directory and rename the conflicted directory, giving it the non-conflicted directory's name.

If various conflicted directories contain some good data, then copy the data of interest to either the non-conflicted directory or the most complete conflicted directory, and use the method described here to build a complete non-conflicted directory.

Note Avoid configuring FRS replication on a DFS root. For more information, see "[What are the best practices when using FRS to replicate DFS?](#)" earlier in this document.

Resolution

This behavior has been fixed in Windows 2000 Service Pack 2 (SP2). For more information about this problem and how to fix it, see [Q291377](#), "FRS Creates Unneeded Folders in DFS Root Alternates," in the Microsoft Knowledge Base.

Q: Why do some of my client computers have trouble accessing the DFS namespace?

A: While this should be rare, it is possible that certain computers will have trouble accessing the DFS namespace for the following reasons:

The Root of a Stand-Alone DFS May Not Be Available

The computer that is the root of a stand-alone DFS may have been unavailable when DFS attempted to contact it. This could cause one of the network redirectors on the client to claim ownership of the namespace, thus bypassing DFS.

Resolution

This situation should be temporary, and will get fixed automatically within 15 to 20 minutes after the last access to the namespace.

The Domain Name May Not Be Resolving Correctly

It is possible the client belongs to a workgroup or to an untrusted domain, and has trouble accessing the domain DFS namespace. This is usually due to the domain name not being resolved correctly on the client computer.

Requirement

For clients in a workgroup, or clients that belong to an untrusted domain, DFS has an additional requirement that the domain name used to access the namespace be resolved to the name of a domain controller for that domain.

Q: When administering DFS, it reports, "The internal database maintained by the DFS service is corrupt." What does that mean?

A: This is caused by a known issue in DFS and has been fixed in SP1 of Windows 2000.

Temporary Workaround

It is possible to temporarily work around the problem.

1. Go to each DFS root and stop and restart the DFS service:
 - Perform Net Stop DFS, followed by Net Start DFS.
2. Do this each time DFS reports internal database corruption.

Resolution

Apply SP1 of Windows 2000 to resolve this problem permanently. For more information about this problem and how to fix it, see [Q261122](#), "Error Message: The Internal Database Maintained by the DFS Service Is Corrupt" in the Microsoft Knowledge Base.

Q: Why does site selection appear to fail if any root target or target is located on a domain controller?

A: This is caused by a known issue in DFS and has been fixed in SP1 of Windows 2000.

If a root target or target is located on a domain controller, and that domain controller is the one the client usually contacts for special DFS-related information, DFS will choose the domain controller over all other targets, regardless of site information. This causes DFS to ignore the site preference.

Resolution

There is no workaround to this problem. Apply SP1 of Windows 2000 to resolve this problem.

Q: Why doesn't site selection work when DFSutil's import feature is used to add links?

A: When using the DFSutil.exe import feature, the script file used in the import must contain the site information for each member being added. The newly added targets will not belong to any site unless this information is provided in the import script.

To determine the site name of a target, use:

```
nltest—Nltest /dsgetsite /server:ComputerName
```

This will give you the name of the site to use in the DFSutil script file.

Q: When administering DFS, I receive the message "Specified domain could not be contacted." What does that mean?

A: DFS uses the PDC operations master for any updates necessary to the DFS metadata. If the PDC does not exist, the error reported back to DFS is usually "System error 1355 has occurred. The specified domain either does not exist or could not be contacted."

This is the error that DFS reports back to the administrator.

Solution

Make sure the PDC operations master exists, and that information about the current PDC is available on the client. To report this information on the client, use:

- **Nltest /dsgetdc:domainname /pdc**

Summary

- This document covers best practices for DFS, including information on limitations and pointers on how to:
 - Configure root and link targets.
 - Use FRS to replicate DFS.
 - Plan the DFS namespace.
 - Delegate permission to users.
- This document also addresses problem resolution and troubleshooting, such as how to:
 - Repair DFS when there are problems at the root target.
 - How and when to remove the server from DFS and add it back again.
 - How to respond to various error messages.

For More Information

For more information about Distributed File System in Windows 2000, check out the following links:

[File and Print Services Technical Overview](http://www.microsoft.com/windows2000/techinfo/howitworks/fileandprint/fileprint.asp)

<http://www.microsoft.com/windows2000/techinfo/howitworks/fileandprint/fileprint.asp>

[Distributed File System](http://www.microsoft.com/windows2000/techinfo/howitworks/fileandprint/dfsnew.asp)

<http://www.microsoft.com/windows2000/techinfo/howitworks/fileandprint/dfsnew.asp>

[Managing Resources with Distributed File System](http://www.microsoft.com/windows2000/demos/mod12.htm) (Online Demo)

<http://www.microsoft.com/windows2000/demos/mod12.htm>

[Step-by-Step Guide to Distributed File System](http://www.microsoft.com/windows2000/techinfo/planning/fileandprint/dfssteps.asp)

<http://www.microsoft.com/windows2000/techinfo/planning/fileandprint/dfssteps.asp>