

REPLICATION (DFS-R)

DFS-R is a file service that can help administrators control bandwidth issues over a wide area network (WAN). Users accessing files from their local network, or LAN, usually experience limited to no delays. However, lags in viewing files are not uncommon when many users attempt to work with multiple files stored on one or more remote servers.

This offers serious challenges to companies with branch offices due to lost time. Branch office users must access data stored on servers at the company headquarters and, in many instances, users at the home office must retrieve data from their affiliates' servers. A company's bandwidth could find itself coming to a crawl with so many requests for data over the WAN.

In such cases, replicating files using DFS-R can dramatically improve bandwidth bottlenecks and enable employees to use their time more efficiently. DFS-R will replicate data from a remote server to a server on the LAN, providing faster access to files for the users. Further, DFS-R uses remote differential compression (RDC), an intelligent engine for updating files across the WAN. The RDC knows when a file has been edited, revised, or removed, and makes the necessary adjustments on all the replicated servers. If a file needs to be updated, RDC knows to only replicate the changes rather than the whole file.

For low to medium bandwidth WANs, DFS-R can help control bottlenecks by significantly decreasing demand for data stored on remote servers. DFS-R may be implemented without DFS-N to replicate any type of folder among two or more servers. For example, to backup folders across servers or to push information from one server to many others.

Important info: DFS-R is compatible with NTFS formatted disk drives.

REPLICATION EXAMPLE - BRANCH OFFICE

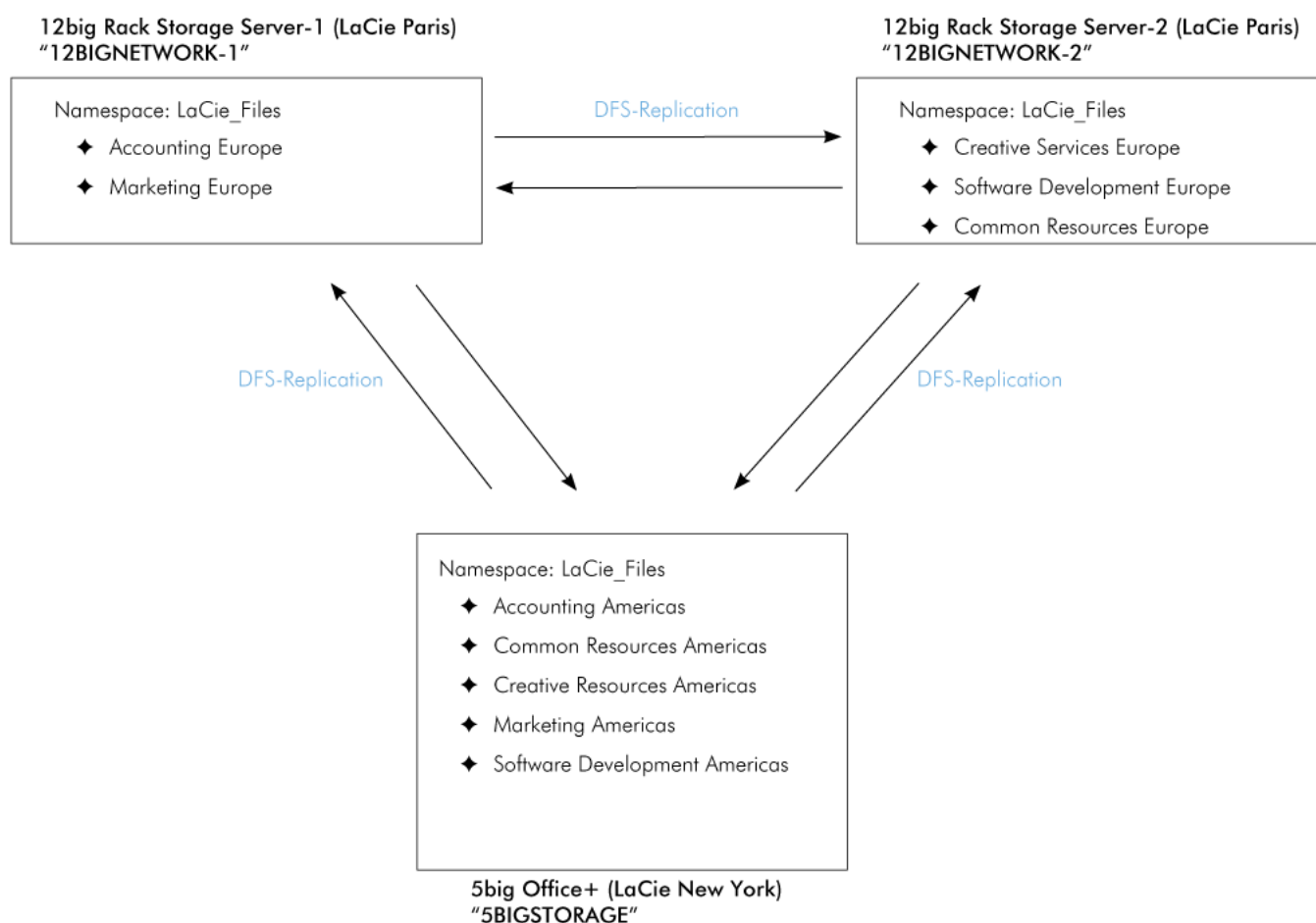
Returning to LaCie, we see that the administrator has created Shared Folders to store the company data. He has also assigned a Namespace for convenient access to data folders. Each user no longer looks for data over a large group of server volumes and Shared Folders.

