



Packeteer Wide Area File Services

Enabling Real-time File Collaboration With Microsoft Office Across the WAN

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Microsoft Office Across the WAN

The Wide Area Wait

It's clear to anyone who's ever attempted to share or access a Microsoft Office Excel, PowerPoint® or Word® document across the Wide Area Network that Microsoft Office applications just don't "travel" well across the WAN. That's because Microsoft designed these applications and their related protocols for use on PCs and Local Area Networks where latency and file transfer times are not an issue.

The problem is that most of us use Microsoft Office for just about everything we do, which means that most of us — at one time or another — need to transfer, share, and save Microsoft Office files across the WAN. And that often translates into a frustrating "Wide Area Wait".

Slow, Unreliable File Access and Saves

These days, we've come to expect super-fast access to data and files across our Local Area Networks. We also have increased confidence that the work we back up from our desktops to centralized LAN storage will be safe and accessible to others on our teams. We have come to rely on our LANs as a broadband highway, a safety net and a collaboration tool all rolled into one.

Our work with Microsoft Office files has only intensified our expectations and reliance on the LAN. There's a whole spectrum of activities associated with Microsoft Office that requires interaction and collaboration based on LAN file-sharing capabilities. Forecasts are shared through Excel spreadsheets, Word proposals are prepared and edited by multiple team members, and marketing presentations are built using PowerPoint and shared and revised by people throughout the entire local enterprise. Our ability to work with Microsoft Office documents across the LAN in this way is now more than just an expectation, it has become a necessity of our working lives.

A problem arises, however, when your main office also happens to be one of your company's remote offices. Millions of us work in enterprises that conduct business across many distributed locations — sales offices, manufacturing plants, R&D facilities, and distribution centers — the list goes on. These offices are essentially cut off from real-time access to files in their company's data center and dependent on the WAN for all data center file access and collaboration. Opening and saving are often too slow to even consider.

Latency and Chattiness: Okay on the LAN, bad on the WAN

The Microsoft Office protocol that moves files across networks is called CIFS (Common Internet File System). Because CIFS was designed to run across a LAN — not the WAN — its "chatty" nature is negatively affected by WAN latency. Microsoft Office users attempting to work directly with files over the WAN have to deal with unacceptable wait times. That's just the way it's been.

Further aggravating this Microsoft Office/WAN dilemma are some of the inherent download and file saving characteristics of Microsoft Office applications. One example of this is how Word displays a page-at-a-time, and doesn't "fetch" the next page until it is called for by the user. Another example is the numerous temporary files that Microsoft Office applications create and save in the normal course of file saving operations, further consuming enormous amounts of bandwidth and time.



The expectation and requirement to share and collaborate on Microsoft Office (and other) files in real time in these distributed environments is not diminished — if anything, the need to share files between remote offices is growing every year. When your office is a remote office and you need to share Microsoft Office documents with other locations, you have two problems: you're at the mercy of WAN latencies and instabilities and at the mercy of Microsoft Office performance in a WAN environment.

Workarounds Abound

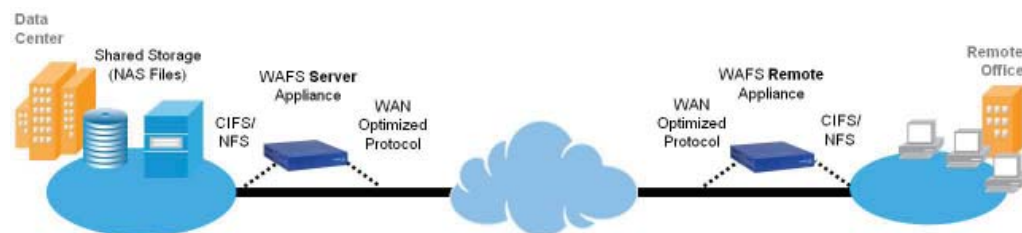
In an attempt to limit some of this Microsoft Office wide area file sharing frustration, many companies have implemented workarounds. The most common of these is replication, whereby files are duplicated to remote office storage via special software, file transfer or e-mail. This approach, however, is fraught with challenges and increased costs. The duplicate storage needed in a remote office for replication creates hardware and software expenses. Even more substantial are the increased total cost of ownership and personnel required to care for these remote office file servers. Once you factor in replicated files that are immediately out of sync with central office information, and remote office backups that may be overlooked or not get done at all, a replication workaround seems to only compound the inherent Microsoft Office file sharing issues.

