

DFS Configuration and Best Practices

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Windows Distributed File System (DFS)

Windows Distributed File System (DFS) is a technology with which most Windows administrators are already familiar. DFS allows administrators to organize many CIFS shares under a single logical network path. DFS became a standard feature in Windows Server 2003 and has been provided in subsequent Windows Server versions. This document discusses DFS and how DFS can work with the Nasuni Filer.

Overview

In this document, we refer to a “DFS-N”, or a DFS Namespace. A DFS Namespace acts in a manner similar to a Domain Name System (DNS) in that a DFS Namespace allows an administrator to replace complex file, folder, or share management with a simple, easy-to-access pointer. This enables an administrator to make changes to the underlying storage or file system without any disruption of service to end-users.

Also, because DFS works like DNS, DFS can provide failover capabilities. However, Nasuni does not recommend using DFS for automated failover.

In the DFS world, there are three core components:

- **Namespace**
The namespace is the domain-based (recommended) container of all folders that act as reference pointers. Most organizations have one or two namespaces. It is uncommon to see a large number of namespaces within an organization, because this creates needless complexity. There are limited benefits to creating multiple namespaces; a handful of global settings are managed at the namespace level, such as whether or not the namespace is domain-based. If the namespace is domain-based, it means that each Active Directory Domain Controller can act as a router for DFS; in this scenario, DFS is not dependent on a single server acting as a router.
- **Folders**
These are the reference pointers that users access. They are similar to shares in the sense that they are where the client is pointed.
- **Folder Targets**
These are the actual physical targets where the actual data is contained and stored on an actual storage device. A single folder can have multiple folder targets if the folder targets are identical (such as a Nasuni Filer).



Note: This document does not address DFS-Replication (DFS-R). The multiple-site sharing capabilities of Nasuni supersede the requirements for DFS-R file sharing. Contact Nasuni for more detail on Nasuni’s file sharing capability across multiple sites or locations.

An overview of these components appears in Figure 1 below.

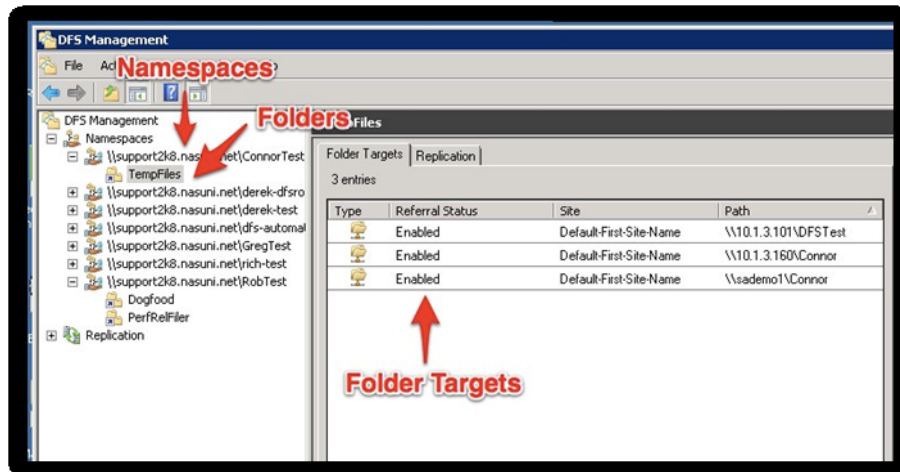


Figure 1: DFS Management View

For a basic DFS setup, you need to create a namespace (which often already exists) and add any new folders to that namespace. Adding each new folder prompts the administrator to connect folder targets, which are the Nasuni instances (covered in the “Configuring DFS with Nasuni” section of this document). This process is quick and should not take more than a few minutes; it takes a bit longer if you have a large number of remote facilities.

Configuring DFS with Sites and Services

In order for the system to connect users to the geographically closest Nasuni Filer, the administrator must take advantage of the Sites and Services feature of Windows Server 2008 (Active Directory). This capability allows the administrator to manage subnets such that Active Directory and DFS know which Site a user is currently visiting, based on their dynamically assigned IP address. DFS then routes a user to the Nasuni Filer in Sites and Services nearest to the user, depending on the user’s IP Address and SubNet (Site).

Active Directory Sites and Services must be configured properly when using the DFS name space. For example, every subnet that users log in to must be defined in Sites and Services; otherwise, the users do not belong to a site, and cannot access any Nasuni Filer. Also, each site must have a Domain Controller for the DFS service to run on that subnet.

To use DFS to set the ordering method for folder targets in folder referrals, follow these steps:

1. Click **Start**, run **Administrative Tools**, and then click **DFS Management**.



2. In the console tree, under the **Namespaces** node, right-click a folder with targets, and then click **Properties**.
3. On the **Referrals** tab, select the “**Exclude targets outside of the client’s site**” check box.

