



# Introducing Microsoft® DFSR Distributed File System Replication

By Q4 2005, Microsoft will have released R2, a refresh and feature enhancement of the Windows® Server 2003 operating system. NSI® Software continues to have a strong collaborative relationship with the Microsoft Storage team and as a Gold Partner will support the latest generation of the Windows Server OS.

The R2 release will be available at an upgrade price and will ship in place of Windows Server 2003 on new systems. Of the many enhancements provided in R2 are upgrades to DFS and what was formally known as FRS, the Windows file replication service. Those familiar with FRS will recall that its functionality has been essentially the same from its introduction in Windows NT 4 through Windows 2003. It is typically used only for stagnant small files such as logon scripts and shared configuration INI's. This is due to the whole file and scheduled nature of FRS. DFSR, originally named FRS2, is a significant improvement over the aged FRS, which begs the question:

## ***Why should I use Double-Take® replication when DFSR is included with Windows Server 2003 R2?***

The short and somewhat flippant retort would be,

## ***Why use a third-party tape backup application when NTBackup is included with Windows Server?***

At the risk of being trivial,

## ***Why pay for Microsoft Word when Notepad and WordPad are both inside Windows?***

The self-explanatory answer is that while Microsoft continues to innovate and create value-add within their core products, they also continue to encourage best-of-breed technologies from their valued software partners like NSI. As in the previous rhetorical examples, while a Microsoft built-in feature may meet the bare minimum needs for a certain class of customer, it is usually recognized that a more robust solution is required to meet the needs for the majority of environments.

This brief is intended to clarify where DFSR may meet the minimum requirements and also identify where Double-Take is a better fit. To better understand this, here is how the two technologies operate:

- Microsoft DFSR works by monitoring when users close their files on the production file server. At that time, the file is cut into varying-sized chunks which are then distilled to a signature and compared against reciprocal chunks of alternate copies of that file. DFSR recursively compares smaller and smaller chunks until the file changes are calculated and then those changes are transmitted.
- Double-Take inserts a driver into the Microsoft file system in the same area as most anti-virus technologies. In real-time, whenever any application makes any write to a file, the actual byte string from the application is captured and transmitted to alternate servers where the same byte-level string is applied to alternate copies in near real time.

Because of the differences in operation, there are requirements as to where one can use DFSR and/or Double-Take.

- DFSR requires Windows Server 2003 R2.
- Double-Take supports replication to/from any Windows NT4, 2000, 2003 and 2003-R2 server. This allows customers to use the technology today, across their entire infrastructure, regardless of what version of Windows Server they may be running.  
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- DFSR requires that the files be closed, which triggers the comparison and eventual transmission events.
- Double-Take supports closed and open files. In the case of applications like SQL Server or Exchange, the data sets are opened at boot-up and never close, which means that DFSR cannot protect business applications. Instead, Double-Take captures every write from Exchange or SQL as they occur and replicates those changes to the target server.  
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- DFSR relies on Microsoft's DFS (Distributed File System) to abstract from the users which server that they are connected to. Then, during an outage, DFS will attempt alternate locations within the DFS structure. This requires deploying DFS throughout the environment and typically changing user mappings at every desktop.
- Double-Take can transparently assume the name, IP and shares of any production server – so the client users automatically reconnect and continue working without any changes to existing customer configurations. In addition, Double-Take can provide this level of failover for applications like Exchange and SQL – something that DFS cannot deliver.  
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- DFSR recursively compares checksums of ever smaller chunks of a file to determine what has changed, after the fact. This results in additional CPU load on the production servers.
- Double-Take captures the byte-level changes as they occur and immediately sends them across the network. The result is negligible processor impact and no additional disk load.

Where DFSR 1.0 is built on “lessons learned” from FRS, Double-Take 4.4 is built on over ten years of replication experience. In addition, Double-Take also includes:

- Robust management, including notification of events and information thru SNMP, as well as PerfMon, EventLog and dedicated consoles.
- Bandwidth management, based on time of day, size of data, etc.
- Intelligent compression including three levels of algorithms, minimum file sizes, comparative logic for truly smaller payloads, and file-extension awareness for optimum transmission.

### **Closing Comment**

NSI Software, maker of Double-Take and GeoCluster<sup>®</sup>, has been a launch partner of every Windows server storage product since the original Windows Powered NAS (aka Storage Server) launch. As a Microsoft Gold partner whose products are consistently logo certified to the highest standard (Windows 2003 Server, Enterprise, and DataCenter), NSI continues to have a long and healthy partnership in supporting the Microsoft Windows server platform, critical business applications like SQL and Exchange, and advances in Windows Storage.

NSI has over 55,000 licenses in production, including 13,000 on Exchange and 15,000 on SQL Server, making it the undisputed leader in protecting Microsoft environments through replication. Our technology is available through Dell, IBM, SunGard, HP and the traditional Microsoft reseller channel.

We hope that you have found this information useful and please let your NSI representative know if you have further questions on this or other replication topics – or contact [MicrosoftTeam@nsisoftware.com](mailto:MicrosoftTeam@nsisoftware.com).

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