

# Riverbed<sup>®</sup> Steelhead<sup>®</sup> Product Family



## Overview

Companies of all sizes depend on the Riverbed® Steelhead® product family to accelerate the performance of applications over the WAN.

Steelhead products deliver the highest performing and most scalable WAN optimization solutions available, overcoming both bandwidth and latency problems to deliver LAN-like performance to branch offices or mobile workers across the globe.

With Riverbed, users are more productive, data moves faster, and applications perform seamlessly. Riverbed Technology brings the world closer, changing the way people work.

## Accelerating Applications for the Global Workforce

Riverbed Technology Steelhead products accelerate application performance and data transfer over the wide area network (WAN), overcoming bandwidth and geographical limitations to improve productivity and enable global collaboration. With Riverbed, file transfers that once took hours or minutes, now take minutes or seconds.

Workers today need access to information wherever and whenever they work – whether at corporate headquarters, a branch office on another continent, or on-site with a customer. The demand for anywhere / anytime access to data puts tremendous strain on IT to deliver an increasing number of applications over the WAN.

Riverbed's award-winning WAN optimization solutions strategically enable IT to centralize and reduce operational overhead and expense, while improving end-user satisfaction. Riverbed's products have been proven in some of the most demanding and complex networks in the world, with thousands of customers deploying Steelhead WAN optimization solutions.

## The Riverbed Steelhead Product Family



**Steelhead CX** – Dedicated WAN optimization appliances featuring Riverbed Operating System (RiOS®) WAN optimization software. Available as small office, midsize office, large office, or data center appliances.

**Steelhead EX** – Enterprise-class branch office appliances featuring RiOS WAN optimization software and a VMware-based virtual services platform (VSP). Available as small office and midsize office appliances.

**Steelhead EX + Granite** – The ultimate branch office appliance featuring RiOS WAN optimization software, a VMware-based virtual services platform (VSP), and Riverbed Granite™, the virtual

edge of a data center. Granite is a block-storage optimization module running on VSP that allows end users and applications in branch offices to read and write to centralized data over the WAN as if it were local in the branch.

**Steelhead Mobile** – A software-based version of Steelhead for laptops and mobile devices.

**Virtual Steelhead** – Virtual edition of a Steelhead appliance.

**Cloud Steelhead** – Virtual edition of Steelhead for deployment in a public cloud such as Amazon EC2.

## Key Benefits

### Acceleration of key enterprise applications

Riverbed Steelhead products accelerate the broad set of applications important to business. Riverbed application modules, combined with the company's data streamlining and transport streamlining, deliver dramatic performance increases across the WAN for all TCP applications, by up to 100 times.

### IT infrastructure consolidation and virtualization

Consolidate file, email, and application servers, and storage from remote branches to cut costs and operational complexity without sacrificing performance. Deploy virtual servers, desktops, and applications with reduced bandwidth requirements and response times, improving the end user experience.

### Reduced bandwidth utilization

Companies that have deployed Riverbed Steelhead products typically reduce bandwidth utilization by 60-95 percent, often allowing them to defer costly network bandwidth upgrades.

### Enhanced data protection

Organizations can eliminate remote backup infrastructure and remediate the risk of data disclosure through lost tapes or media. By speeding data transfer, Riverbed enables speedy, resilient, and secure replication and backup over the WAN, often reducing replication times from hours to minutes.

### Secure application acceleration

Riverbed is the only company that can optimize SSL traffic without compromising the end-to-end trust model. Companies subject to compliance regulations such as SOX, HIPAA, PCI, or other security requirements can deliver both performance and security for their applications.

### Visibility and analytics

Riverbed gives the visibility needed in order to determine where problems exist, analyze how those problems can be addressed, and then tune infrastructure in order to best solve those problems. Complete WAN optimization solutions not only provide order of magnitude performance improvements, but the ability to measure and monitor those improvements across optimized locations and sites that could benefit from further optimization.

### Enable the mobile workforce

Mobile workers often receive sub-optimal application performance when they connect to resources from remote locations. With Steelhead Mobile, IT can deliver local performance to remote workers wherever they connect.

