



# Distributed File System Configuration Guide

For IHS Applications

IHS AccuMap®

June, 2009



# IHS – Application Support Information

## Microsoft Distributed File System

### IHS Inc.

#### **Summary**

It has been shown that the performance of the AccuMap application is increased when user top database files are stored on a network share that has been created using Microsoft's Distributed File System (DFS). This document will detail the steps necessary to create a DFS share and to re-configure the AccuMap application to take full advantage of performance gains.

#### **Audience**

This document is intended for IT staff supporting or installing AccuMap and other IHS Energy applications. The procedures described require Administrator privileges on a Windows 2000/2003 server.

#### **Installation and Configuration**

The performance gains are apparent when the users' tops database files (utopa.\*, uwella.\*) reside on the DFS root. IE: If you create a DFS root share at \\servername\dfsroot then the tops database file should be stored in \\servername\dfsroot\usertops\username.

The AccuMap application need not be relocated to a DFS share, just the users' tops files.

#### **Understanding the DFS Terminology**

If you are not familiar with DFS, review the following terms and definitions to understand the important elements of a DFS configuration.

*DFS namespace:* A virtual view of shared folders on different servers as provided by DFS. A DFS namespace consists of a root and many links and targets. The namespace starts with a root that maps to one or more root targets. Below the root are links that map to their own targets.

*DFS root:* The starting point of the DFS namespace. The root is often used to refer to the namespace as a whole. A root maps to one or more root targets, each of which corresponds to a shared folder on a separate server. The DFS root must reside on an NTFS volume. A DFS root has one of the following formats: \\servername\rootname or \\domainname\rootname.



**Root target:** A physical server that hosts a DFS namespace. A domain-based DFS root can have multiple root targets, whereas a stand-alone DFS root can only have one root target.

**Stand-alone DFS namespace:** A DFS namespace whose configuration information is stored locally in the registry of the host server. The path to access the root or a link starts with the host server name. A stand-alone DFS root has only one root target. Stand-alone roots are not fault tolerant; when the root target is unavailable, the entire DFS namespace is inaccessible. You can make stand-alone DFS roots fault tolerant by creating them on clustered file servers.

**Domain-based DFS namespace:** A DFS namespace that has configuration information stored in Active Directory. The path to access the root or a link starts with the host domain name. A domain-based DFS root can have multiple root targets, which offers fault tolerance and load sharing at the root level.

**DFS path:** Any Universal Naming Convention (UNC) path that starts with a DFS root.

**Link:** A component in a DFS path that lies below the root and maps to one or more link targets.

**Link target:** The mapping destination of a link. A link target can be any UNC path. For example, a link target could be a shared folder or another DFS path.

Figure 1.0 illustrates the elements of a stand-alone DFS namespace in the Distributed File System snap-in. These elements include a stand-alone DFS root, a single root target, and multiple links.

**Figure 1.0 Elements of a Stand-Alone DFS Namespace**

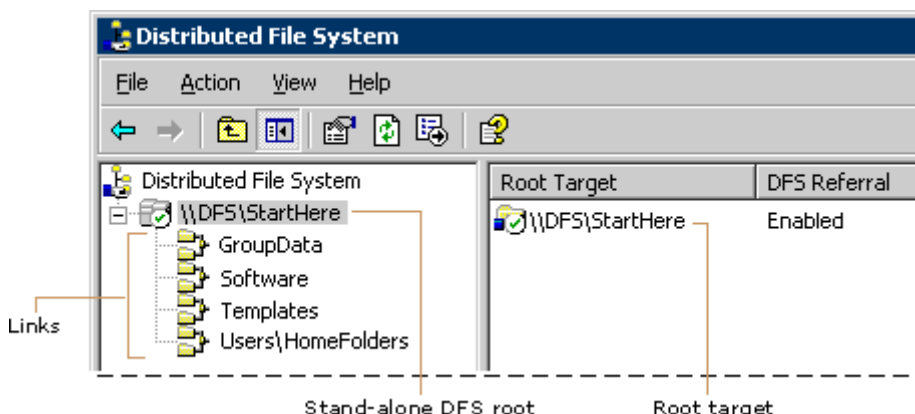




Figure 1.1 illustrates the elements of a domain-based DFS namespace in the Distributed File System snap-in. Notice that the \\Reskit.com\Public root has two root targets on different servers.

