

Wide Area File Services: Document Collaboration for the Distributed Business Environment

The days of having everyone on a project together in the same office have long passed. To expand global reach and maintain a competitive advantage, many businesses have offices and operations distributed around the globe, or participate with multiple partners on larger projects.

As the work environment becomes increasingly distributed, businesses need to collaborate in real time on large, critical documents with distant colleagues and partners. Individuals in multiple locations need to work with the same spreadsheets, CAD drawings, or MRI images, without frustrating slowness, costly delays, consistency errors, or versioning problems.

Relying on person-to-person file transfers or email attachments between users is risky for essential business processes and cumbersome for users. IT organizations want to have a way to enable users to collaborate on documents across wide area networks (WANs) as if they were local, while maintaining the integrity and availability of essential files.

IT organizations must decide how best to address this problem. For example, network equipment vendors push the benefits of WAN-optimization appliances, which promise to solve a wide range of problems. But these appliances do not deliver the best results for sharing large files, or sharing files with the frequent access typical of active collaboration.

This paper outlines the essential requirements for file sharing across WANs; briefly discusses the limitations of appliance-based WAN optimization when applied specifically to document collaboration; and describes how GlobalSCAPE Wide Area File Services (WAFS), a software-based file replication solution, enables secure and reliable collaboration across WANs with the performance of local file sharing.

File Replication and Collaboration Requirement: The Essentials

The essential first step in any solution analysis is to determine what you really need to support collaboration across locations. The most common requirements include:

Feature	Business need
Real-time file replication	Collaborate with people at multiple locations across WAN
Fast file access	Optimize productivity, reduce delays, and minimize frustration
Absolute file integrity/file locking	<ul style="list-style-type: none">• Everyone should see the most recent version• No one should inadvertently overwrite someone else's work• Previous versions should be easily available
Transparency to users	Users do not need special training or tools to collaborate

Feature	Business need
Centralized backup and management	Businesses can manage files and backups in a central location
Resiliency	When one location is offline, other locations should be able to work with the shared files, without worrying about discrepancies
Minimal infrastructure impact	<ul style="list-style-type: none">• Reduce bandwidth requirements• Low capital expenditure
Minimal IT personnel involvement	<ul style="list-style-type: none">• IT personnel should not be "middle men" involved in file transfer• Minimize management effort; the system should be easy to install/maintain
Transit security	Data in transit over WAN should be encrypted for security

Some of these requirements are more important to your business than others. Consider, for example, the case of building/engineering organizations that collaborate with partners, internal groups, and clients on very large design files. For these businesses, the most critical requirements are fast access (because time is money) and absolute file integrity (because errors can be disastrous).

Limitations of Appliance-Based Accelerators

Appliance-based WAN accelerators promise to provide fast access to three types of resources over WAN connections: files, applications, and databases. If file sharing is your main concern, however, appliance-based optimization falls short, for several reasons:

- Poor performance for large or frequently-changing files. Every request to open a file generates a request to the appliance, which must check to see if another user has opened or changed the file. If the file has changed, the edited file is sent across the WAN. Because the file is updated as a user asks for it, file requests create traffic that combines with latency to delay access to the files. The more users accessing the file and the larger the file, the more network traffic and the greater the latency.
- Appliance-based bottlenecks. These appliances sit directly in the data path, adding overhead for each transaction. In addition, appliances must encrypt and decrypt data in transit, imposing an overhead and delay on every transaction.
- File integrity concerns. When one site is off the WAN for any reason, the use of local caching increases the risk of remote users getting out-of-date files.

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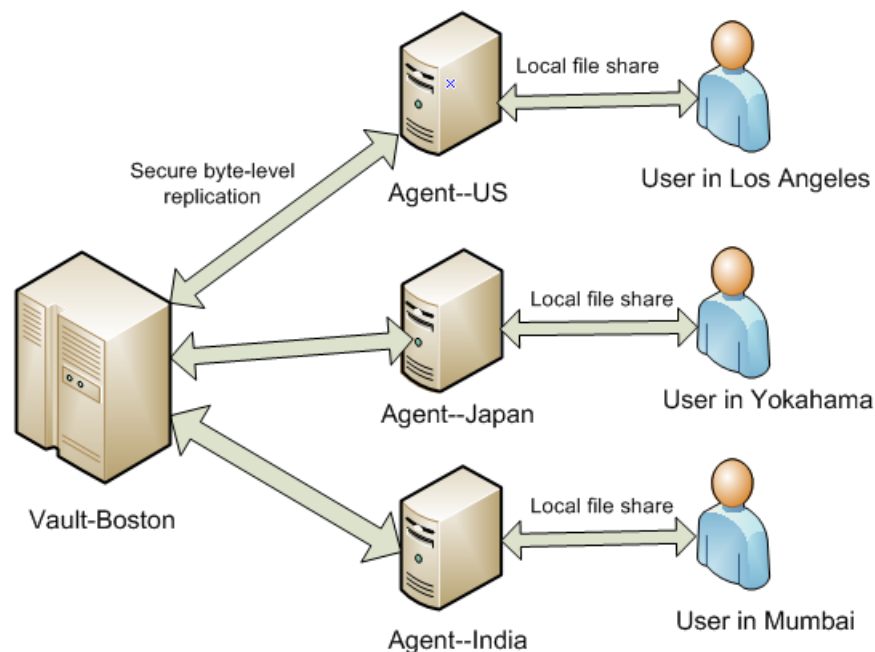
Such applications often transfer the temporary and unneeded system files created by the operating system, in addition to the working file. If you measure the traffic, you see that they actually send more bits than the original file size. In short, an appliance-based WAN accelerator is not optimized to support file sharing across long distances, particularly for large files or files with frequent updates. Accelerators are targeted for LAN-based deployments—using it on the WAN was an afterthought.

