

Optimizing SMB Traffic for Increased Employee Productivity

with Riverbed Acceleration Solutions



Productivity in today's enterprises depends on fast, reliable access to files, regardless of an employee's location. In addition, many businesses rely on file sharing to collaborate and move, create, and edit resources across multiple devices worldwide.

What happens when large files are slow to transfer and open? Employee experience suffers, and productivity decreases. This is especially true for organizations with data-heavy applications where performance depends on fast file-sharing capabilities – such as architecture firms using computer-aided design (CAD), machine tool companies using computer-aided manufacturing (CAM) software, or law firms with many client documents.

Here is where Server Message Block (SMB) protocol comes in. SMB is a popular network file-sharing protocol that allows for secure, remote access to resources like files, printers, and other devices. It's a popular solution to ease employee file sharing, as it's easy to manage and available on both enterprise server and desktop operating systems.

However, SMB is not optimized for Wide Area Network (WAN), where the protocol's chattiness (the back-and-forth handshake of the protocol) magnifies the network's latency. Even organizations working with the latest version of the SMB protocol experience delays in their file transfer due to latency, which ultimately affects performance.

As organizations continue to operate with decentralized workforces and a combination of on- and off-premises devices and resources, efficient file sharing is more important than ever.

That's why businesses – even those with high-speed internet – need WAN acceleration to reduce latency and bandwidth utilization, as well as to improve file share performance and ultimately boost employee productivity.

Let's examine the benefits of WAN acceleration for faster SMB file transfer and how Riverbed Acceleration products can help.

Why is WAN acceleration for SMB protocol necessary?

WAN acceleration refers to complementary technologies that improve data transfer efficiency between centralized data centers and remote locations across a WAN. Acceleration aims to improve the end-user experience by increasing the speed and ease of access to business-critical applications and information.

Common WAN performance killers include:

Network congestion

When the amount of data sent through the network exceeds the network's processing capacity, congestion can occur. Congestion can slow down data transfer and cause packet loss.

Network congestion ultimately affects the performance of critical applications and creates a poor digital experience for employees. For many organizations, this

translates to lower productivity rates and, ultimately, a decrease in revenue. When file-sharing performance lags, teams struggle to collaborate and projects stall. Additionally, this may cause organizations to continue increasing bandwidth, which is costly, without dealing with the underlying issues fueling the congestion.



High network latency

Network latency is the time it takes for a data packet to go from one place to another. Various factors impact data transfer speed, including cabling, network equipment traversal, and signal loss. This means that, on average, latency between Chicago and New York might be close to 21ms and close to 70ms between San Francisco and New York.

The negative effects of latency increase if the application protocol is particularly chatty, like in the case of SMB. As latency builds during each round-trip data transfer, delays become noticeable by the user and translate into users struggling to open or edit files – a frustratingly poor digital user experience.

Why does this matter so much? Recently, Forrester found that [60% of technology](#) and business decision-makers planned to prioritize improving digital employee experiences to attract talent, improve productivity, and promote employee engagement. In our own [2023 Riverbed Global Digital Employee Experience \(DEX\) Survey](#), we found that 91% of respondents reported plans to provide more advanced digital experiences in the next five years to meet the demands of younger employees entering the workforce.

The impact of a negative digital experience from high latency can extend beyond productivity and revenue loss and affect a company's ability to find and retain talent, especially as younger generations enter the workforce. This can, in turn, hurt a company's brand reputation.

The challenge of SMB WAN acceleration

While the negative impacts of failing to optimize SMB traffic are clear, many organizations still run into issues optimizing SMB traffic due to the protocol's inherent security features, like the signing and encryption features available in SMB Versions 2 and 3. Why? Before optimizing, it's necessary to decrypt SMB traffic and then re-encrypt the traffic before sending it to protect the security of the transmitted data. Optimization solutions must act as a trusted man-in-the-middle (MITM) and interact with the client's Active Directory (AD).

Most companies adhere to unique security rules and regulations, which can make the interaction of optimization solutions with the AD particularly challenging. If the networking team cannot reconcile their access needs with the security team, then SMB optimization cannot be deployed, negatively impacting application performance.