Packeteer Wide Area File Services

The Sum Is Greater Than the Parts

Wide Area File Services (WAFS) technology is a remote office IT file sharing and storage consolidation solution that alleviates Microsoft Office WAN latency issues and frustrations and the resulting workarounds by meeting them head on. Best-in-breed WAFS solutions skillfully combine multiple techniques to allow users to access and save Microsoft Office documents across the WAN at LAN-like speeds.

As the market leader in this field, Packeteer's WAFS solution — **iShared** — incorporates a patented WAN optimized protocol and WAFS Transport Acceleration and Data Reduction functionality. These technologies work in concert to dramatically reduce Microsoft Office WAN file sharing and saving time.



The combination of a WAN optimized protocol providing WAFS Transport Acceleration form a solution that is greater than the sum of its parts:

File-Aware Caching

Changes to Microsoft Office files characteristically cause the whole file to be written back to data center storage. With file-aware caching, once a file is cached in a Packeteer appliance at the branch, only subsequent changes to the file data are compressed and streamed back to data center storage. The result is a dramatic, order-of-magnitude reduction in data transmission and the time it takes to save a file over the WAN.

Dictionary-Based Compression

Microsoft Office documents are typically accessed in blocks of data (“a page-at-a-time”), slowing the transfer of files across the WAN. Compression extracts redundancies in the data, so that less data moves across the WAN. This reduces the time it takes to access data across the WAN, while eliminating unnecessary data traffic.

Temporary File Optimization

The sheer number of temporary files created by Microsoft Office applications in the normal course of its operations significantly adds to the amount of time it takes to access and save Microsoft Office files over the WAN. Packeteer iShared recognizes temporary files and by intelligent handling those files reduces the amount of data sent, significantly improving WAN performance.

WAFS Transport Acceleration

Microsoft Office applications operate independently as they save information back to central storage. WAFS Transport Acceleration slashes additional performance-killing round-trips over the WAN by aggregating data across applications and even across multiple remote office users before saving these changes back to central storage. The result is more data sent in fewer trips and less WAN waiting time.

With one Packeteer appliance in a data center and an appliance at any remote office, enterprises have access to a comprehensive, multi-layered solution that dramatically reduces the effect of WAN latency while creating a coherent, global Microsoft Office file serving and sharing environment. All with no new user or datacenter software needed. All with no changes in the way users work with Microsoft Office.

The result is that distributed enterprises are now able to build the virtual worldwide LAN that WAN-based Microsoft Office users really need. Enterprise IT managers are empowered with a solution that frees bandwidth, consolidates storage, and reduces administrative costs. And Microsoft Office users are able to work with Microsoft Office files from anywhere in the world.

Accelerating Performance of Key Applications

Below are three examples of Packeteer's performance based on iShared appliances that are in operation in enterprises in various parts of the world. The time in seconds shows how Packeteer's solutions dramatically reduce Microsoft Office Word, Excel and PowerPoint file access and write-over times in real-world environments.

Example 1: Fortune 500 Corporation — MS Office results between Denmark and New Jersey, USA

Part 1 — Bandwidth: 413 Kbps, Latency: 140 ms

| File Type & Size | Access over WAN without Packeteer | Access over WAN with Packeteer "cold" | Access over WAN with Packeteer "warm" | Write over WAN without Packeteer | Write over WAN with Packeteer |
|------------------|-----------------------------------|---------------------------------------|---------------------------------------|----------------------------------|-------------------------------|
| .doc / 645 KB | 45 | 11 | 3 | 115 | 6 |
| .xls / 3488 KB | 160 | 13 | 3 | 246 | 12 |
| .doc / 2878 KB | 78 | 35 | 3 | 468 | 8 |
| .doc / 1671 KB | 58 | 21 | 3 | 318 | 6 |
| .doc / 19 KB | 36 | 3 | 3 | 46 | 6 |
| .xls / 14 KB | 41 | 4 | 3 | 39 | 13 |



Part 2 — Bandwidth: 256 Kbps (per subscription), Latency: 900 ms
(the same data run over the company's satellite link)

| File Type & Size | Access over WAN without Packeteer | Access over WAN with Packeteer "cold" | Access over WAN with Packeteer "warm" | Write over WAN without Packeteer | Write over WAN with Packeteer |
|------------------|-----------------------------------|---------------------------------------|---------------------------------------|----------------------------------|-------------------------------|
| .doc / 645 KB | > 550 | 50 | 12 | 872 | 29 |
| .xls / 3488 KB | DNC* | 55 | 13 | DNC | 60 |
| .doc / 2878 KB | DNC | 160 | 20 | DNC | 36 |
| .doc / 1671 KB | DNC | 101 | 16 | DNC | 40 |
| .doc / 19 KB | > 300 | 28 | 16 | 364 | 38 |
| .xls / 14 KB | 400 | 25 | 16 | 325 | 70 |

