



# Consolidating Branch-Office Infrastructure Optimizes Information Management and Protection

## Executive Summary

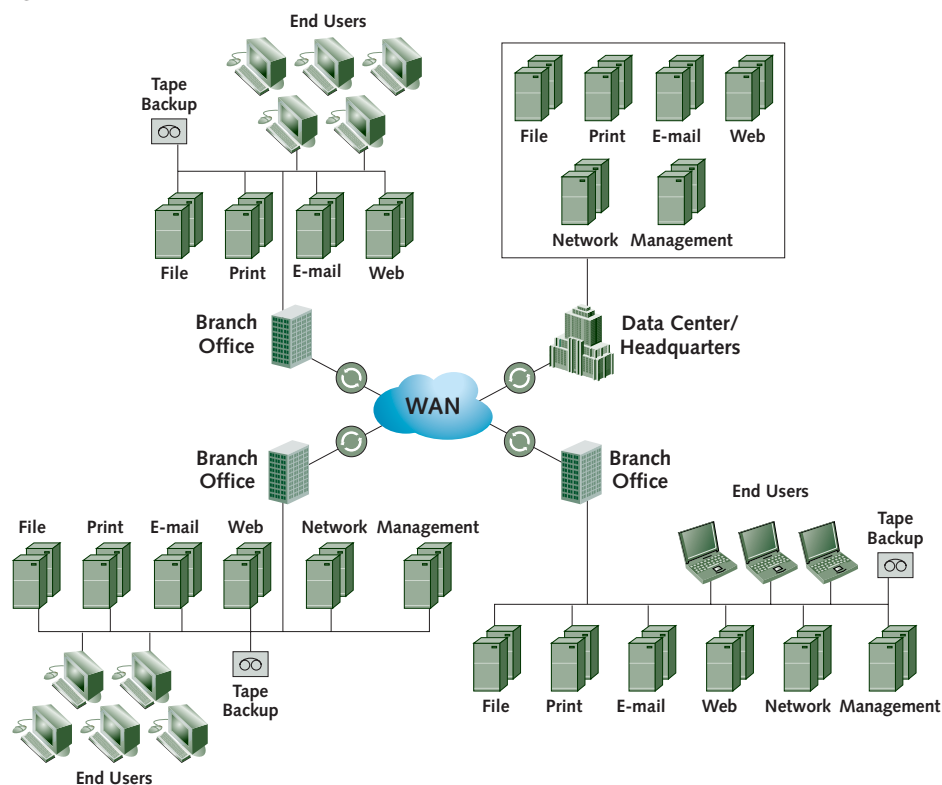
Managing the distributed IT environment has proven to be challenging, time-consuming and costly. This has led some businesses to consider consolidating IT resources in a central location or data center and serving distributed sites with services over the WAN. Many organizations can point to successful data center consolidation projects that improved server and storage utilization rates and reduced IT costs. The next phase of infrastructure consolidation is under way and promises to dwarf the financial and operational benefits that enterprises achieved with their data center consolidation projects.

Remote- and branch-office server and storage consolidation takes the benefits of data center consolidation and spreads them across the entire distributed enterprise. However, the key to achieving the benefits is to smartly deploy WAN optimization to address the technology obstacles of the branch and remote office (see Exhibit 1). Without a solution for optimizing the WAN, branch- and remote-office consolidation projects are destined to fail.

### Exhibit 1

#### The Challenge of Optimizing the Infrastructure of Branch Offices

Source: Yankee Group, 2005



## Table of Contents

I. Remote-Office and Branch-Office Consolidation Market Overview . . . . .	3
II. Remote-Office and Branch-Office Challenges. . . . .	4
III. Benefits of Branch-Office Infrastructure Consolidation . . . . .	5
IV. Conclusions . . . . .	9
Vendor Profile: Tacit Networks . . . . .	9
Recommendations for Enterprise . . . . .	10