SMB traffic optimization with Riverbed Acceleration

Organizations looking to improve their SMB traffic quality can utilize [Riverbed Acceleration](#) solutions to boost the speed of applications and services across the distributed enterprise while working within the parameters of their security rules and regulations.

The result is fast, agile, and secure application performance over any network to users, anywhere.

Riverbed® SteelHead™

A key component of the Riverbed Acceleration solutions, [SteelHead](#) – a physical or virtual appliance that optimizes and accelerates network traffic and the performance of applications – leverages application awareness to distinguish between network traffic. The product can be deployed on both data centers and branch offices, and offers transport, data, and application streamlining – providing up to [99% reduction](#) in bandwidth consumption and 40x acceleration of SMB traffic, signed or encrypted.

Riverbed Client Accelerator

[Client Accelerator](#) extends SteelHead’s WAN optimization capabilities to remote employees and road warriors. The product operates directly on the end-user’s laptop and pairs with other SteelHead products to provide access to business-critical applications with speed and security, regardless of location.

Riverbed Cloud Accelerator

Cloud deployment and migration depend on quick, secure delivery of workloads. [Cloud Accelerator](#), available on Azure and AWS marketplaces, uses SteelHead’s WAN optimization to improve the cloud-based transfer of files and workloads to applications.



Customer Success Story: Riverbed SMB traffic optimization in action

A top engineering firm struggling with long download times over SMB protocol deployed Client Accelerator on the end-user laptops and increased download speeds by 86%. File transfer times decreased from 28 minutes to less than 4 minutes, enabling the firm’s remote employees to work more efficiently and effectively.

In addition to eliminating unpredictable cloud performance, organizations can:

- Accelerate migration to the cloud
- Meet or exceed service level agreements (SLAs) for cloud backup
- Reduce data egress costs
- Stabilize the performance of cloud workloads while preserving security

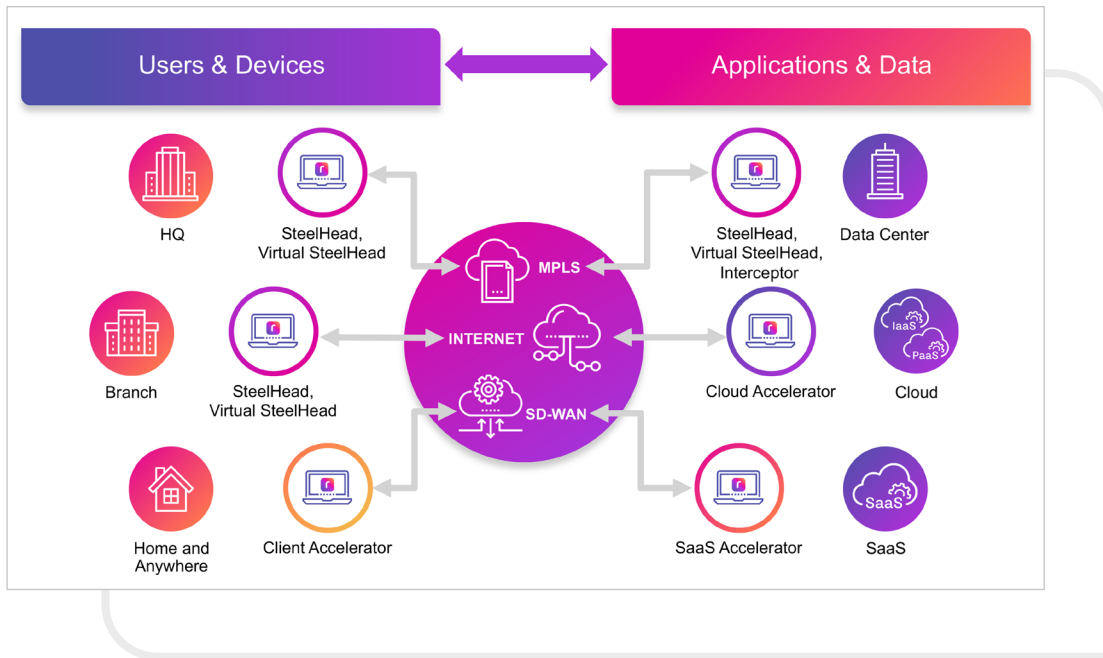


Figure 1: Riverbed Acceleration ecosystem. Bringing users, apps, and data together.