### Virtual Steelhead appliance for custom deployments

Whether organizations need to support ruggedized environments or need elastic capacity for their Steelhead deployment, the virtual Steelhead appliance fits the bill. The virtual Steelhead appliance also provides dual-ended virtualization capability wherein organizations can migrate their infrastructure to a public cloud without sacrificing application performance.

## The Riverbed Difference: Speed, Scalability, Simplicity

### Speed



Riverbed Steelhead products address performance limitations using a multi-tiered optimization approach. Unlike older generation technologies, such as wide area file services (WAFS) or file caching, Steelhead products optimize traffic using a patented application agnostic algorithm to achieve massive-scale data deduplication. The Riverbed solution

layers TCP and UDP optimization as well as application protocol optimization on top of its data reduction technique to deliver a multi-tiered optimization strategy that sets the technological high-bar for WAN optimization, and delivers unparalleled application acceleration over the WAN.

### Scalability



Riverbed's universal data store provides greater scalability than per-peer storage models and reduces WAN optimization storage requirements. By avoiding the per-peer storage limitation, companies can easily scale to hundreds of sites with any-to-any connectivity. Steelhead products also utilize a TCP-based transport, which avoids the pitfalls of running a

proprietary transport on a shared network. The Steelhead product family supports up to 12 Gbps of optimized throughput and 1 million concurrent connections. The product family is one of the most scalable in the industry. With the RiOS-aware Riverbed Interceptor® product, connections are always re-directed to the correct Steelhead appliance in a cluster, to ensure maximum performance. The 7050 series of Steelhead appliances also ensure easy integration into disaster recovery environments that require massive scalability and performance.

### Simplicity



Companies can deploy Steelhead products in a matter of minutes. Steelhead deployments can be performed from a single console with virtually plug-and-play installations, and the Riverbed solution does not require any changes to clients and servers nor the use of specific routing protocols. Steelhead products have been proven in a broad range of

network environments alongside VoIP, video conferencing, and QoS, giving customers flexibility and seamless integration with the existing infrastructure.

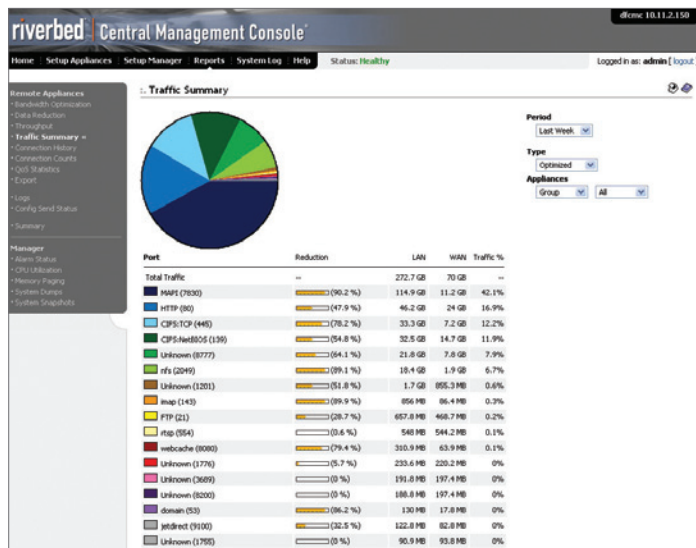
### Accelerate Key Enterprise Applications

- Steelhead products optimize TCP- and UDP-based applications through a multi-tiered optimization approach.
- Riverbed delivers specific application acceleration modules for CIFS, MAPI, Notes, HTTP/HTTPS, NFS, Oracle Forms and MS-SQL.
- An easy-to-use GUI provides dashboard visibility of WAN traffic and optimization status.

## Technological Leadership to Enable Your Business

Riverbed Steelhead products have been proven to dramatically accelerate application performance in some of the most demanding customer environments. Our customers range from the Fortune 50 and Global 1000, to companies with one office.

Riverbed’s award-winning products have consistently proven themselves as the highest performing WAN optimization solutions, consistently earning recognition as the “Technology of the Year - WAN Accelerators” by InfoWorld for six years running, and have been positioned by Gartner in the leaders quadrant in the “Magic Quadrant for WAN Optimization Controllers” report.