## I. Remote-Office and Branch-Office Consolidation Market Overview

The branch or remote office has become critical to distributed organizations. Yankee Group research estimates that 40% of enterprise employees work outside corporate headquarters. In larger, more distributed organizations that figure can reach 80%. This increasingly distributed enterprise structure resulted in a distributed IT infrastructure that became complex and difficult to manage. IT departments built enterprise systems for the LAN; delivering these same applications over a WAN to branch offices created performance and information management challenges. At the branch, files and other local data are typically stored on a local file server, which needs to be backed up for data retention or compliance purposes. With little IT support at the branch office, information management can be problematic. Risks include lost information, corrupt files, poor performance or a lack of compliance. In addition, the cost of purchasing, maintaining and managing a distributed infrastructure became enormous in an era of tightening IT budgets. Data center consolidation has become a proven way of reducing costs, streamlining management, and getting control of information availability and protection.

### Data Center Consolidation

Ten years ago, businesses spent roughly two-thirds of their IT budgets on product acquisition and one-third on managing the IT environment. Today, businesses spend 70% to 80% of their IT budgets maintaining existing IT environments. This leaves precious few resources for more value-driven IT projects. To combat this trend, businesses continuously seek to consolidate IT infrastructure resources within their data centers. Businesses have found that consolidation simplifies their IT environments, reduces management complexity and improves the utilization of existing IT resources. Businesses have also found that it's easier to develop comprehensive business continuity strategies in a simplified, less complex IT environment. Consolidation can significantly reduce overall IT costs (both acquisition and operational), improve management and control, and streamline data center operations such as upgrades, backup and archiving.

Businesses have achieved immediate results through the consolidation of islands of direct-attached storage with centralized network storage, the consolidation of general-purpose file and print servers with network-attached storage (NAS), and the consolidation of web and e-mail servers with next-generation server platforms such as blade servers and powerful 64-bit processors. The next stage in IT consolidation is the consolidation of IT infrastructure across distributed sites.

### The Next Stage: Remote-Office and Branch-Office Consolidation

Multiply the benefits of data center consolidation mentioned above across a network of distributed sites and the potential for cost savings and efficiency improvements is enormous. According to the Yankee Group *2004 Security Survey*, the majority (50.4%) of very large US businesses (more than 10,000 employees) have 50 or more site locations—almost 30% of businesses in this group have 150 or more sites (see Exhibit 2 on next page). Sites include a business' major data centers, main and regional headquarters, branches and offices.

Managing this distributed IT environment has proven to be challenging, time-consuming and costly. This has led some businesses to consider consolidating IT resources in a central location or data center and serving distributed sites with services over the WAN. Consequently, beginning in 2004, businesses turned their attention to their geographically distributed IT infrastructure as the next major area for productivity improvements and cost savings. Solutions targeted at this market space are often called remote-office or remote-branch-office IT solutions.

## II. Remote-Office and Branch-Office Challenges

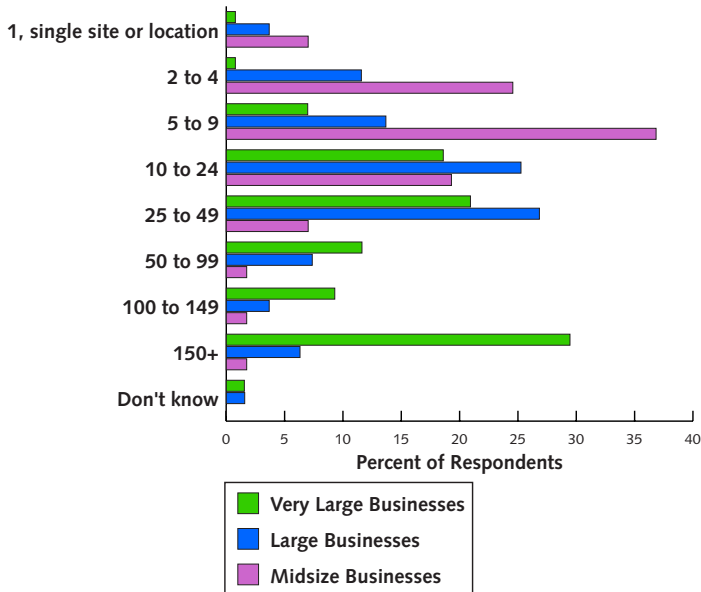
As organizations have expanded and become more distributed, their IT infrastructure has become more complex. It is very common to see branch offices maintaining their own “mini” IT department—a dedicated IT infrastructure that requires local staff to manage. This dedicated infrastructure includes key services such as:

- **E-mail services:** According to the Yankee Group *2005 Application Management Survey*, performance issues related to e-mail services caused an average 16.9% reduction in employee productivity. Availability and enormous data management requirements have often resulted in an over-provisioned, distributed e-mail infrastructure that is difficult and expensive to maintain. In addition, new regulatory mandates, such as the Sarbanes-Oxley Act, for the handling of e-mail make it imperative for a distributed organization to gain central control.

### Exhibit 2

#### Multiple Locations Create Considerable Management Challenges for IT

Source: Yankee Group 2004 Security Survey



- **File services:** Branch offices maintain their own file servers because access to files is critical to productivity, and WAN latency can make file access untenable over a WAN. Therefore, file-based storage in many distributed locations needs to be provisioned and managed. IT departments must implement data protection technology and processes at every remote site.
- **Print services:** Branch offices have dedicated print servers for their networked printers.
- **Web caching:** To improve branch-office access to centralized web applications, IT managers deploy dedicated web-caching devices.
- **Networking services:** IT managers need to deliver networking services such as DNS/DHCP and authentication/authorization (Active Directory) services, and IT managers will often deploy another local dedicated server for this purpose.
- **Management services:** Each branch needs the ability to deliver software upgrades, patches and maintenance for all of its desktops, servers and other IT infrastructure. Ill-equipped management services can result in inconsistent configurations and OS versions.

These branch-office services are critical to the productivity of branch-office workers. However, delivering these services in such a distributed architecture requires significant IT resources. The key tasks that are difficult in this environment and drive up IT support costs include:

- **Local data management and protection:** Configuring local data management and protection strategies that include backup, replication, disaster recovery and archiving consumes resources. They often require the deployment of local back-up servers, disk and tape systems, and local IT staff to support them.
- **Ensuring security:** Site security is needed to protect from threats outside (e.g., viruses, worms, denial of service and intrusion) and inside the business (e.g., theft and sabotage).
- **Maintaining consistency:** IT must manage system images, patches and licenses on laptops, desktops and servers across the business. Failure to maintain consistency increases management costs and can result in vulnerabilities that malicious code can exploit.

- **Reducing operational expenses:** Businesses with distributed sites must hire and deploy local IT staff to support ongoing IT operations, such as responding to end-user issues, ongoing maintenance and upgrades. Managing backups at a local site may involve a local tape library and an IT person to support it, and potentially require use of an off-site storage service.
- **Reducing capital expenses:** IT departments are constantly under pressure to reduce costs and do more with less. This becomes very difficult to do when the IT budget must include the costs of locally deployed IT software and hardware, such as servers, primary and secondary storage, networking equipment and laptops/desktops.
- **Managing file, e-mail, web caching, print and authentication services:** IT managers have many choices for provisioning. Each remote site may have its own file and print servers; a large enterprise may use a hub-and-spoke model or some other distributed deployment. In any case, centralizing these services can reduce IT management costs and optimize data integrity protection, but it may expose performance limitations in the WAN environment.

Consolidating branch-office services enables enterprises to reduce or eliminate these important tasks and achieve their goals of delivering adequate performance and availability and reducing IT costs. However, providing access to centralized files and applications—without performance effect—to geographically distributed users requires a solution that optimizes the performances of files, applications and other services over the WAN. In addition, IT managers need to optimize performance while maintaining data integrity and security.