In addition, these hardware solutions are often much more expensive than software-only solutions, typically requiring an appliance on both ends of the connection, making collaboration with partners more challenging.

GlobalSCAPE WAFS: A Software-Based Approach to File Replication

GlobalSCAPE WAFS is a software solution that provides file sharing across multiple locations, at speeds approaching local area network performance. It works over HTTP or HTTPS and requires no special firewall configuration. A VPN is not necessary. Systems can be located anywhere using any connection, at any distance. WAFS customers share data and consolidate backups across continents.

WAFS' master repository (aptly named the "Vault") maintains the most current image of all files for centralized management (backups, snapshots, recoveries, etc.) and also maintains past versions of files, deleted files, and any snapshots created for backup.



The server communicates with an "agent" at each location. When a user requests a file, the files open locally, from the local server, every time the file is accessed, no matter how often, where, or when it was changed. The local agent always provides the most current version of the file, and locks it down so multiple users cannot make changes at the same time.

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File Replication and Collaboration in Action

When a user in one location opens a shared file for updating, WAFS prevents other users from updating the file. Others can continue to view the file, but file locking eliminates the chances of users overwriting each other's work or introducing errors through collaboration. With WAFS, there are no stale versions of files. When you open a file, you are guaranteed that it is the most recent.



Would you like to rollback a document to its state two weeks or two hours ago? Would you like to retrieve a file that was deleted a month ago? WAFS can automatically keep past versions of each file and a previous version can be made current with a single click. A user with the proper privileges can use a browser to securely access file versions from any location—no tapes to pull. WAFS can also keep scheduled point-in-time snapshots with expiration and overwrite settings if you need to rebuild an entire directory.

When a user updates and then saves a file, WAFS sends only the file differences—which are encrypted—to the distributed locations, not the entire file, temporary files, or unneeded system files created by the operating system.

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Sending only these "byte-level" differences minimizes the bandwidth requirements and delivers high-performance file access. WAFS also uses bandwidth-throttling to eliminate network chatter, and dynamically changes packet size and other parameters to ensure optimum performance and speed.

When one office is offline or disconnected from the WAN, everyone can continue to work with the shared files. WAFS switches automatically from online to offline mode and back, if the network (or any resource) is down. In offline mode, the data is still fully accessible locally and changes are recorded. When the offline office rejoins the network, WAFS automatically detects any potential file conflicts (from multiple file updates happening during the outage). On other systems, file replication can be missed forever if a system goes offline.

WAFS scales to support any data set, any number of users per site, and any number of sites. For continuous backup, you can configure many remote servers to use the same central backup server. On other systems, data sharing between sites often requires multidirectional data transfer among every site. Rather than multiple sites simply broadcasting to each other, WAFS fully supports real-time, 24 x 7, multi-directional sharing between any number of sites, with any number of files and any file size, with data coherence.

From the user's perspective, WAFS delivers immediate benefits, including:

- File access is fast; no waiting for long file loads
- No special training is required to use it; you do not need to learn a new interface
- File locking defends against versioning errors

Users and applications change absolutely nothing; users access the files the same way, such as in Windows Explorer, a Web browser, or an **Open** or **Save As** dialog box. You do not need to change user profiles, you do not need to change users' desktops, and users don't need to memorize yet another password. You just select the folders on the various fileservers at the different sites, share the folders over the LAN, and leave all permissions and sharing exactly the same as before.

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From the business perspective, WAFS is a straightforward and secure way to manage file sharing over distances:

- The central server supports snapshots and continuous backup for business continuity.
- Installation is easy and non-intrusive to the network.
- Management is simple, with a low total cost of ownership.
- Bandwidth requirements are minimized because only the changes to the file are uploaded to the server, not the entire file.

WAFS does not need an appliance that requires hours of setup by skilled technicians and reconfiguration of user connections. It does not have to involve writing scripts or navigating complex dialog boxes. With WAFS, deployment takes 5 minutes per site and can be done remotely. It sets up and fully deploys on your existing Windows server, and the software download is small. Local and network storage is fully supported to grow with your data needs.

WAFS is a proven, tested solution that is widely deployed in a range of businesses that require long-distance collaboration, including architecture, engineering, and construction firms. WAFS also supports Autodesk® Revit® worksharing capabilities, enabling multisite collaboration on Building Information Management modeling.

Summary

To optimize business productivity and reduce costs when collaborating over distances, IT organizations need to give users high-performance, easy-to-use methods for document collaboration, as if they were working with local colleagues. In addition, to protect business interests, they need to ensure that these solutions support centralized management and backup, prevent versioning or integrity errors, and do not impede network traffic.

GlobalSCAPE WAFS meets all of these needs, offering a low-overhead file-replication solution that is transparent to users. Companies that use WAFS achieve a significant reduction in bandwidth coupled with significant time savings compared to other file sharing methods.

About GlobalSCAPE

GlobalSCAPE, Inc. (NYSE Amex: GSB), headquartered in San Antonio, TX, is a leading provider of secure information exchange solutions. Since the release of CuteFTP in 1996, GlobalSCAPE's solutions have continued to evolve to meet the business and technology needs of an increasingly interconnected global marketplace.

Serving a customer base that spans more than 150 countries and includes the majority of Fortune 100 companies, GlobalSCAPE's primary focus is providing customers with intuitive and efficient managed file transfer solutions while also ensuring end-to-end security. For more information, visit <http://www.globalscape.com>.