

# PERFORMANCE BRIEF: Mobile Application Acceleration

## TEST SUMMARY

- Accelerates Windows file sharing up to 95x with a 99% reduction in bandwidth utilization
- Improves Microsoft Exchange email attachment transmission up to 54x and reduces traffic by up to 97%
- Improves SharePoint HTTP (wget) file save performance by up to 63x with up to a 99% reduction in traffic
- Speeds application performance over wireless data cards and VPNs

## Riverbed® Steelhead® Mobile Accelerates Applications for Mobile Workers

### Steelhead Mobile Accelerates Applications Wherever Workers Connect

Steelhead Mobile accelerates enterprise applications for remote users to improve productivity and collaboration for globally distributed teams. Organizations and workers have come to expect a dip in productivity and performance when accessing IT resources remotely, but Steelhead Mobile can help overcome these limitations and deliver LAN-like speed to remote users.

Combining mobility and performance, Steelhead Mobile delivers on the promise of global flexibility by virtually eliminating distance and bandwidth constraints for applications. Companies can leverage the right staff for projects regardless of geography, helping ensure success and giving them a competitive edge in the marketplace.

Riverbed takes a multi-tiered approach to optimization to address the problems of bandwidth, latency and application protocol inefficiencies through a unified solution. Steelhead Mobile utilizes industry-leading data streamlining and transport streamlining to provide data reduction, compression, and transport protocol optimization. Enterprises can reduce traffic on the WAN by as much as 95% and transport layer roundtrips by up to 98%, allowing organizations to successfully deliver faster application performance while avoiding bandwidth saturation.

By extending the same technology utilized in the award-winning Steelhead appliances, Steelhead Mobile delivers unparalleled performance gains to the mobile workforce. Steelhead Mobile accelerates all the key enterprise applications and provides even faster performance gains through its application modules, which specifically target inefficiencies for commonly used protocols. This results in further performance gains for customers and can eliminate up to 98% of application traffic roundtrips over the WAN.

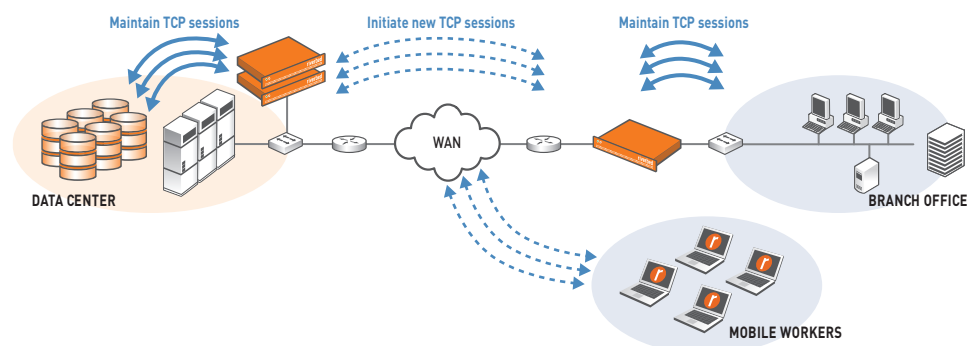
### Accelerating Remote Access for Key Enterprise Applications

**Windows File Sharing (CIFS).** Windows file sharing is often reduced to the point of being unusable for remote users. Steelhead Mobile frees mobile workers by providing targeted CIFS protocol optimizations in addition to data streamlining and transport streamlining. The resulting performance gains accelerate CIFS traffic by up to 95x to enhance user productivity and enable collaboration for distributed workers.

**Microsoft Exchange (MAPI).** Steelhead Mobile is the only wide-area data services (WDS) solution on the market that provides a MAPI protocol optimization for Exchange 2003. Leveraging Riverbed's data reduction and transport optimization capabilities in conjunction with application streamlining for Exchange creates unparalleled performance gains for remote Exchange users. The unique multi-tiered Steelhead optimization approach makes sharing documents via email almost instantaneous while freeing up the WAN link for other applications.

**Web Applications (HTTP).** Enterprises are utilizing HTTP for everything from e-commerce to mission-critical applications. Through its data streamlining and transport streamlining capability, Steelhead Mobile delivers optimizations for HTTP to overcome protocol chattiness and latency for web-based applications. As a result, the user experience improves dramatically and the transaction throughput of web services increases. With Steelhead Mobile, organizations can deliver centralized web applications to the mobile workforce across global environments without sacrificing performance.

### Typical Steelhead Mobile Deployment Architecture



## TESTING SCENARIO

These tests were performed using a Windows 2003 Server Enterprise Edition running Microsoft Exchange 2003 Server, SharePoint Services 2.0 and Internet Information Services (IIS) version 6.0.

The client ran Windows XP Professional with a default configuration of the Steelhead Mobile client version 1.0.0.36.

Performance tests were run using a 256k or T1 (1536k) WAN link with 100ms of latency. Some tests were also run using a Verizon Wireless V620 Broadband card with 788Kbps of throughput on average and a latency of 209ms.