*DNC = Did Not Complete

Example 2: Large Insurance Company — Word files between Philadelphia, PA, USA and Roswell, GA, USA

Bandwidth: T1 (1.544 Mbps), Latency: ~75 ms

| File Type & Size | Access over WAN without Packeteer | Access over WAN with Packeteer "cold" | Access over WAN with Packeteer "warm" | Write over WAN without Packeteer | Write over WAN with Packeteer |
|------------------|-----------------------------------|---------------------------------------|---------------------------------------|----------------------------------|-------------------------------|
| .doc / 145 KB | 90 | N/A | 6 | 175 | 13 |
| .doc / 195 KB | 57 | N/A | 4 | 207 | 7 |
| .doc / 34 KB | 90 | N/A | 5 | 140 | 5 |
| .doc / 1055 KB | 125 | N/A | 10 | 360 | 28 |
| .doc / 170 KB | 90 | N/A | 7 | 190 | 7 |
| TOTAL | 7m 32s | 4 | 32s | 17m 52s | 1m |

Example 3: Retail Organization — MS Office files between New Jersey, USA and Hong Kong

Bandwidth: 232 Kbps, Latency: ~280 ms

| File Type & Size | Access over WAN without Packeteer | Access over WAN with Packeteer "cold" | Access over WAN with Packeteer "warm" | Write over WAN without Packeteer | Write over WAN with Packeteer |
|------------------------|-----------------------------------|---------------------------------------|---------------------------------------|----------------------------------|-------------------------------|
| .doc / 24 KB (drawing) | 54 | 15 | 14 | 55 | 10 |
| .doc / 160 KB (tables) | 122 | 18 | 10 | 69 | 10 |
| .doc / 79 KB | 60 | 18 | 11 | 75 | 11 |
| .xls / 319 KB | 40 | 15 | 9 | 43 | 11 |
| .xls / 1.25 MB | > 180 | 25 | 13 | 82 | 9 |
| .ppt / 3 MB | > 150 | 100 | 13 | 166 | 9 |

Note: Due to document content, network conditions, ability to compress the file, amount of information written and other variables, results are not always linear. Also note that "cold" signifies first time access to a file, while "warm" signifies subsequent accesses to the same file.



Compliance, Integrity and Control

Faster access and save times across the WAN may be the goal for Microsoft Office users in a distributed environment, but it's not the only thing an enterprise must keep in mind when deploying a solution that achieves these results. No WAFS solution that optimizes Microsoft Office files for transfer across the WAN can be considered truly effective unless it also offers features that maximize performance, security, and reliability. Packeteer's all-in-one WAFS solution builds in added features that ensure an unmatched level of data protection along with the LAN-like access it provides. This gives both users and enterprise IT professionals the assurance that the Microsoft Office files they are now rapidly accessing and saving across the WAN are safe and consistent as well.

By adding a pre-population feature to all its remote office appliances, Packeteer ensures maximum accessibility and speed for "cold" downloads by allowing files to be pre-stored in that remote office. These files can either be "pushed" from the Data Center or "pulled" by the remote appliance itself, guaranteeing access to the most recent updates whenever they are needed.

This means that a set of revised Excel forecast spreadsheets can be automatically pushed at 4 a.m. to a company's remote sales offices worldwide for immediate access when their employees arrive at those remote offices at 8 a.m. The changes are fresh. The data is consistent company-wide. And company employees have access to the data they need.

Additionally, to ensure that all Microsoft Office files running through a network of its WAFS appliances are safe and secure, the Packeteer iShared solution is packaged with features that allow for state-of-the-art caching and logging of all updates and writes to persistent storage. The resulting product automatically survives WAN disruptions and guarantees 100 percent data coherency and consistency through an internally managed file locking system. This system prevents multiple users from obtaining read/write access to the same file at the same time, transforming Microsoft Office file locking mechanisms that are not "WAN-safe" to enable "LAN-safe" Microsoft Office file access throughout the network.

Packeteer's market leadership is built on products that help successful businesses securely accelerate, consolidate and control information at every location across the WAN.

Let our iShared WAFS solution help you dramatically improve file access performance for branch locations and consolidate servers with confidence. Dramatically faster file transfers and saves plus the assurance that this data will be secure and reliable is making this best-in-breed WAFS technology an indispensable tool for tens of thousands of remote users throughout the world. The movement towards using WAFS technology to optimize Microsoft Office files for the Wide Area Network is entering the mainstream, gaining momentum with all types of distributed enterprises in all industries that need to once and for all end the "Wide Area Wait."

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