**Figure 1.1 Elements of a Domain-based DFS Namespace**

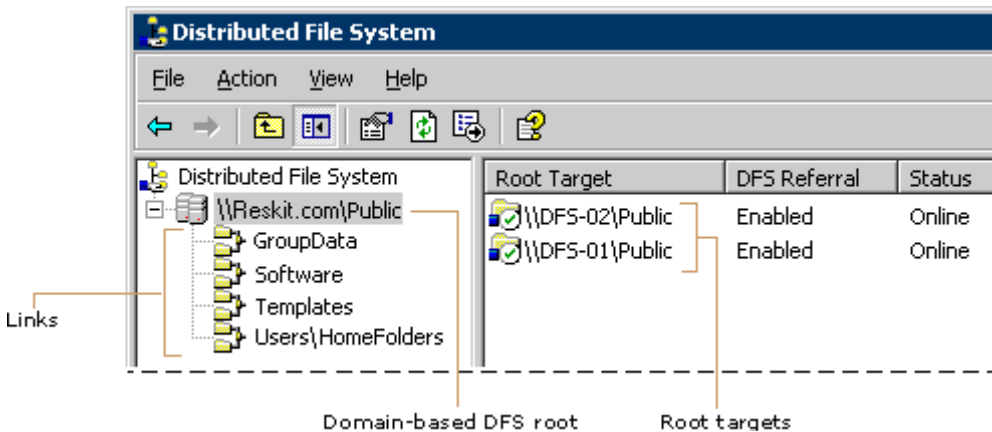
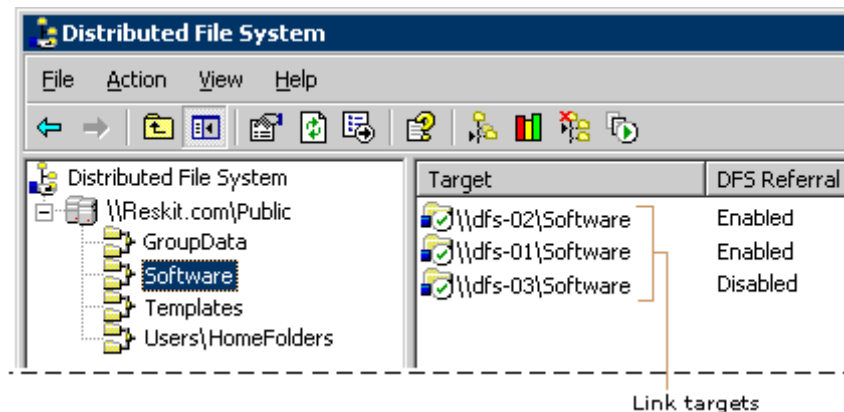


Figure 1.2 illustrates multiple link targets for the Software link. Notice that the link targets exist on three different servers and that the administrator has disabled referrals to the link target on \\dfs-03. DFS will not refer clients to the link target on \\dfs-03 until the administrator enables referrals.

**Figure 1.2 Multiple Link Targets**



The roots and links displayed in the Distributed File System snap-in also appear on each root server's local storage as follows:

- When you create a DFS root, you specify a shared folder to use as the root folder. If you add multiple root targets to a domain-based DFS root,



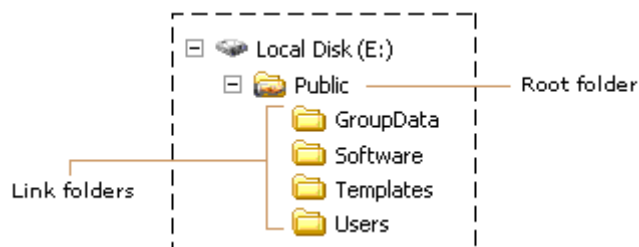
you specify a shared folder on each of those root targets. (The shared folder names should always match the root name.)

- When you add links to the root, DFS creates special folders under each root folder. These folders, called link folders, are actually reparse points, and they display the following error message if you try to access them on the local server:

E:\Public\GroupData is not accessible. The network location cannot be reached. Users who access the link folders from across the network are redirected to the appropriate link target.

Figure 1.3 illustrates volume E:\ on the local storage of one of the root targets. The volume contains root and link folders for the \\Reskit.com\Public namespace.

**Figure 1.3 Root and Link Folders**





## Creating a DFS Share

The Microsoft Distributed File System, or DFS, is a set of client and server services that allow a network administrator to organize many distributed file shares into a distributed file system. DFS provides location transparency and redundancy to improve data availability in the face of failure or heavy load by allowing shares in multiple different locations to be logically grouped under one folder, or DFS root.

When users try to access a share that exists off the DFS root, the user is really looking at a DFS link and the DFS server transparently redirects them to the correct file server and share.

A DFS root can only exist on a Windows 2000 version that is part of the server family, or on Windows Server 2003. Windows 2000 can only host one DFS root per server, while Windows Server 2003 can host multiple DFS roots on the same server.