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## DEPLOYMENT BENEFITS

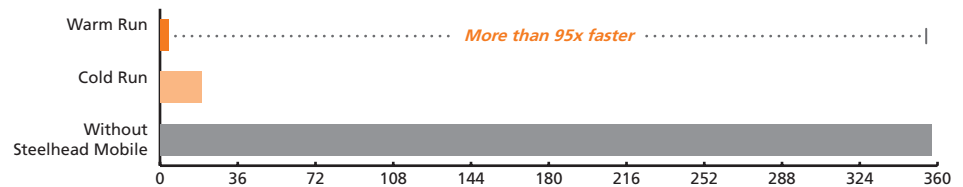
Deploying Riverbed Steelhead Mobile produces significant benefits

- Improved productivity.** Windows file transfers, web-based applications, and accessing email remotely can now be significantly accelerated wherever users work. By dramatically reducing the time mobile workers have to wait, productivity increases and employees can save hours every day.
- Faster, more efficient collaboration.** By reducing the time to access files, email attachments, or document sharing portals, users can collaborate faster even when they work remotely. Improving responsiveness also enables users to work on shared data to help eliminate version control problems across a broad range of applications.
- More satisfied users.** With improved application performance, users are more satisfied, data moves faster, and remote workers are no longer "remote".

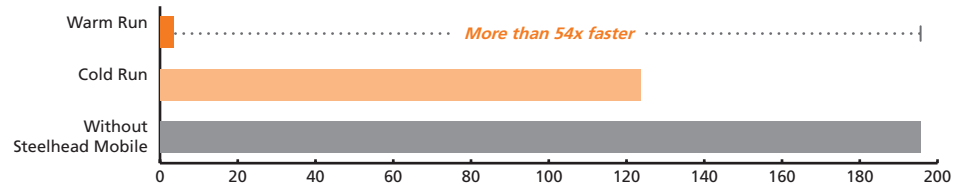
## Performance Improvements

Test results show that Riverbed Steelhead Mobile significantly accelerates a broad range of applications that enterprise mobile workers would often use. Downloading Microsoft Exchange attachments showed a 54-fold improvement in download times and a 97% reduction in bandwidth utilization. Windows file sharing was accelerated 95x with a 99% data reduction. Microsoft Sharepoint HTTP file saves were improved 158x with a 99% data reduction over a 256k link. Performing the same Sharepoint test via a Verizon Wireless card resulted in a 63x acceleration and 99% reduction in bandwidth utilization.

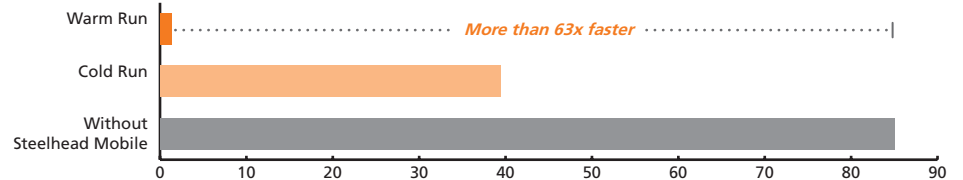
Windows File Sharing: 37.7 MB file over a T1 with 100ms RTT latency – Time to Complete (in sec)



Receive an Email Attachment: 6.14 MB file over a 256Kbps link with 100ms RTT latency – Time to Complete (in sec)



SharePoint HTTP File Save: 6.14 MB file via Verizon Wireless v620 Broadband Card (788Kbps with 209ms RTT latency) – Time to Complete (in sec)



*\*These results are based on the testing scenario presented in this paper. Your results may vary based on the conditions of your own network and the specifics of your own use cases.*

## Steelhead Mobile Features

Steelhead Mobile combines patent-pending data reduction, TCP optimization, application-level latency optimizations, and management functionality. Together, these technologies provide a comprehensive solution for enterprise WDS, scaling across a range of applications and network topologies to accelerate applications from five to 50 times, and sometimes up to 100x. There are four key components:

**Data streamlining** – Data streamlining works across all TCP applications to reduce bandwidth consumption by 60% to 95%. Data streamlining works across Windows file sharing, Microsoft Office, Email (including MS Exchange and Lotus Notes), CAD, ERP, databases, and all other applications that use TCP, to ensure the same data is never sent more than once over the WAN.

**Transport streamlining** – Transport streamlining reduces the number of TCP packets required to transfer data by 65% to 98%. Transport streamlining overcomes TCP limitations by adapting transmission characteristics such as window scale, loss handling, congestion notification, and more.

**Application streamlining** – Application streamlining provides additional order-of-magnitude application performance improvements by reducing application protocol chattiness up to 98% and minimizing application overhead. By minimizing application demands on the network such as application protocol round trips and required network connections, Steelhead Mobile can provide massive throughput increases to applications including Windows file sharing (CIFS) and Exchange (MAPI).

**Management streamlining** – Riverbed simplifies the deployment and management of Steelhead Mobile software by enabling the easy build of MSI packages through the Steelhead Mobile Controller (SMC). The SMC enables central configuration of policies and updates for distributed mobile workers and enterprise reporting and troubleshooting capabilities. Optional email or SNMP alerts and scheduled jobs can be configured with the SMC as well.

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