### III. Benefits of Branch-Office Infrastructure Consolidation

The ultimate goal of branch-office consolidation is to manage the distributed IT environment cost-effectively while not compromising end-user productivity or site availability. Very often, distributed sites depend on connectivity to a data center or to one another to collaborate and conduct business. They share and exchange information frequently. With this increasing collaboration as well as a need for IT departments to centralize data and IT resources comes a dependence on optimizing the WAN. WAN optimization includes techniques such as compression and latency reduction or protocol optimization. Latency reduction is important because simply increasing network bandwidth may not improve performance. This is because file system protocols (such as CIFS/NFS) were not designed for the WAN and TCP/IP is a very inefficient WAN protocol. For example, when a file is opened, there are numerous “handshakes” and acknowledgements sent between the client and server. This is why CIFS and NFS are often dubbed “chatty” protocols. A file that could take a second to open on the LAN could take minutes on the WAN. Furthermore, this same WAN latency prevents centralization and consolidation of key branch-office file, e-mail, print, web, network and management servers, which in turn blocks the dramatic cost-savings that these consolidation and centralization efforts can provide.

To optimize branch-office file, e-mail and other services, enterprise IT managers have had to deploy point solutions that address one problem. For instance, IT managers may need to deploy separate products to speed-up e-mail attachments, another solution to compress large files, another to prioritize application traffic, and so on. Instead of lessening the management burden on branch offices and remote sites, they add to it—and often do not achieve the desired results. They can actually make matters worse by implementing a solution that helps one branch-office service but simultaneously impairs others. Enterprises need a simple, yet more comprehensive, solution that can optimize the branch-office services and reduce management complexity.

Enterprises now have the capability to deploy a single appliance that can optimize each of their critical branch-office services. Core WAN optimization technologies such as wide-area file services (WAFS) that have been developed to combat latency and bandwidth are now being leveraged by certain vendors to optimize e-mail, web and other enterprise applications. IT managers can deploy a single platform in each location and then layer necessary services according to the needs of the site. On one appliance, IT managers can accelerate e-mail services, file services, print services, web caching, networking services and management services. IT managers can also maintain file integrity, coherence and consistency, even in the event of WAN disruptions. Files that were formerly stored locally can now be stored at the headquarters and accessed on demand by branch-office users. The users' applications will perform as if they were accessing the file locally, but files are actually created and stored at the corporate headquarters, where staff is responsible for back-up functions. By implementing a branch-office solution, IT staff can consolidate file servers, eliminate the need for local backup and streamline collaboration between offices without deploying multiple boxes and adding to management complexity. The platform then also serves as a solid foundation to foster branch- and remote-office infrastructure consolidation. Distributed organizations can realize significant operational and financial benefits.

## Operational Benefits

- **Improved availability:** Local offices can access files locally to maintain LAN-like performance of their applications. IT managers at corporate headquarters can conduct backups more regularly and successfully to maintain availability of critical data.
- **Improved security:** By centralizing information management, IT can reduce the number of endpoint security threats and deploy patches and upgrades more rapidly.
- **Centralized management of distributed IT infrastructure and services:** IT managers can maintain global consistency of corporate policies and security. They can stay up-to-date with the latest patches and upgrades, and deploy new applications and IT services more rapidly.
- **Transform IT from a reactive to a proactive function:** Remote- and branch-office consolidation initiatives are an excellent starting point to shift the balance of IT budgets from maintenance tasks to more strategic initiatives.
- **Improved productivity:** Branch-office users experience improved application performance and can now work in real time on the same data set regardless of location, opening up new opportunities for collaboration.

Each of these operational benefits directly translates to impressive financial returns.

