

# Microsoft® Exchange 2010®/Outlook 2010 Performance with Riverbed® WAN Optimization

A Microsoft and Riverbed whitepaper

## Introduction

Microsoft Exchange Server 2010, the cornerstone of the Microsoft Unified Communications solution, has long been the choice of organizations to enable rich and productive collaboration among its users. It has become the corporate standard in email, calendaring, and workforce productivity. As a result, significant time and IT resources go into creating a robust, reliable, high-performance Exchange environment. IT departments regularly consider deploying additional exchange servers, moving servers to branch offices, and even adding more bandwidth in order to improve Exchange performance. To alleviate this need and provide IT departments with the benefit of Exchange consolidation combined with improved performance, Riverbed Steelhead® appliances offer application acceleration for MS Exchange Server – Outlook traffic, delivering LAN-like performance to distributed Outlook users.

## Riverbed Technology enhances and extends Microsoft Exchange implementations

Riverbed significantly optimizes Microsoft Exchange traffic to deliver superior performance for remote offices by utilizing the Riverbed Optimization System (RiOS)®, which simultaneously addresses bandwidth constraints and the combined effects of latency and protocol inefficiencies. RiOS uses fine-grain data reduction, as well as compression, to perform Data Streamlining, typically reducing bandwidth utilization by 60% to 99%. Transport and Application Streamlining minimize protocol chattiness, eliminating 65 to 99% of packet round trips across the WAN. RiOS also utilizes specialized Application Streamlining for MAPI, which enables significant performance improvements for Outlook clients for sending/receiving email, including encrypted mail and those with attachments. With RiOS, distributed Exchange servers and complex replication models are no longer necessary for accelerated performance to any office, anywhere in the world. Ultimately, this paper will present the Riverbed Steelhead appliance as a solution to the WAN performance obstacles Exchange/Outlook users may experience.

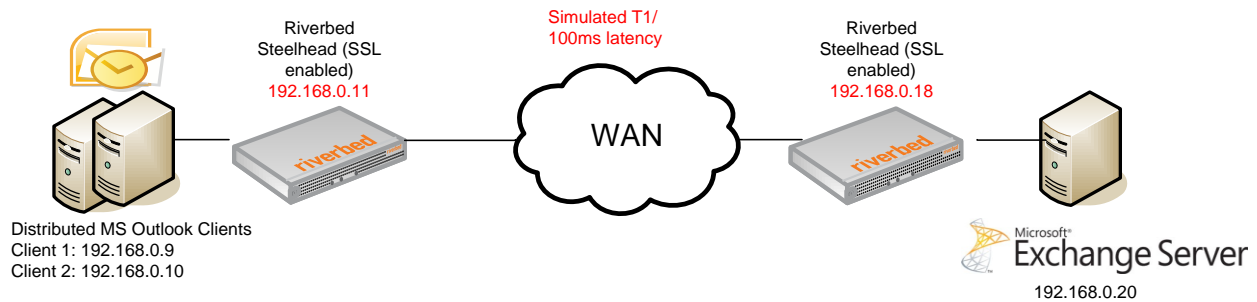
## Customers want to mitigate the effects of Latency and Bandwidth experienced by distributed Outlook clients to:

- Boost the performance of email send/receive operations in distributed environments
- Eliminate network connection congestion due to lower bandwidth
- Significantly reduce or minimize chattiness of the MAPI protocol
- Preserve secure, encrypted message exchange while increasing performance
- Consolidate Exchange servers at the data-center

## Riverbed and Microsoft Exchange Test Summary

Testing was performed in conjunction with the Microsoft Exchange performance team.

The test configuration simulated a typical Outlook client scenario accessing the Microsoft Exchange server in a distributed enterprise. The simulated client was at a remote office accessing a centralized Microsoft Exchange 2010 server over 1544kbps WAN bandwidth with 100ms latency (round trip time). See logical diagram in Figure 1 below.



**Figure 1: Test setup**

Tests were performed using Outlook 2010 clients running on Windows 7 Enterprise platforms, connecting to an Exchange 2010 Server running on Windows 2008 R2.

The testing included common activities such as sending and receiving email, both encrypted and unencrypted, with a combination of file attachment sizes.

The performance tests were run on T1 WAN links with a latency of 100ms.

Refer to the Steelhead Management Console User's Guide for encrypted MAPI configuration settings on the Steelhead appliances.

## Terminology

A **“cold”** operation is defined as a data transfer that has never been seen by the Steelhead appliance before (completely new data).

A **“warm”** operation is defined as a data transfer in which the Steelhead appliance has seen most or all of the data before (warm performance is also observed with an incremental change of data that has been used by another application across the WAN).

## Test Results

The table below highlights a sample of the Exchange 2010 performance improvement and bandwidth reduction observed, with Steelhead appliances in the network. Graphs are also included for clarity.

Testing showed Exchange 2010 performance improvements of the order of 34x for email send operations. Also bandwidth usage was reduced by up to 99% with the Steelhead appliance.