There can be two ways of implementing DFS on Windows 2000 and Windows Server 2003:

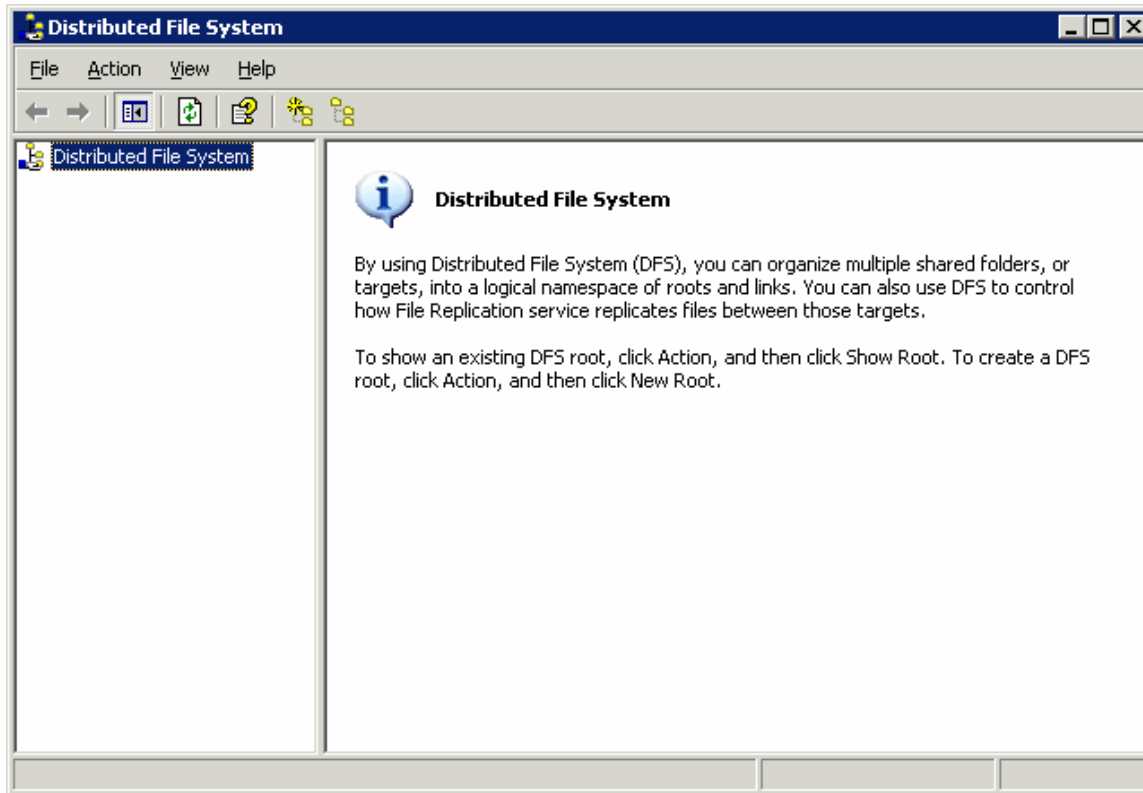
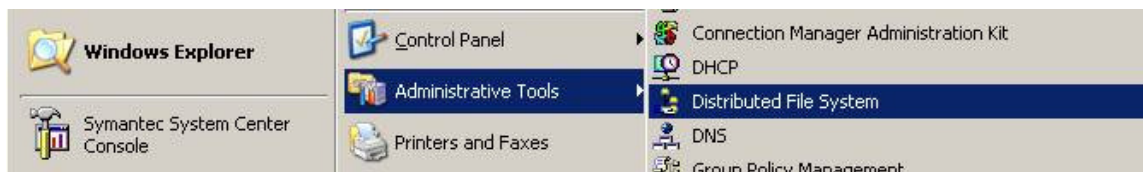
- *Stand-alone DFS Root* allows for a DFS root that exists only on the local computer, and thus does not use Active Directory. The local registry, not Active Directory, is used to store DFS configuration information. Broader administrator access is possible than with domain-based DFS, because members of the local Administrators group on the local server can implement a standalone DFS setup; membership in the Domain Administrators group is not required. A single, standalone DFS namespace can support as many as 50,000 links.
- *Domain DFS root* exist within Active Directory and can have their information is distributed to other domain controllers within the domain — this provides fault tolerance to DFS. DFS roots that exist on a domain must be hosted on a domain controller. This is to ensure that links with the same target get all their information replicated over the network. The file and root information is replicated via the Microsoft File Replication Service (FRS).

If you are implementing DFS just to store AccuMap user tops files, then the Stand-alone DFS Root method will work whether you have Active Directory or not.

If you have existing DFS name space, it is important to note that the AccuMap files must reside in a folder off of the DFS root. Storing the AccuMap tops files on a share that is just linked to the DFS name space will not result in any application performance gains.