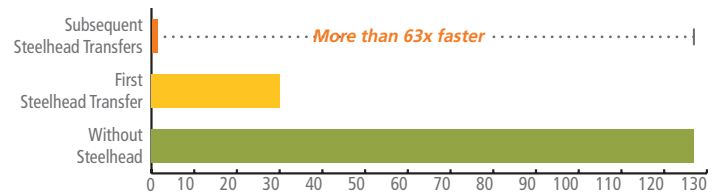
“Our files and data now move more than 70 times faster between offices, giving us the ability to complete projects more quickly.”

*Bruce Bartolf, CTO, Gensler*

### IT Infrastructure Consolidation - The Performance Trade-Off

Many organizations are looking to consolidate their IT infrastructure as a way to simplify management, increase resource utilization, and reduce costs. Unfortunately, the consolidated IT model can often result in diminished application performance and a hit to user productivity that offsets any consolidation cost savings. Riverbed Steelhead products allow users to access consolidated IT resources without trading off performance.

Boomerang Email: 6.4 MB email attachment over T1 WAN - Time to Complete (in seconds)



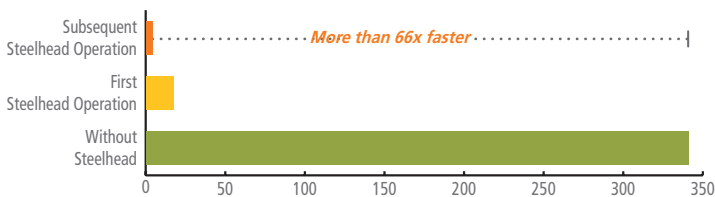
### Moving into the Cloud

Whether companies are consolidating their IT infrastructure to create a “private cloud” infrastructure or outsourcing their infrastructure to Infrastructure as a Service (IAAS) or Platform as a Service (PAAS) vendors that provide “public cloud” infrastructure, the limitations on bandwidth and latency still remain. End users are far away from the data and applications they are trying to access, which results in poor user response and inefficient data delivery. Deploying WAN optimization appliances is a great way to defeat both these problems, while saving money on costly bandwidth upgrades. In short, WAN optimization can be the driving force to enable consolidation to public or private cloud architectures.

## The Stateless Branch Office

Companies are approaching consolidation and virtualization of IT in branch offices in two ways. First, moving servers and storage out of the branch and into data centers where it can be more efficiently aggregated and managed, and then delivering access back to end users across the WAN. Second, taking local branch office servers and virtualizing them to run directly on VMware on the Steelhead appliances that are already deployed in every site, for edge services like printing or security. With no more complex build outs or remote servers to buy, install and manage, branches get set up faster and leaner, administrative overhead decreases, and users are more productive.

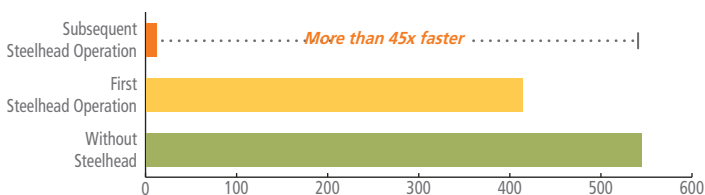
CIFS File Share over T1 WAN – Time to Complete (in seconds)



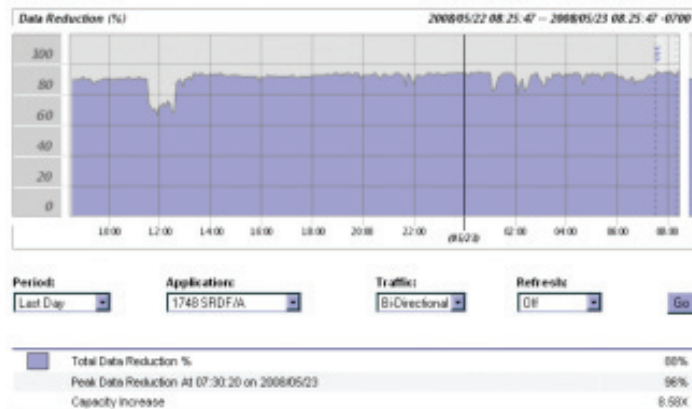
## Enhanced Data Protection - The New Paradigm

Headline stories about tapes falling off trucks and the potential leakage of sensitive data have become all too common for both the enterprise and the consumer. CxOs require assurance that sensitive data will remain private and are looking for ways to reduce their data loss risk. With Riverbed, organizations can perform WAN-based backups or data replication without struggling to finish jobs in a tight backup window. Most enterprise storage vendors' solutions, including EMC and HDS, are already supported and previously unacceptable performance on the WAN can be improved by over 30 times with enhanced support for protocols such as FCIP and SRDF/A.