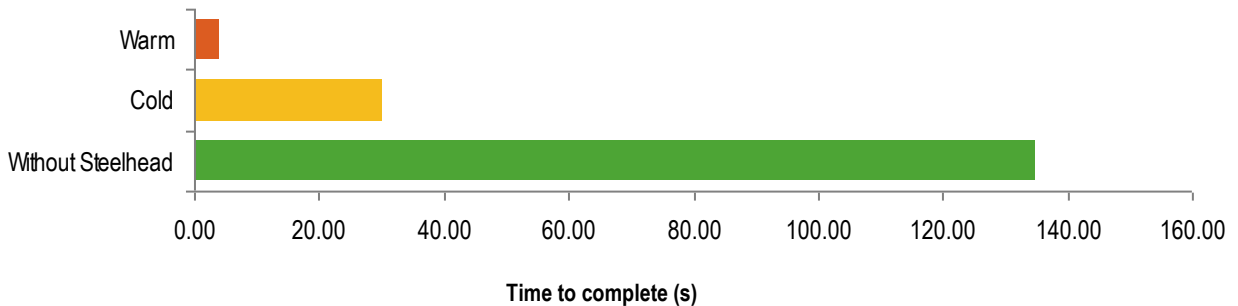
MS Exchange 2010 Test Description	Time without Steelhead (seconds)	Time with Steelhead (Cold)	Time with Steelhead (Warm)	Performance Improvement
Send email (clear-text) with 6.3MB .ppt attachment	135	30	4	34x
Send email (encrypted) with 6.3MB .ppt attachment	140	42	6	23x
Send email (encrypted) with 6.3MB attachment to multiple recipients	144	60	18	8x

**Table 1: Performance Improvement results for Exchange 2010 with Riverbed Steelhead**

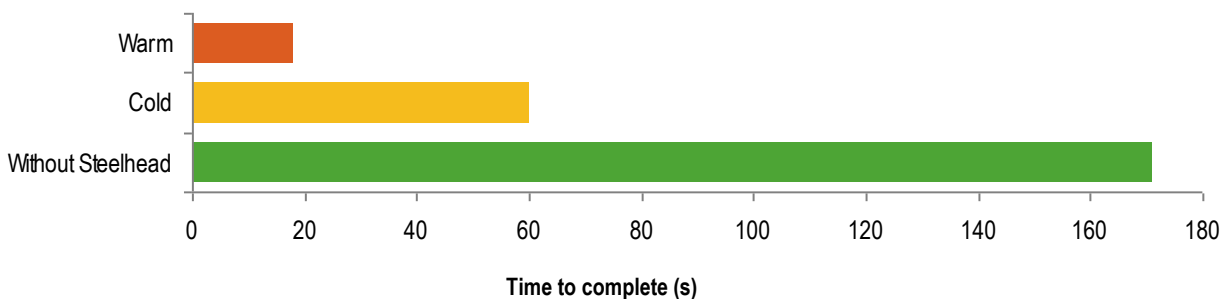
MS Exchange 2010 Test Description	Bytes transferred without Steelhead	Bytes transferred with Steelhead (cold)	Bytes transferred with Steelhead (warm)	Bandwidth Reduction
Send encrypted 6.3MB attachment	12279054	4306155	107707	99%
Send email 6.3MB attachment to multiple recipients	12272218	8426731	345177	97%

**Table 2: Bandwidth Reduction results for Exchange 2010 file with Riverbed Steelhead**

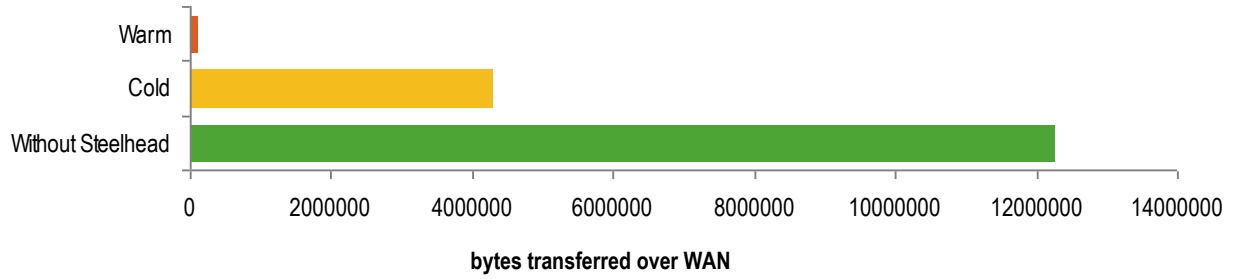
**Send email (clear-text) with 6.3MB attachment – Performance Improvement**