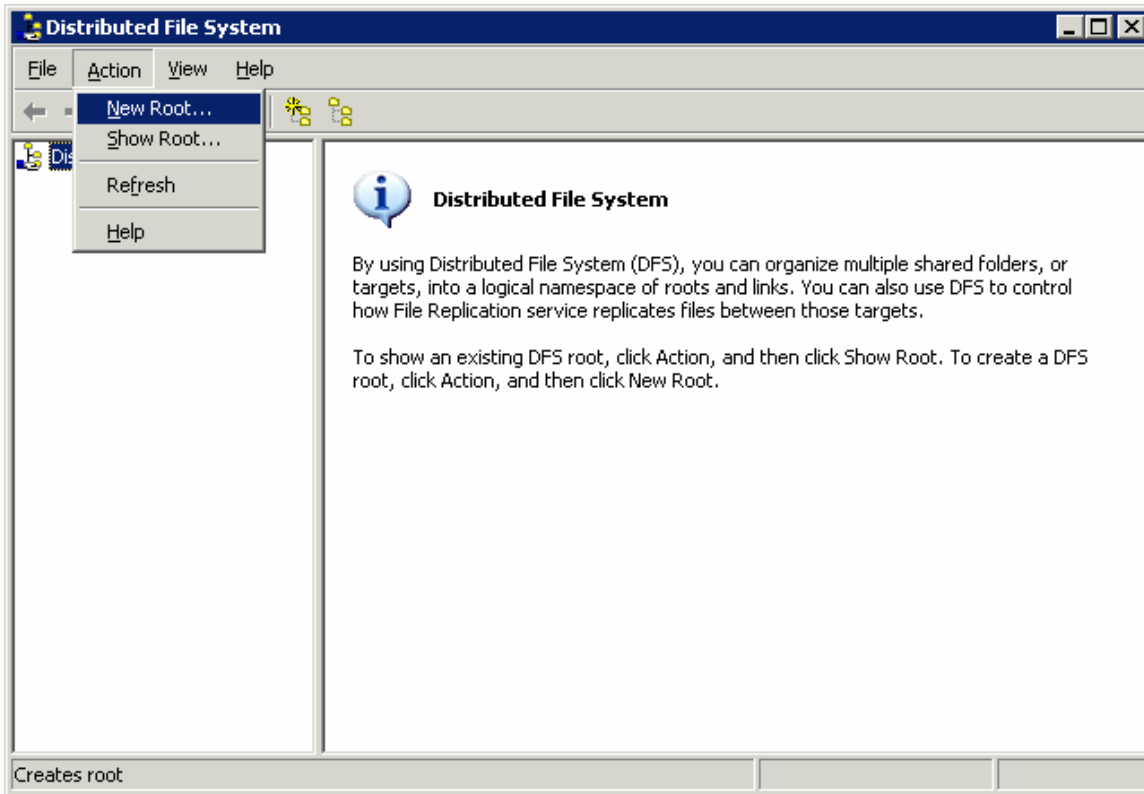
## Step 1: Open the Distributed File System MMC





**Step 2:** Select “New Root” from the Action menu to begin creating a new DFS root

**Note** that unless you are running Windows 2003 Enterprise or Data Centre versions, only one DFS root can exist on a server