NetApp SnapMirror Full Datastore Initialization or Recovery (5GB Directory Tree) Over T1 WAN – Time to Complete (in minutes)



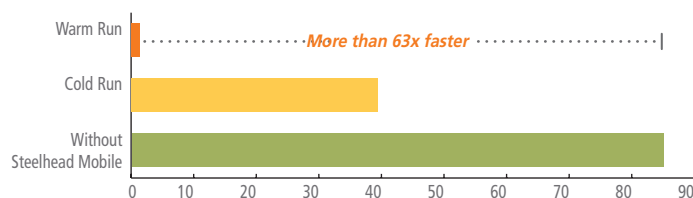
With accelerated replication, customers can also take more frequent snapshots and dramatically improve their recovery time in the event of a failure. Riverbed has advanced features for high end data center to data center disaster recovery, including special enhancements for more optimized throughput, tunable compression, and clustering for high availability and scalability. Customers can “fill the pipe” for high bandwidth environments maximizing speed, or choose to adopt higher compression, deduplication, and QoS to limit the impact on bandwidth for other applications on a shared WAN.



## Enabling the Mobile Workforce

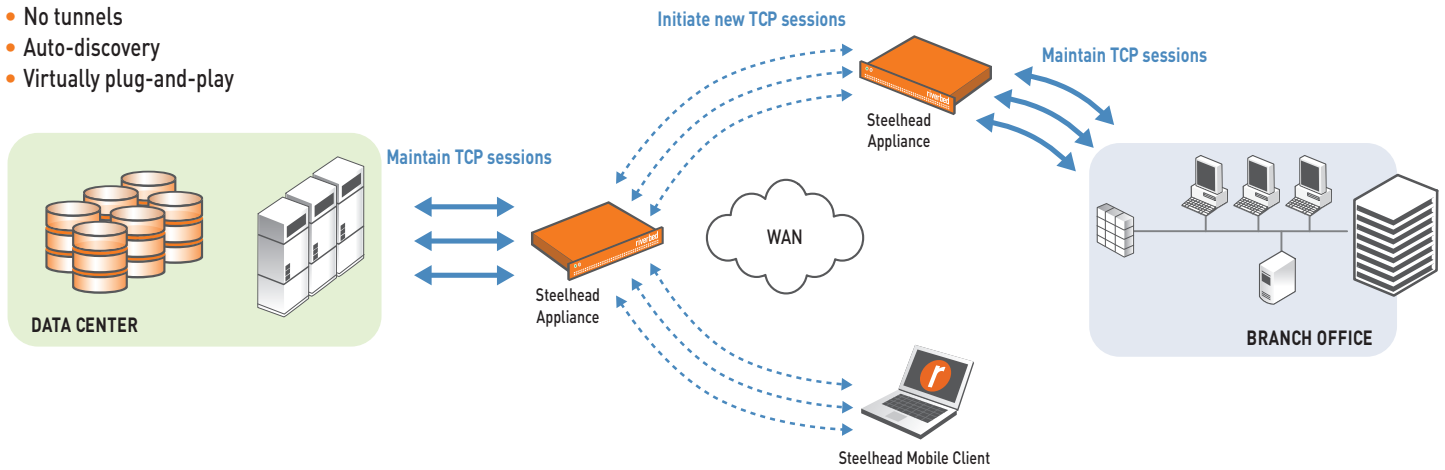
IT has often struggled to support remote users who need access to corporate data and applications, and mobile users have come to expect sub-optimal performance when they work remotely. Steelhead Mobile software extends Riverbed's award-winning technology to any PC or laptop to deliver acceleration wherever users connect. With Steelhead Mobile, applications run faster and remote workers are no longer “remote.” Desktop virtualization solutions can also be optimized for use on the WAN.