Riverbed’s SMB Acceleration deployment models

To provide full latency and bandwidth optimization for the SMB file share protocol, Riverbed Acceleration solutions must act as a trusted MITM and interact with the client’s AD. Riverbed offers three deployment models that work with SteelHead, and each deployment model addresses different security postures and IT organization structures. These three models allow customers to choose a best-fit solution that securely accelerates their SMB file shares, improving application performance and employee user experience.

Model 1: SteelHead directly connected to Active Directory

The first option connects each SteelHead appliance directly to the AD. This option includes an easy configuration setting with a widget for each SteelHead appliance, which automates most of the configuration process. In addition, Riverbed’s SteelCentral Controller (SCC) is helpful for central domain management and joining multiple SteelHead appliances.

Advantages:

- Simple, guided configuration steps
- Support for both Kerberos and NTLM authentication

Requirements:

- Requires SteelHead appliance to join the domain
- Requires <10 ms latency between SteelHead and domain controller(s)

Model 2: Deploy the Riverbed WinSec Controller

The **WinSec Controller** is a non-network appliance that interacts with the domain controller as a **Tier 0** entity. Compliant with the Microsoft Enterprise Access Model, it sits between a SteelHead appliance and the domain controller, proxying requests and responses on the server side.

Advantages:

- Better security posture with Tier 0 appliance
- Compliant with the Microsoft Enterprise Access Model
- Supports greater latency (up to 110 ms) between WinSec Controller and domain controller(s)

Requirements:

- Kerberos authentication only

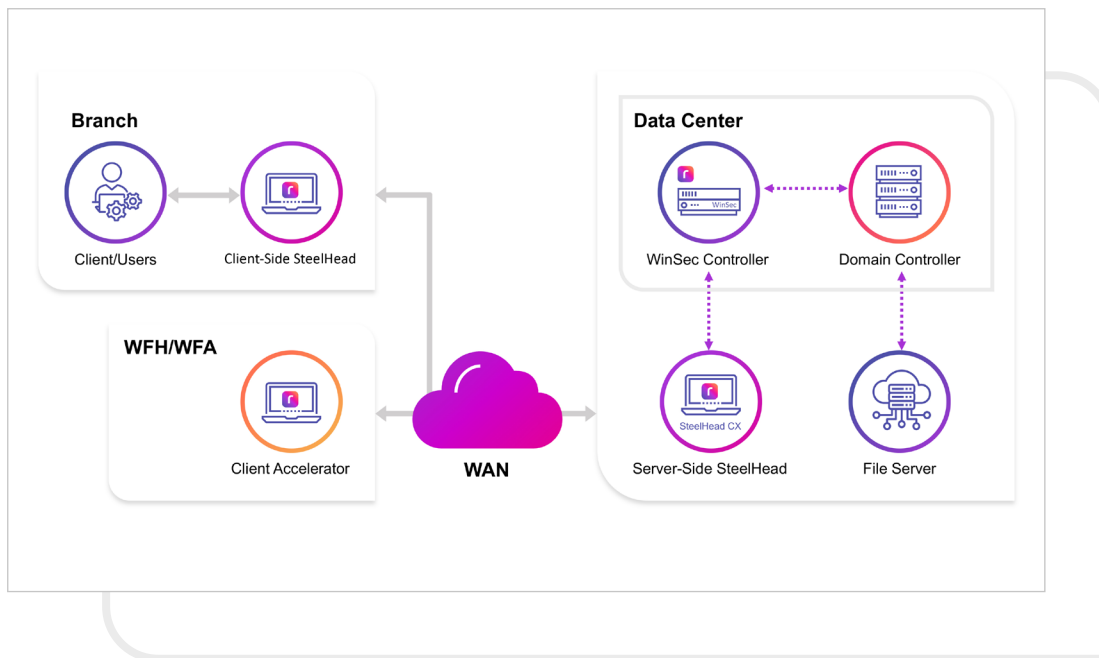


Figure 2: Riverbed Acceleration deployment model with WinSec Controller.