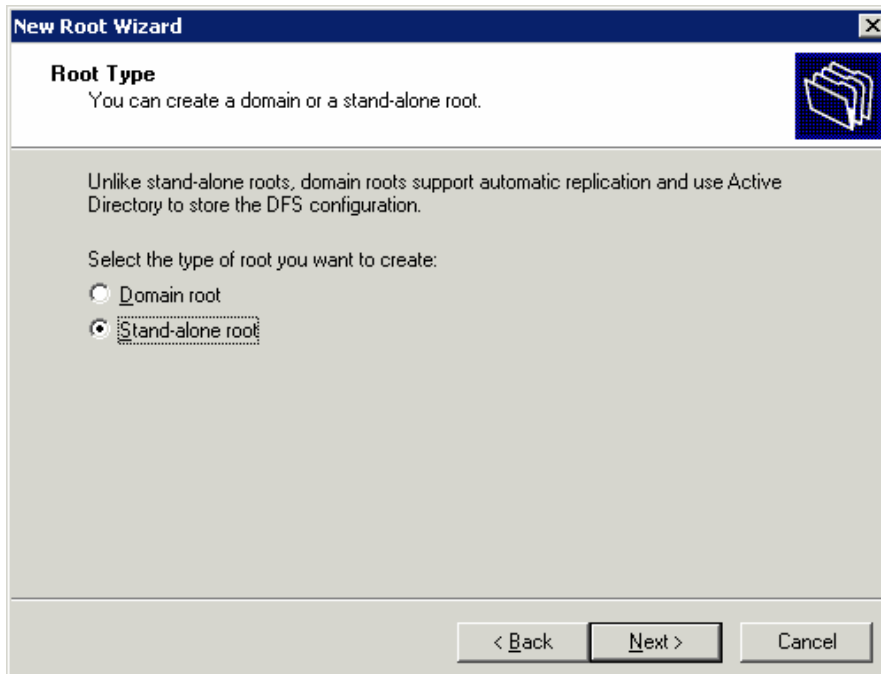




**Step 3:** Click next at the welcome screen

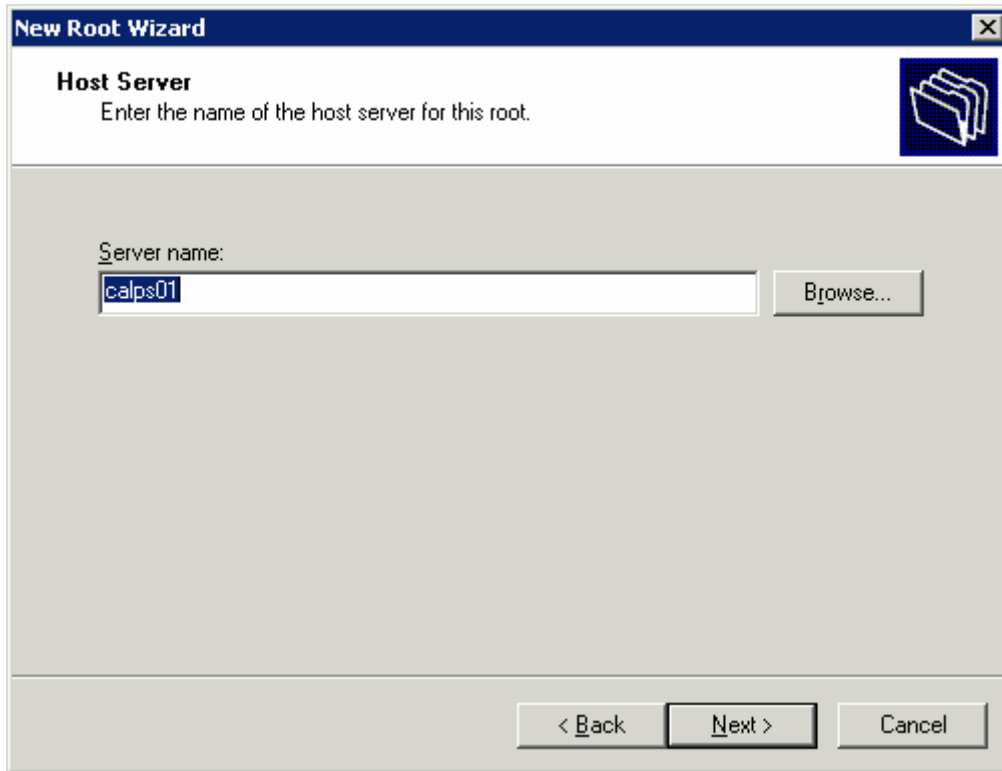


**Step 4:** There are two types of DFS roots that can be created. Unless you intend on having multiple servers host the data or would prefer the DFS configuration to be contained within AD instead of locally on the host server, a stand-alone root will suffice.





**Step 5:** Enter the name of the server that will be hosting the DFS root. This is the server that contains the data you want to share through DFS and is most likely the name of the server you're doing the configuration from.

A screenshot of the "New Root Wizard" dialog box. The title bar reads "New Root Wizard" with a close button. The main area is titled "Host Server" and contains the instruction "Enter the name of the host server for this root." Below this is a text input field labeled "Server name:" containing the text "calps01". To the right of the input field is a "Browse..." button. At the bottom of the dialog are three buttons: "< Back", "Next >", and "Cancel".