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



### The Riverbed Framework

- No tunnels
- Auto-discovery
- Virtually plug-and-play



### The Riverbed Optimization System (RiOS)

RiOS software powers Steelhead products through a combination of patented data reduction, TCP and UDP optimization, and application-level protocol optimizations. Together, these technologies, along with RiOS management capabilities, provide a comprehensive solution for enterprise WAN optimization. RiOS consists of four key components:

**Data streamlining** – RiOS data streamlining works across all TCP and UDP applications to reduce bandwidth utilization, typically by 60-95 percent. Data streamlining works across file sharing, email, CAD, ERP, VDI, web-based HTTP and HTTPS applications, databases, and all other applications that use TCP and UDP.

**Transport streamlining** – RiOS transport streamlining reduces the number of TCP packets required to transfer data by 65-98 percent. Transport streamlining also enables the acceleration of SSL-encrypted traffic throughout the enterprise to eliminate the security and performance trade-off. With HS-TCP and MX-TCP, RiOS can enable greater utilization of high bandwidth links (i.e. long fat networks (LFN) such as OC3, OC12, metrofiber).

**“Without Riverbed, we would have had to make a substantial investment in bandwidth. Now, we are saving an average of USD \$144,000 per month and have seen a return on investment within seven months.”**

*Riad Mounir, Director of IT, Zain Group*

**“Steelhead appliances cut WAN-based backup windows from 16 hours to just 6 hours. This enables us to do more frequent, more reliable backups.”**

*Rakesh Patel, Technical Architect, Liz Claiborne*

**Application streamlining** – RiOS application streamlining offers the broadest support of application-specific modules for key enterprise applications to provide additional application performance improvements on top of the data streamlining and transport streamlining optimizations performed on all TCP traffic. By reducing application protocol chattiness up to 98 percent and minimizing application overhead, RiOS can provide massive throughput increases to applications including file sharing (CIFS and NFS), Exchange (MAPI), Lotus Notes, Web (HTTP and HTTPS), database (MS-SQL and Oracle) and storage protocols like FCIP and SRDF/A (EMC).

**Management streamlining** – RiOS enables easy deployment through auto-discovery of peers and auto-interception of traffic, with no reconfiguration of clients, servers, or routers. Many customers deploy Steelhead products in minutes and RiOS simplifies ongoing management by providing simple, but powerful web-based and command-line interfaces, in-depth reporting and real-time NetFlow export. Simple integration into the network has led to Riverbed deployments in a vast array of network environments and topologies including, but not limited to, MPLS, VoIP, video conferencing, QoS, VPN, satellite infrastructure, ATM, frame relay, microwave, and wireless.

## Key Features

### Steelhead Appliances

- **Cost-effective deployment** – Appliance models that scale to meet the deployment needs of any office
- **Application acceleration** – Accelerate the broadest range of applications that are critical to business
- **Simplicity** – Transparently deploy in minutes without changes to applications, users, routers, or other IT infrastructure
- **Scalability** – One of the most scalable acceleration solutions available on the market, supporting thousands of users on one device

### Virtual Steelhead Appliance

- **Fully virtualized data centers** – Leverage your existing investment in virtualization to manage Virtualized Steelhead appliances.
- **Space limited deployments** – Deploy WAN optimization without the hardware
- **Ruggedized environments** – Seamlessly integrate into a ruggedized form factor for military environments
- **Increase capacity on-demand** – Scale capacity without requiring a forklift upgrade.

### Steelhead Mobile Software

- **Acceleration directly to any PC** – Mobile workers, home offices, and very small branch offices
- **Fully transparent** – Deploy without any input, management, or monitoring from end users. Transparent to network connectivity or VPN.