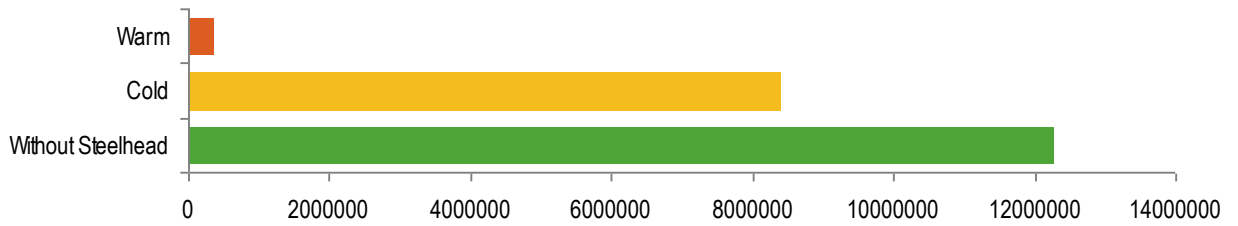
**Encrypted email send with 6.3MB attachment to multiple recipients – Performance Improvement**



**Encrypted MAPI – Send email with 6.3MB attachment – Bandwidth Reduction**



**Encrypted email with attachment to multiple recipients – Bandwidth Reduction**



## Riverbed WAN Optimization Results Highlights

- Outlook/Exchange operations are up to 34 times faster
- Bandwidth utilization is reduced by up to 99%

### Steelheads Powered by the Riverbed Optimization System (RiOS)

RiOS software combines patent-pending data reduction, TCP optimization, application-level latency optimizations, and remote office file and management functionality. Together, these technologies provide a comprehensive solution for enterprise wide-area data services, scaling across a range of applications and network topologies to accelerate applications up to 100x. RiOS consists of four key components:

**Data Streamlining** – RiOS Data Streamlining works across all TCP applications to reduce bandwidth consumption by up to 99%. Data Streamlining works across Windows file sharing (including MS 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. Data Streamlining also supports rules-based policy administration of optimization classes and packet marking for QoS and route control.

**Transport Streamlining** – RiOS Transport Streamlining reduces the number of TCP packets required to transfer data by up to 98%. Transport Streamlining overcomes TCP limitations by adapting transmission characteristics such as window scale, loss handling, congestion notification, and more. RiOS Transport Streamlining also enables greater utilization of high bandwidth, high latency connections with High-Speed TCP capabilities.

**Application Streamlining** – RiOS 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, RiOS can provide massive throughput increases to applications including Windows file sharing (CIFS), Exchange (MAPI), Web (HTTP), and Database (MS-SQL). RiOS also includes important features for maximizing branch office productivity, such as file server capabilities and transparent pre-population of popular data.

**Management Streamlining** – RiOS simplifies the deployment and management of application acceleration infrastructure by employing a transparent approach to communications. RiOS enables easy deployment through auto-discovery of peers and auto-interception of traffic, with no reconfiguration of clients, servers, or routers necessary. RiOS simplifies ongoing management by providing simple but powerful Web-based and command line interfaces and reporting, as well as the integrated, centralized management and configuration. RiOS also enables a host of additional management features including dozens of deployment configurations, capabilities for redundancy, optional IPsec encryption, RADIUS/TACACS+ authentication, and SNMP traps.

### RIVERBED DEPLOYMENT BENEFITS

Deploying Riverbed with Microsoft Exchange provides multiple benefits, including:

- **Improved productivity.** Microsoft Exchange over the WAN can now be significantly accelerated. By dramatically reducing the time needed to complete the most typical operations, users can save valuable time each day.
- **Faster, more efficient collaboration.** Teams at distributed locations are now able to collaborate more fluidly by taking advantage of the accelerated email retrieval speeds.
- **Reduced bandwidth utilization.** Steelhead appliances significantly reduce bandwidth utilization for remote offices accessing an Exchange Server over the WAN, thus enabling more effective use of existing bandwidth.
- **Simpler Exchange deployment.** Steelhead appliances enable accelerated performance to remote offices from a central Exchange server. Multiple Exchange instances and complex replication models can be consolidated to the data center without compromising performance to even the most remote branch.

## Conclusion

By optimizing the performance of Microsoft Exchange over the network, users can defer upgrading bandwidth to support Exchange processes and may also be able to leverage a smaller and less expensive network connection. Depending on the distances involved, this could result in significant savings. Riverbed also can help maintain a centralized Exchange deployment model which can effectively service distributed workers. This can result in reduced IT maintenance costs. Riverbed WAN optimization solutions enable enterprises to maximize the benefits of Exchange across a distributed environment by providing a very positive and productive user experience, when accessing an Exchange server over a WAN.

## About Riverbed

Riverbed Technology is the IT infrastructure performance company. The Riverbed family of wide area network (WAN) optimization solutions liberates businesses from common IT constraints by increasing application performance, enabling consolidation, and providing enterprise-wide network and application visibility – all while eliminating the need to increase bandwidth, storage or servers. Thousands of companies with distributed operations use Riverbed to make their IT infrastructure faster, less expensive and more responsive. Additional information about Riverbed (NASDAQ: RVBD) is available at [www.riverbed.com](http://www.riverbed.com)



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