**New Root Wizard**

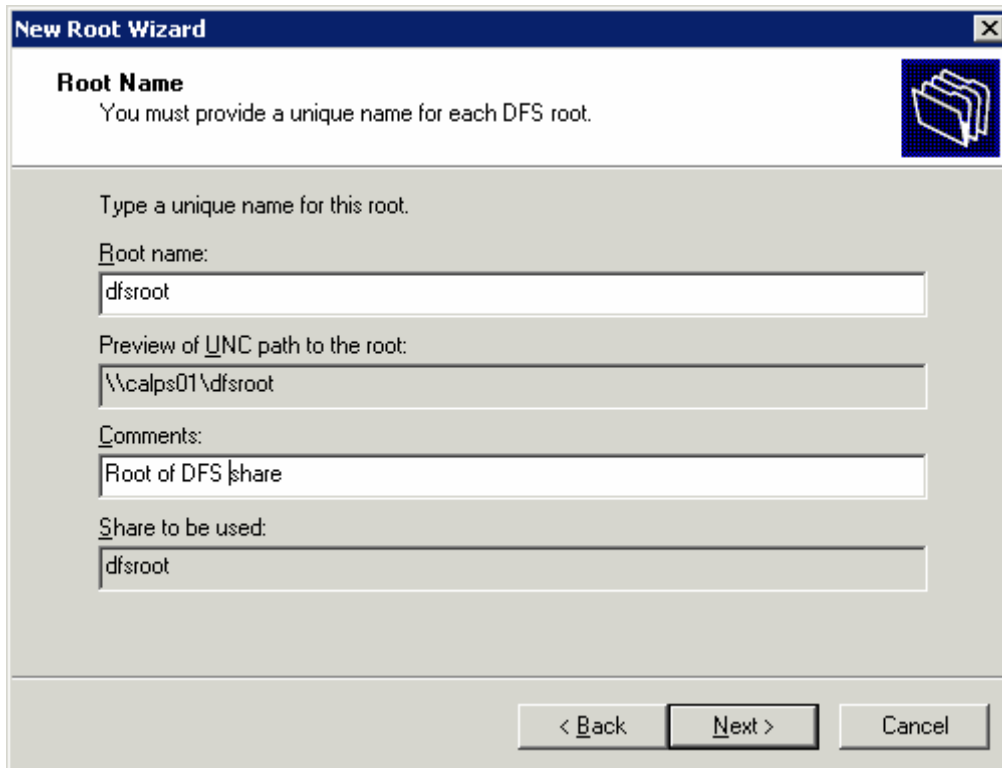
**Host Server**  
Enter the name of the host server for this root.

Server name:

< Back    Next >    Cancel



**Step 6:** Enter the name of the DFS root share. The DFS root and the share name will be the same. If a share by the same name already exists on the server it will automatically be used as shown below, otherwise, you will get a dialog to create a new share to be used by DFS. This extra dialog box can be seen in the screencap for Step 6.

A screenshot of the "New Root Wizard" dialog box. The title bar reads "New Root Wizard" with a close button. The main area is titled "Root Name" and contains the instruction "You must provide a unique name for each DFS root." followed by a folder icon. Below this, it says "Type a unique name for this root." and lists four input fields: "Root name:" with "dfsroot", "Preview of UNC path to the root:" with "\\calps01\dfsroot", "Comments:" with "Root of DFS share", and "Share to be used:" with "dfsroot". At the bottom are three buttons: "< Back", "Next >", and "Cancel".

**New Root Wizard**

**Root Name**  
You must provide a unique name for each DFS root.

Type a unique name for this root.