### Steelhead Interceptor

- **Massive scaling** – With the optional Interceptor, enterprises can enable massive clustered deployments of Steelhead appliances. Up to 12 Gbps of throughput and up to 1,000,000 concurrent connections can be optimized simultaneously.
- **Support complexity** – Enable complex redundant deployment, even in environments with asymmetric routing

### Cloud Steelhead

- **Embrace the Public Cloud** – Cloud Steelhead transforms the public cloud into an extension of the corporate data center by eliminating the barriers to enterprise-class public cloud deployments. Compatibility with Amazon Web

Services and ESX-based cloud environments eliminates vendor lock-in by giving organizations the freedom to move between cloud providers with ease.

- **Pay as you Grow** – A subscription pricing model and a host of cloud intelligent features enable organizations to meet application performance SLAs, regardless of network latency and enterprise

### Virtual Services Platform (VSP)

- **Server virtualization** – The Steelhead EX series allows organizations to run virtual machines for applications such as printing, DNS, DHCP, security, and streaming media on a VMware platform
- **“Branch office in a box” consolidation** – Eliminate other server hardware while still delivering high quality local “edge” services to the branch office
- **High availability** – Support for high availability for virtual machines running on the RSP platform
- **Management via CMC** – Management for the RSP platform is integrated into the Central Management Console (CMC)

### Central Management Console

- **Deployment** – Enable touchless configuration of new appliances. Control policies, optimization rules, QoS configuration, and more.
- **Management** – Enable a single management interface for enterprise deployments of Steelhead appliances. One-touch software upgrades, health alerts, job scheduler and optimization performance can all be controlled centrally.
- **Visibility** – Enables real-time visibility into application and WAN performance. Configure reporting and policies for Netflow export.
- **Virtual Edition (-VE)** – Can be hosted on a hypervisor as a virtual machine.

### Steelhead Mobile Controller (SMC and SMC-VE)

- **Deployment** – Enable automated deployment of Steelhead Mobile onto remote machines. Control policies, optimization rules, and more.
- **Management** – Access a single-source for monitoring and license management. One-touch software upgrades, health alerts, and optimization performance can be controlled centrally.
- **Visibility** – Enables real-time visibility into application and WAN performance. Customizable reporting is available.
- **Virtual Edition (VE)** – Can be run on the RSP for small environments.

## Additional Features

### Network Integration and Deployment Options

- **Transparency** – Export real-time flows from a Steelhead appliance to a third-party Netflow collector (including v.9), giving full visibility into WAN traffic by source, destination, IP address, application port, and more
- **Auto discovery** – Appliances automatically find in-path peers in the network, with no tunnel configurations required
- **Deployment** – Installs transparently in-line or as a “one arm” attachment to routers/switches with direct configuration, WCCP, PBR, and L4 switch redirection modes
- **Multi-port interfaces** – 4 Port GigE Card available (optional on all rackable models); Up to 3 cards (12 ports total) per Steelhead appliance
- **Asymmetric routing** – Asymmetric route detection and connection forwarding for support of route asymmetry on both the client and server sides
- **Network agnostic** – Full mesh, hub and spoke, and multi-drop topologies supported; MPLS, IP VPN, Satellite, Frame, ATM and any other IP transport supported
- **Seamless integration** – Works easily with existing QoS, VoIP, video conferencing and other real-time traffic

### Management and Policy

- **Configuration** – Web UI, CLI, and Central Management Console (CMC), Steelhead Management Console (SMC)
- **Marking** – DSCP, port, and VLAN mapping and/or preservation. Automatic port-to-application mapping for reporting
- **Reporting** – Robust real-time performance statistics gathering, export, and graphical reporting; local, CMC, SMC, and Syslog logging; report on traffic by QoS class, application, and more; SNMP support

- **Optimization policy** – Per-application admission and optimization controls
- **Bandwidth management** – HFSC-based QoS allows for application prioritization, low-latency queuing for VoIP; settable WAN bandwidth rate controls included