However, after a few days testing the network, the administrator discovers that employees in New York and Paris are losing valuable time accessing files on remote servers. For example, when an accounting manager in New York wants to see last month's payroll data for Europe, he has to wait due to network bandwidth limitations. This is not the case when reviewing the equivalent file for the Americas stored on his LAN-based server.

By enabling DFS-R on folders, the administrator can replicate data stored on remote servers to LAN-based servers. Since a users's access is prioritized by geography, data will no longer be dragged across the WAN. Instead, files are retrieved from the replicated folders on the LAN. Best of all, the replication is transparent to users since they still see the same Namespace and its contents. The RDC engine works in the background, discovering changes to files and updating them on all the pertinent servers.

Table 04 - Replicating Folders shows a sampling of the folders in the Namespace that will be replicated to the other LaCie professional servers. Now, when the accounting manager in New York looks for last month's payroll data for Europe, the lengthy delay will be gone since the file is replicated on his LAN.

Table 04 - Replicating Folders



DFS-R AS BACKUP

While the primary goal of our example is to improve bandwidth performance, there are other advantages to employing DFS replication. As it turns out, replicating data to other servers is a simple and effective way to configure an automatic backup.

As seen in *Table 04 - Replicating Folders*, folders are replicated across three servers. In the event that one of the servers requires temporary servicing or must be updated, the data will still be available to users due to replication on the other two servers. Further, it is relatively transparent since the DFS-R knows to go to an available server for the requested file(s).

DFS-R AND SIMULTANEOUS FILE SHARING

While DFS-R is perfect for providing local (LAN) access to files stored on remote servers (WAN), users are cautioned when sharing or working on a document within the same period of time. DFS-R does not look to a "master" server that sets the rules on how a file is replicated. Rather, it is more democratic, intuitively updating replicated files in all locations, no matter where the changes occur. If a file is opened on one workstation at LaCie New York and another workstation at LaCie Paris at the same time, DFS-R will replicate the changes from the last user who chooses Save ("last writer wins"). Edits registered just before the last user will go into a folder called "Conflict and Deleted" on one of the servers. Access to the Conflict and Deleted folder is limited to members of the local Administrators group.

On a LAN, a user receives a warning if a file is in use. DFS-R, however, does not search the WAN for replicated versions when a file is opened. This means that users at LaCie Paris and LaCie New York can work on the same accounting spreadsheet at the same time. If LaCie Paris logs changes at 11:02 EST and LaCie New York saves a version at 11:03 EST, the New York version is used by the RDC for replication. The Paris version goes into the Conflict and Deleted folder.

A second potential conflict could arrive when users are not working on a document at the same time but within a period between file replications. For example, the user at LaCie Paris edits a file and saves it. Soon after, the user at LaCie New York opens the same file, makes changes, and saves. If there was no replication during the interval that LaCie Paris and LaCie New York saved their respective files, only the changes made by LaCie New York will be replicated. The changes made by LaCie Paris will be ignored and the file stored in the Conflict and Deleted folder.

An administrator should consider how often files must be simultaneously accessed or revised in a limited period of time. If users will work on replicated files at the same time, there are third-party software solutions for DFS-R to integrate file locking over a WAN.