Failing to specify “**Exclude targets outside of the client’s site**” can cause sync errors, missing files, and other issues. DFS should never perform a referral (failover), unless it is specified explicitly. In particular, **Referrals** should never be set to “**Lowest Cost**”.

Most customers have one Nasuni Filer per site listed in Sites and Services. Each site must have an Active Directory Domain Controller and a Nasuni Filer for the **Namespace** → **Referrals** tab to be set to “**Exclude targets outside of the client’s site**”.

You can use the [DFSdiag.exe](#) tool to check your DFS-Namespaces (DFS-N) configuration.

Another benefit of using DFS is that users can use the same `\\host\sharename` no matter which location they are in. They don’t need to know the different names of the Nasuni Filer in order to connect at different locations.



Configuring DFS with Nasuni

Adding the Nasuni Filer to a DFS namespace is a simple exercise. You need a DFS namespace already configured (in this example, “dfs-demo”) and a Nasuni Filer joined to the Active Directory domain.

The next step is to add the desired share from the Nasuni Filer as a folder target. This is the same process you would use to add any CIFS folder target.

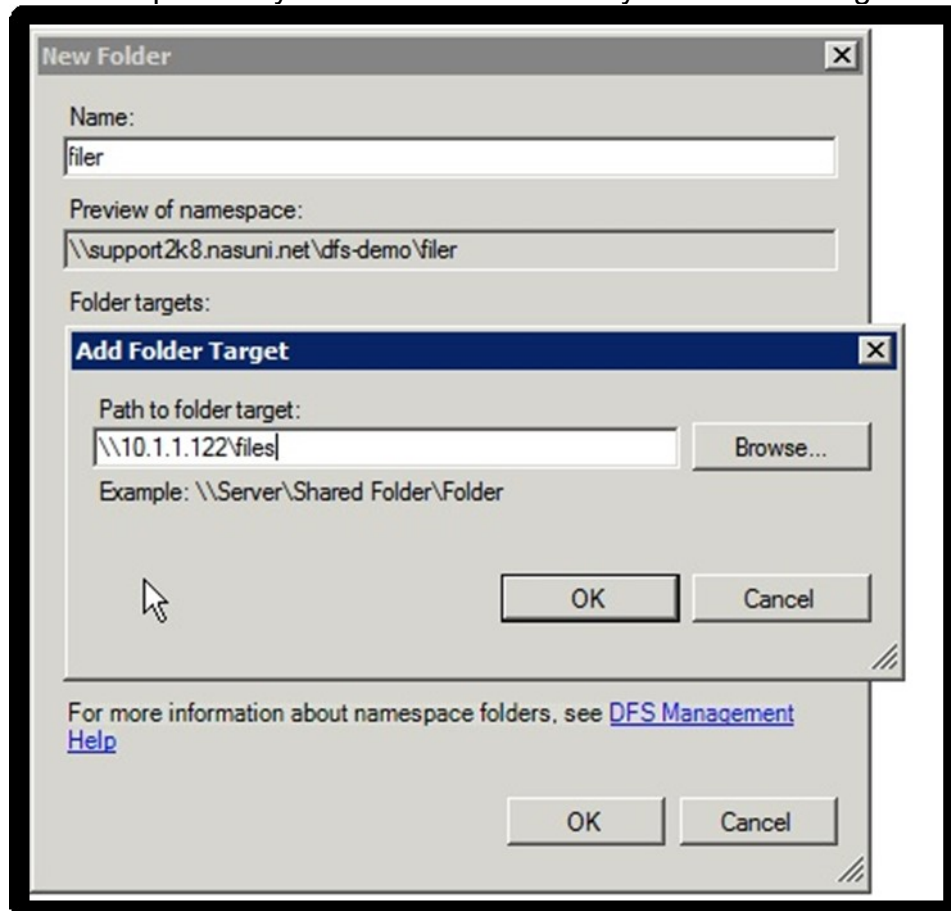


Figure 2: Add desired Nasuni Filer share as a folder target

At this point, client machines within the namespace can easily browse by typing in the address of the new DFS share (in this case, the share configured on the Nasuni Filer). If we then type in the name “dfs-demo”, we see the share residing on the Nasuni Filer.