## Financial Benefits

- **Reduced opex:** One of the most significant cost savings comes from reducing the local IT staff requirement. Businesses can reduce IT staff or deliver new services without needing to add to local IT staff and still deliver key IT operations such as responding to end-user issues, ongoing maintenance and upgrades. Even eliminating the need for just one employee at a network of 100 sites can be significant. A fully loaded IT employee can cost \$60,000 to more than \$100,000 per year. Multiply that over 100 sites and organizations can save hundreds of thousands—or even millions—of dollars in IT support costs.
- **Reduced capex:** By consolidating infrastructure such as file, print, web and e-mail servers, each site can reduce or eliminate the cost of locally deployed IT software and hardware. Sites can also significantly reduce capex by reducing their purchases of network equipment and primary and secondary storage. More than the initial purchase cost, the organization can save significantly from not having to manage and maintain the infrastructure. A single branch office infrastructure consolidation effort can offset the cost of a midrange file server (\$20,000+), e-mail server (\$10,000+), management server (\$4,000+), network server (\$4,000+), print server (\$2,000+), back-up device (\$5,000+), back-up software (\$2,000+) and labor, which can range from \$20,000 to \$80,000 annually. When you total this up across multiple branch-office locations, the reduction in capital expenditures is truly dramatic.

Overall, organizations can achieve tremendous business benefit from consolidating branch- and remote-office infrastructure. They can increase the productivity of and collaboration among distributed users, improve the ability of users to share data effectively, and eliminate copies of stale or stagnant data. The following example demonstrates these benefits and provides insight into deployment of the branch-office services.

## Deployment Scenario

This deployment scenario depicts the benefits of a distributed organization that a typical financial services company can obtain: A financial research firm has analysts in a number of offices. Each branch office maintains file servers and local tape backups. The analysts use Microsoft Excel and other Office documents and often share information and files. The financial firm has strict compliance mandates, so it must ensure that it backs up regularly. The firm must also demonstrate its safeguards for financial data. This architecture is very distributed and requires dedicated IT staff at each branch to manage critical services such as e-mail, file and print, storage and back-up operations (see Exhibit 1).

A firm like this has some significant challenges. First, it needs to reduce the management burden of its distributed environment to reduce cost. Second, it is always looking to expand into new areas and needs to quickly open new offices with the same availability of corporate applications and data. It cannot continue to scale its business if each branch office has its own dedicated and customized IT services. Last, file sharing and collaboration are core requirements; slow WAN response times affect productivity and revenue. Altogether, it is difficult to deliver acceptable performance, maintain file integrity, and comply with regulations regarding information protection and storage. The firm needs a solution that not only delivers performance and availability at the local level, but can also centralize the infrastructure and management of information at the corporate headquarters. This way, it can grow without adding complexity and additional IT management requirements.

To achieve its goals, this organization consolidated branch- and remote-office infrastructure with a single platform that leverages WAN optimization and wide-area file services technology to deploy file, e-mail and other centralized branch-office services (see Exhibit 3 on next page). The result: It has been able to reduce costs by consolidating file, print and e-mail servers and eliminating locally executed backups. It also improves the productivity of the remote users by making it easier for them to share information and collaborate on financial reports between offices.

This organization can reduce IT support costs by consolidating various services in a central data center. Each branch office deploys a remote appliance that appears to end users as network-attached storage (NAS). The appliance caches, reads and writes to files and other centralized data to provide LAN-like performance—even though the servers reside in the central data center. At the central data center, a server appliance maintains file integrity by managing locks on files. This unified platform delivers significant benefits for all of the firm's branch-office services, including:

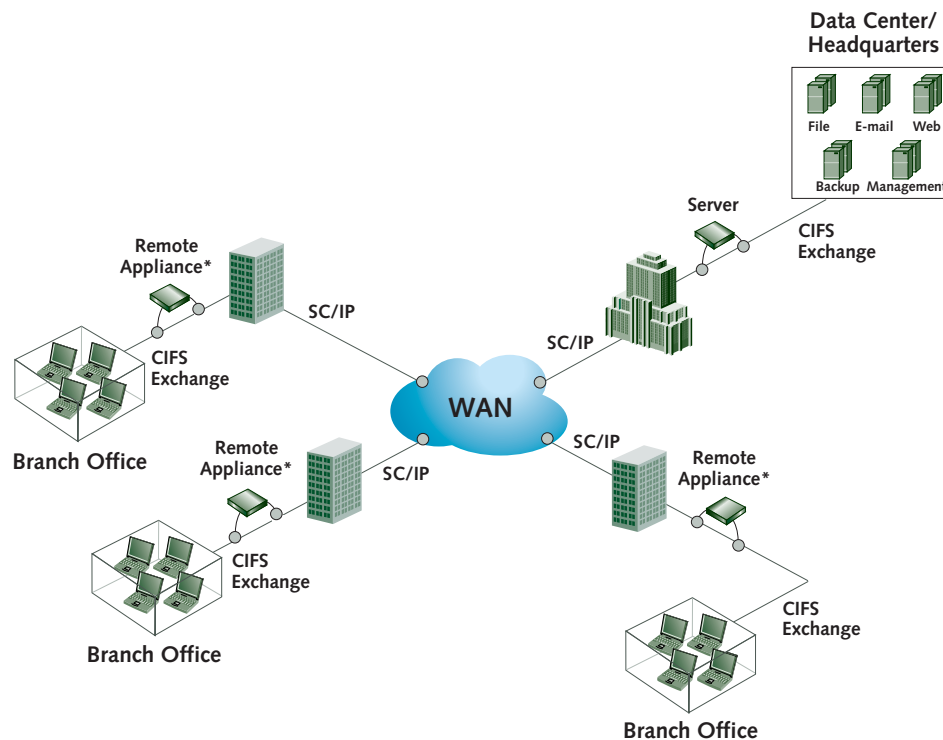
- **Microsoft Exchange services:** The IT staff was able to consolidate Exchange servers within the corporate data center. They no longer have to maintain dedicated Exchange servers at each branch and they maintain performance—even for e-mail attachments. They optimize bandwidth by eliminating redundant attachment delivery.
- **Web services:** It caches frequently visited web pages to increase the performance of web-enabled applications.

- **Management services:** The organization saves time and money by managing software upgrades and PC updates from the central data center.
- **Networking services:** The branch offices no longer need a dedicated DNS or DHCP server. The staff at the central data center manages these tasks.
- **Print services:** This financial services firm prints a large number of documents and forms. With print services consolidated at the corporate data center, it no longer needs dedicated print servers at each branch.
- **File services:** WAFS is the core technology that provides the read/write access to all files over the WAN. The staff centralizes all files and data in the corporate data center to manage access, security, back-up and compliance requirements. They deliver immediate cost savings by consolidating storage platforms and servers that otherwise would be the responsibility of each branch.

### Exhibit 3

#### Successful Branch-Office Consolidation Using WAN Optimization and WAFS Technologies

Source: Yankee Group, 2005



\*Capable of handling centralized file, e-mail, web and management services, and local print/network services

To make WAFS possible, the appliance uses a specialized WAN protocol to optimize the WAN and give users the impression that they are locally accessing files and branch services. The WAN protocol removes the chattiness of TCP. It eliminates roundtrips that are responsible for latency issues and can eliminate redundant data that can create bandwidth issues. With the new architecture, IT can eliminate the e-mail servers, file and print servers, and dedicated storage at each branch. Branches are much easier and less expensive to maintain. The firm can open new offices quickly to respond to business opportunities. And, very importantly, the organization can centrally manage information security. This financial services firm would be accountable for multiple compliance mandates such as the Sarbanes-Oxley Act. It may have to recover thousands of e-mails for litigation purposes at a moment's notice. By centralizing data management, the firm can be much more confident that data is secured and protected according to regulations. It can be sure that backups are executed according to policy and information is quickly recoverable.

#### IV. Conclusions

Enterprises evaluating solutions for branch-office consolidation need to consider some key technology and product requirements including:

- **Scalability:** A solution needs to scale as the organization grows and support growing users at each branch location without requiring additional dedicated infrastructure.
- **Performance:** A solution needs to deliver LAN-like performance. End users will balk at any solution that introduces latency, especially those who are accustomed to accessing local file storage.
- **Reliability and resiliency:** A solution must be able to withstand WAN disruptions without affecting file integrity.
- **Security:** A solution must not compromise data security in any way; offering a methodology that does not breach any of the security mechanisms that organizations have deployed.