Model 3: Domain Independent SteelHead Kerberos Only (DISKO)

The DISKO configuration mode eliminates the need to join SteelHead to the AD. It simplifies SteelHead configuration and reduces security concerns over AD access by exclusively supporting Kerberos Authentication. The SteelCentral Controller (SCC) can centrally manage DISKO for multiple SteelHead appliances.

Advantages:

- Does not require SteelHead appliance to join the domain

Requirements:

- Kerberos authentication only
- Requires <10 ms latency between SteelHead and domain controller(s)



The benefits of Riverbed WAN acceleration

Riverbed WAN acceleration solutions employ several advanced optimization techniques to improve the performance of protocols and applications over WANs dramatically. These techniques include:

Transport streamlining

By using a set of standards-based and proprietary techniques to optimize transmission control protocol (TCP) traffic, Riverbed WAN acceleration solutions:

- Ensure that efficient retransmission methods are used (such as TCP selective acknowledgments)
- Negotiate optimal TCP window sizes to minimize the impact of latency on throughput
- Maximize throughput across a wide range of WAN links

Data streamlining (data deduplication)

Riverbed WAN acceleration solutions use traditional data compression algorithms and proprietary Scalable Data Referencing (SDR) to significantly reduce bandwidth load by removing redundant data from the wire, even across different applications.

Application streamlining

With its application-specific modules, Riverbed WAN acceleration can address application chattiness, reducing the number of times data travels across the WAN and dramatically improving the application's performance and response time.

Customer Success Story: Riverbed SMB traffic optimization in action

Quarles & Brady, one of the largest U.S.-based legal service providers according to the American Lawyer's Am Law 200 list, struggled with long upload, download, and transfer times for client documents. The longer transfer times led to higher customer attorney fees and made it difficult for the firm's hybrid, distributed workforce to work through cases quickly.

Using Riverbed Acceleration products, SteelHead and Client Accelerator, the firm reduced document transfer speeds from minutes to seconds. The solutions also helped Quarles simplify its tech infrastructure and reduce spend on bandwidth and operational fees.

These technical benefits translate into organizational improvements such as:

Increased employee satisfaction and productivity

Improving employee satisfaction can boost retention rates, helping organizations avoid resource gaps. The increase in productivity can also boost overall revenue across the organization.

Increased IT savings by reducing network and infrastructure costs

Optimizing bandwidth usage eliminates the need to purchase additional bandwidth and lowers IT operational costs, as less network support is needed. In our DEX survey, 36% of IT decision-makers identified

budget constraints as a major obstacle to delivering an excellent digital experience. With the money saved from WAN acceleration, companies can reallocate funds and continue improving their employees' digital experience.

Improved application performance for the end user

Whether you're a legal firm sharing documents with clients or an engineering company inviting customers to access the latest design schematics, you're most likely doing so through applications. Resolving congestion and latency issues in your file transfer protocol can improve the performance of the applications that access the files and boost customer satisfaction.

Conclusion: A best-in-class solution for optimizing SMB traffic

SMB traffic optimization is not an option for the modern distributed enterprise – it's a necessity. Businesses must implement the proper optimization technologies to improve employee experience, avoid wasting time and resources, and increase revenue.

Riverbed proves that achieving SMB traffic optimization over WANs while maintaining the enterprise's security posture is possible. Riverbed provides multiple deployment models based on an enterprise's security needs and helps organizations reach faster SMB transfer speeds – up to 40 times – and see a significant reduction in data – up to 99%.

Ready to accelerate your applications and improve your user experience? If you are a current customer or new to Riverbed and want to learn more, please [contact us here](#).



Riverbed – Empower the Experience

Riverbed is the only company with the collective richness of telemetry from network to app to end user that illuminates and then accelerates every interaction so that users get the flawless digital experience they expect across the entire digital ecosystem. Riverbed offers two industry-leading solution areas – Alluvio by Riverbed, an innovative and differentiated Unified Observability portfolio that unifies data, insights, and actions across IT, so customers can deliver seamless digital experiences; and Riverbed Acceleration, providing fast, agile, secure acceleration of any app over any network to users, whether mobile, remote, or on-prem. Together with our thousands of partners, and market-leading customers across the world, we empower every click, every digital experience. Learn more at riverbed.com.