Root name:  
dfsroot

Preview of UNC path to the root:  
\\calps01\dfsroot

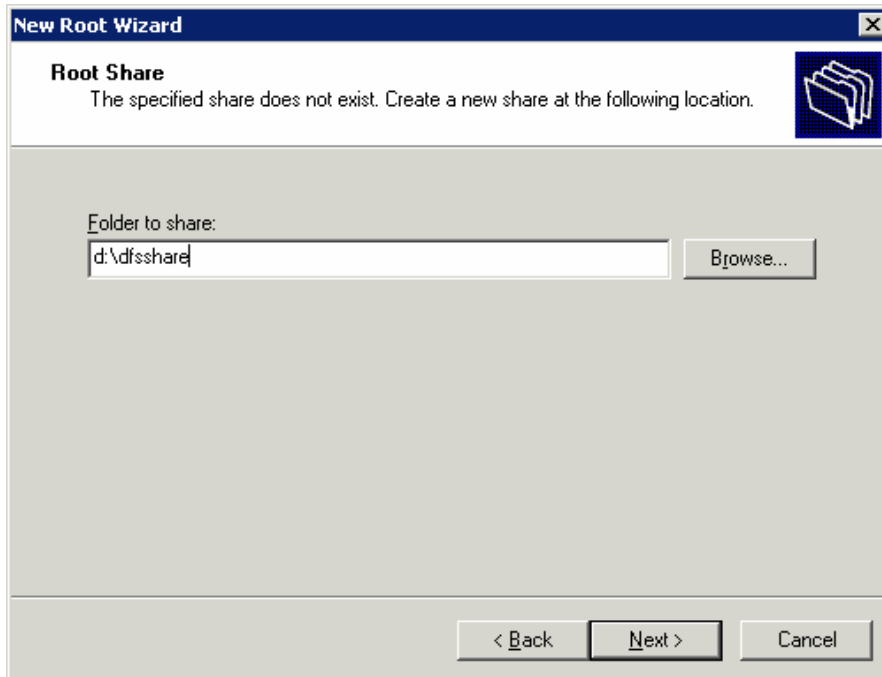
Comments:  
Root of DFS share

Share to be used:  
dfsroot

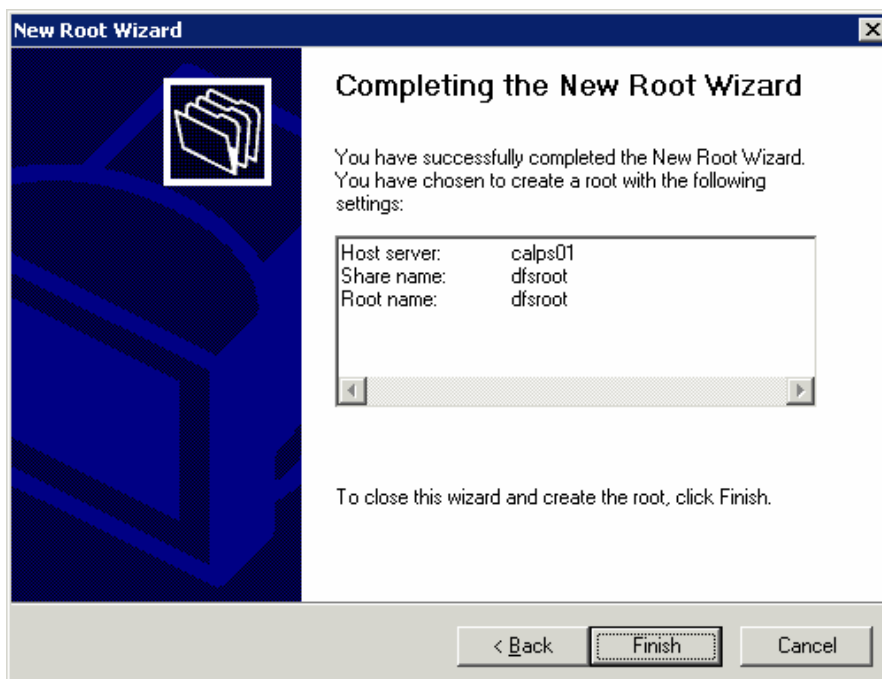
< Back   Next >   Cancel



**Step 7:** If a share does not already exist with the same name as the DFS root you will be prompted to supply the folder to be shared. The share will then automatically be created for you with default permissions.