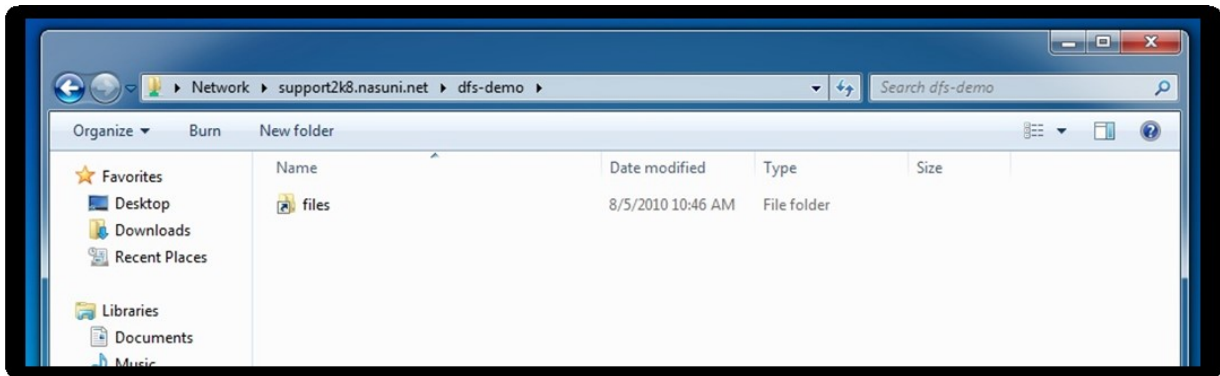


Figure 3: Client view from DFS Share address

By clicking the Share (named “files” in Figure 3), a user can then access the Nasuni Filer share as needed, exposing all existing files and folders that the user has permissions to view and edit.

The following Figure 4 displays a typical view a user would have once they are connected and viewing the Nasuni Filer share.

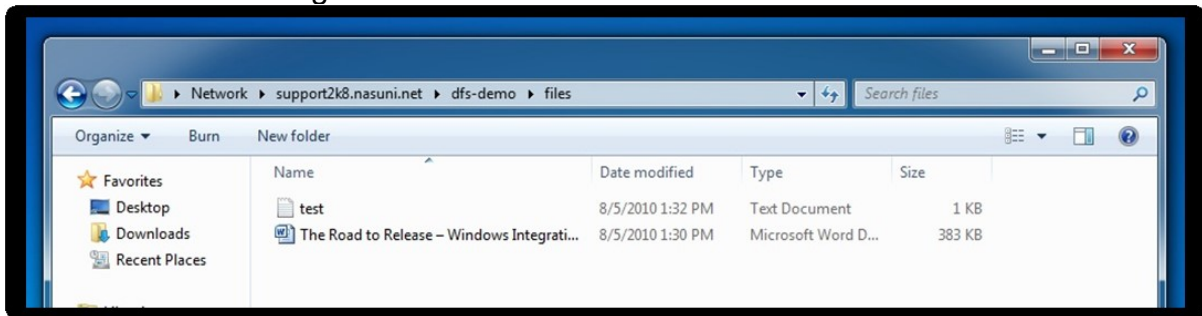


Figure 4: Share access view from client



The following Figure 5 shows how a user could map a Nasuni Filer share (“files”) to our Windows 7 host computer. This is the same method any user would use to map or connect to a network drive or CIFS share. Active Directory controls access to the share and folders to ensure that users have access to only their data. If this were a drive mapping that should reconnect at login or become persistent, the “reconnect at logon” check box would be checked.