- **Integration:** A solution must integrate into and be compatible with existing platform technologies and management investments in the enterprise. As many distributed enterprises have made substantial investments in Microsoft technology, it is critical that a branch office IT solution can protect these investments and integrate into Microsoft systems and management tools.

One vendor that offers a solution for branch-office technology consolidation that addresses the key challenges is Tacit Networks.

#### Vendor Profile: Tacit Networks

Tacit Networks' Ishared "Stackable" Services is a suite of data center services for branch offices. Based on Tacit Networks' Wellspring Architecture, it provides file services, exchange (e-mail) services, networking and management services, web services and print services for branch offices from a central data center. The solution has two components: the Ishared Remote appliance and the Ishared Server appliance. The remote appliance resides in the remote office and appears as a file server to users within the office. The appliance delivers all the branch-office services so the branch does not need separate, dedicated infrastructure for e-mail, storage file serving and other services such as DNS, DHCP or authentication. The server appliance appears to the data center file servers as a standard client. The server appliance is the brains of the solution and communicates with the remote appliances to deliver branch services from the corporate data center.

Tacit's Wellspring Architecture provides the foundation for optimizing the WAN and includes:

- **One-point storage caching:** Files requested by remote users are cached at the remote office appliance. The system is designed to utilize existing storage at the data center to perform WAN optimization, which allows for greater scalability and high "fan-in" ratios between remote sites and central sites.

- **WAN-optimized protocol:** To move data as efficiently as possible across the WAN, Wellspring incorporates a WAN-optimized protocol that operates between the server and remote appliances. This protocol includes both latency and bandwidth optimizations, and layers six different optimization techniques, including data streaming, read-ahead, file-aware differencing, compression, data aggregation and I/O clustering. Tacit Networks' appliances at either side of the WAN link translate seamlessly between native application protocols and Tacit Networks' optimized transport, so the solution is transparent to branch-office users.
- **File-aware implementation/distributed file system:** The file-aware capability of Wellspring protects remote users from stale data, write collisions, WAN outages and system failures. It maintains the consistency of the data using logging and journaling techniques found in advanced file systems and adapted to the WAN.
- **Application acceleration:** Wellspring includes optimizations for file-sharing protocols CIFS and NFS, Microsoft Exchange, and HTTP-based web applications. In the future, this technology will accelerate other applications.

Additionally, because Tacit Networks Ishared Stackable Services are built on a native Windows infrastructure, they work seamlessly with Windows-based security and management technologies, are futureproofed against protocol changes in common protocols such as CIFS and MAPI, and integrate third-party management tools. Tacit is unique in the industry in its ability to deliver on a Windows-based platform.

## Recommendations for Enterprise

- **Enterprises will continue to expand and IT will need to deliver the important IT services to an increasingly distributed organization.** The demands on the network will only increase as organizations seek to consolidate IT infrastructure and optimize the WAN to deliver services from a central data center. Enterprises need a solution that delivers value today and will adapt and grow in lockstep with their branch-office needs. A sound strategy is to implement remote- and branch-office solutions in phases.
- **In the first phase, begin with the identification and reduction of file, print and web servers.** These are prime targets and the low-hanging fruit that demonstrate immediate ROI. Second, eliminate as much direct-attached storage as possible. Finally, centralize backups and other data protection strategies, as well as data retention and archiving.
- **In the next phase, develop pilot projects for the centralization of major applications such as e-mail.** E-mail is one of the largest management headaches in any enterprise. Consolidating e-mail infrastructure can return big dividends and really show the value of the project. Use a similar phased approach for other branch-office services to build centrally managed infrastructure.
- **Once enterprises have consolidated branch-office services, they will have a foundation in place to effectively manage and exploit the value of their distributed organization.** Branch offices exist to extend the reach of the enterprise and create a competitive advantage. By delivering consistent, reliable IT services to every branch, the enterprise doesn't just optimize its WAN; it optimizes its business.

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