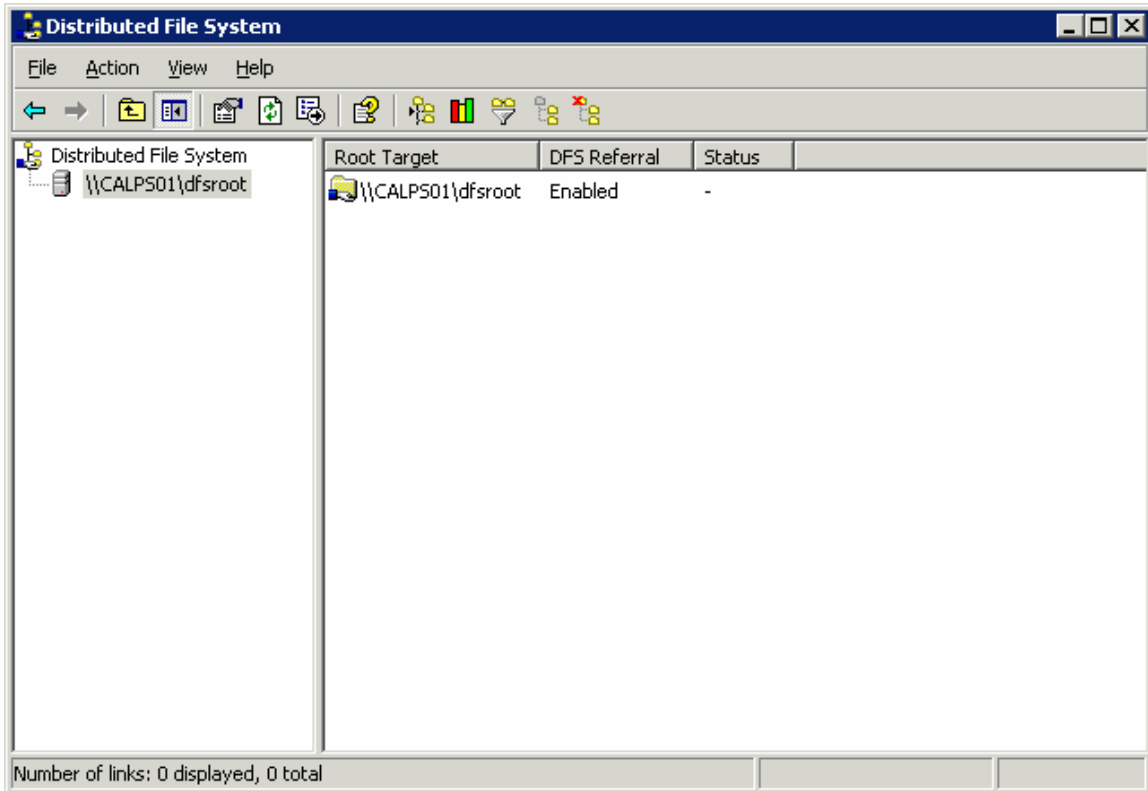


**Step 8:** Select Finish





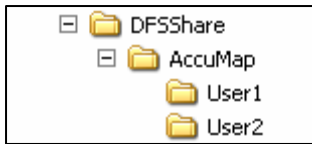
**Step 9:** The new DFS root you've just created will now appear in the console





## Relocating User Top files to the DFS Share

### Recommended Directory Structure for User Data



OR



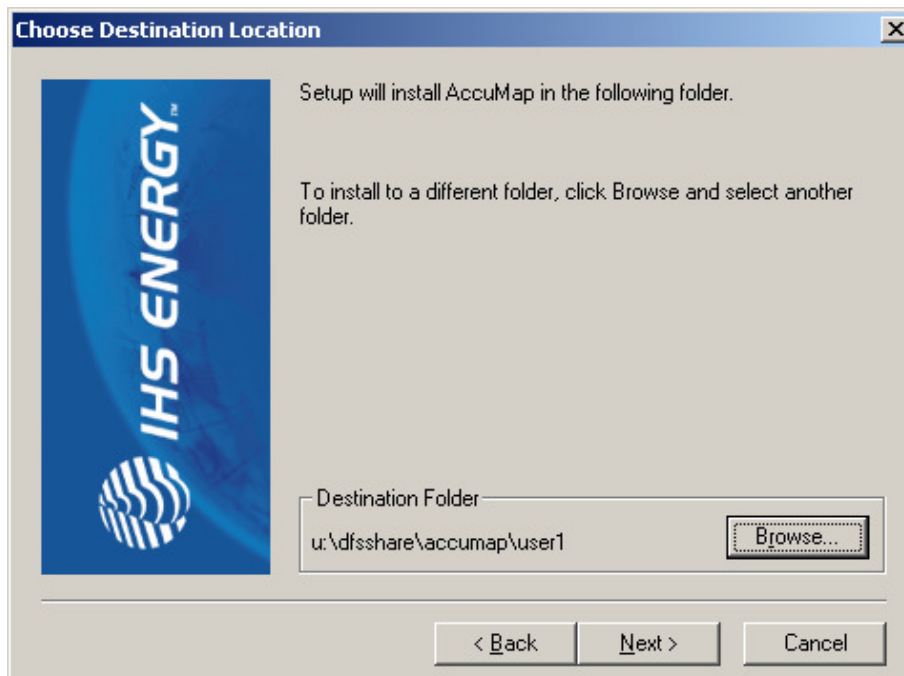
**Important:** Back up the user top files before attempting any of the procedures below. The files are utopa.\*, uwela.\*, and ufatr.\*, as well as any user created files in the same directory.

#### Method 1 (Recommended)

This is the simplest method to implement the new DFS share. To accomplish this, the Administrator must redefine the users existing user directory to point the new DFS share location while keeping the same drive letter and path. This way the application would not have to be changed at all. Copy all user files to the new DFS share.

#### Method 2

This method assumes that the new DFS share will have a different drive letter and or path to the users' tops database files. Run a workstation setup on each computer and specify the new DFS share as the Destination Folder during the install.





## **Distributed File System Web Links**

“Step-by-Step Guide to Distributed File System (Dfs)”

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

“Distributed File System (DFS) How To...”

<http://www.microsoft.com/technet/prodtechnol/windowsserver2003/library/ServerHelp/44b079c1-dc0f-4e46-ada1-f79744694dd5.mspx>

“DFS Technical Reference”

<http://www.microsoft.com/technet/prodtechnol/windowsserver2003/library/TechRef/20ffb860-f802-455c-9ca2-5194f79a9eb4.mspx>

“Distributed File System: Frequently Asked Questions”

<http://www.microsoft.com/windowsserver2003/techinfo/overview/dfsfaq.mspx>