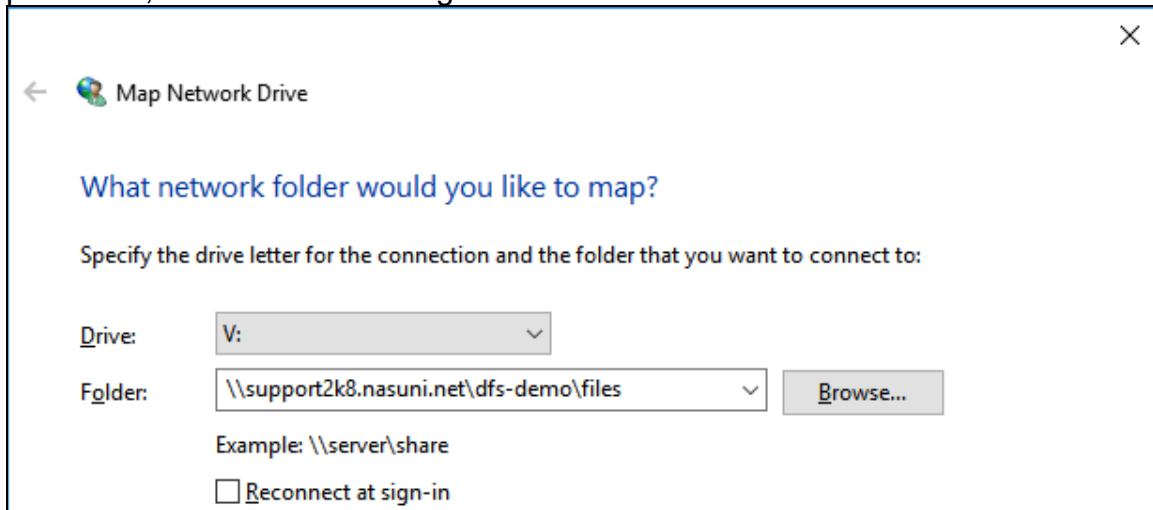


Figure 5: Share mapping from client



Nasuni Filer User Interface

In the Nasuni Filer User Interface, there are several useful tools for configuring and viewing shares, as well as for viewing clients connected to the Nasuni Filer and associated shares. Figure 6 below shows the home screen of the Nasuni Filer with the **Status** drop-down menu to show the “**CIFS Status**” menu selection. The **Status** drop-down menu also allows access to NFS Exports. The **Configuration** drop-down menu provides access to Active Directory settings. The **Volumes** drop-down offers selections for creating CIFS Shares and NFS Exports, as well as other Share-level configuration options.

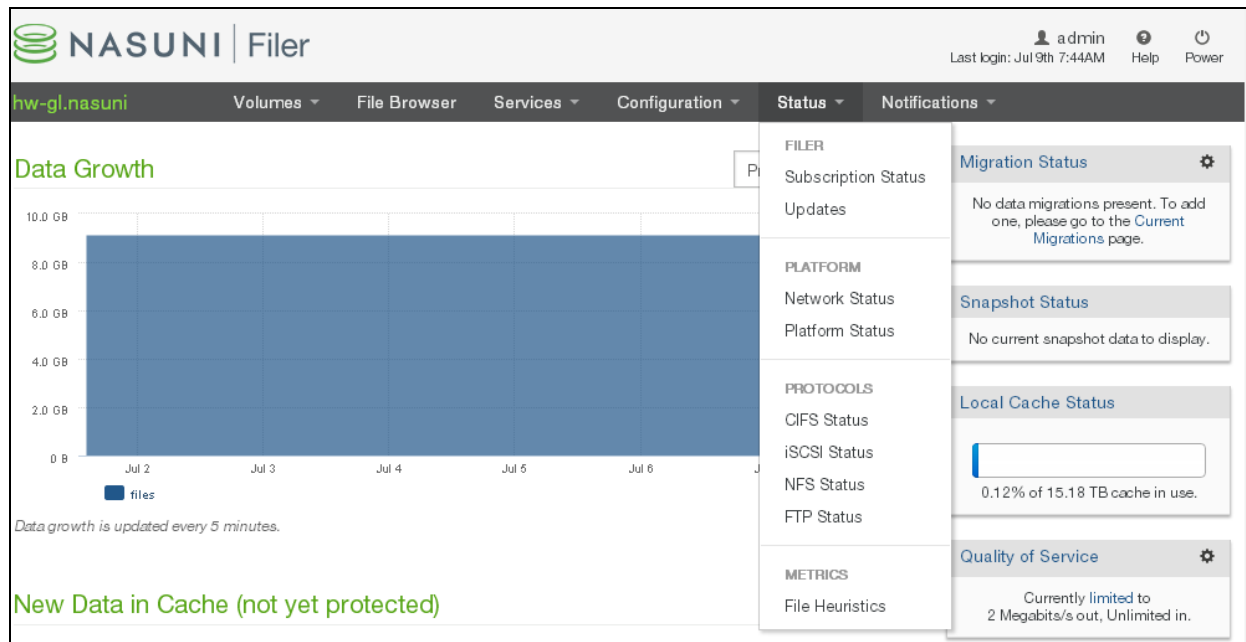


Figure 6: Nasuni Filer GUI CIFS Status menu view



From here, an administrator is able to view all the clients that are actively connected to the Nasuni Filer. This is very useful information if you need to perform Share administration or apply system updates.

CIFS Shares Reset All Clients Reset CIFS Auth Cache

The table below displays all of the CIFS Shares that this filer is currently providing to clients.

VOLUME	PATH IN VOLUME	SHARE NAME
all	\	all
all	\Departments	Departments
builds	\	builds

CIFS Client Status

The table below displays clients currently connected to the Filer through CIFS file sharing. Some of the clients in this list may be idle but are still connected.

SHARE	CLIENT NAME	
all	10.1.0.122	Disconnect
all	10.1.0.198	Disconnect

Open Files & Locks

The table below displays open files and file locks that are currently active.

SHARE	CLIENT	PATH IN SHARE	TYPE
all	10.1.0.198	\Departments	RDONLY
all	10.1.0.198	\Departments	RDONLY

Figure 7: Nasuni Filer GUI CIFS Client Status view

Automatic Failover (Referral)

The use of DFS can potentially be beneficial for all the reasons mentioned above. However, because of the large number of variable conditions that are possible, the use of DFS should be tested extensively before using DFS in a production environment. Possible issues include degraded performance if DFS resolves to distant sources and file conflicts as a result of switching to alternate sources.

For these reasons, Nasuni does not uniformly recommend using DFS for automated failover (referral).



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