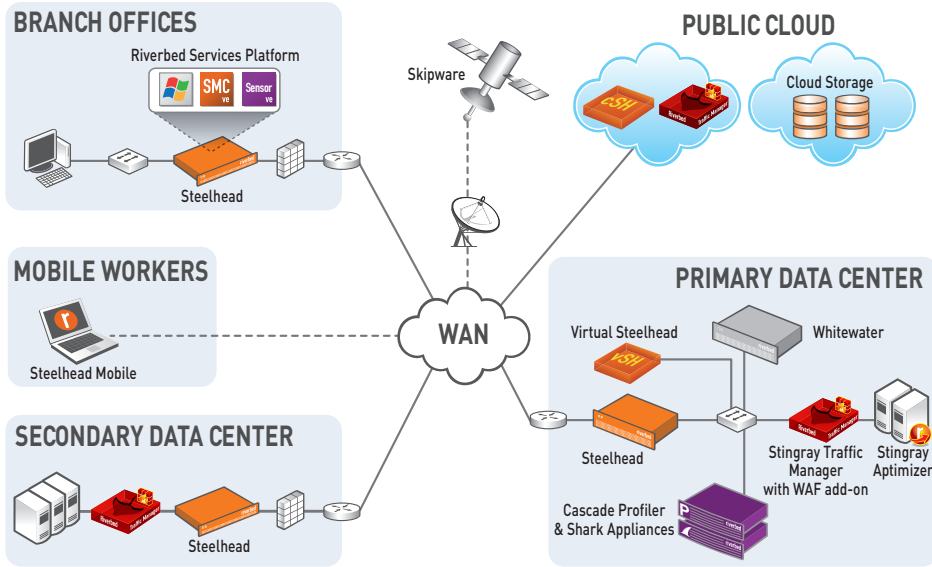
### High Availability

- **Clustering** – Serial (in-path), parallel (out-of-path), or virtual in-path clustering for massive scalability
- **Fail-to-wire** – Ensures no loss in network connectivity in the event of device failure
- **N:1 and 1:1 redundancy** – Hot-standby redundancy and N:1 clustering
- **Redundant disk and power** – Available RAID and dual power supplies on larger models
- **Dual image SW upgrades** – Schedule over-the-wire software upgrades with dual image, rollback, and scheduled restart/reboot
- **Fault Tolerant Solid State Disks (SSDs)** – In the 7050 series of Steelhead appliances for combining high availability and higher performance

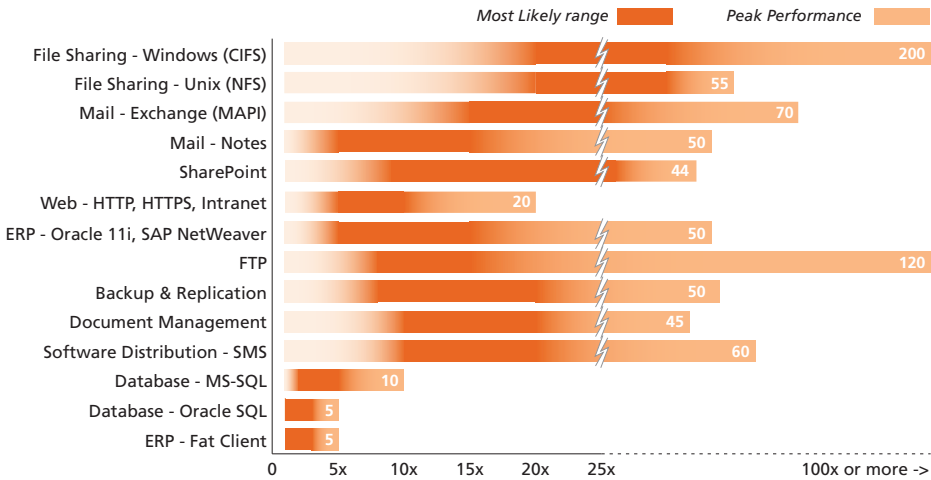
### Security

- **SSL acceleration** that maintains traffic encryption without breaking the preferred trust model
- **RADIUS and TACACS+ support** for authenticating access
- **Configurable SSL encryption** for WAN traffic
- **Secure registration** ensures only approved devices communicate with the central management console (CMC)
- **Support for Microsoft Online** and other online services from Microsoft

Comprehensive Riverbed Product Deployment



Steelhead Products Accelerate a Broad Range of Applications



About Riverbed

Riverbed delivers performance for the globally connected enterprise. With Riverbed, enterprises can successfully and intelligently implement strategic initiatives such as virtualization, consolidation, cloud computing, and disaster recovery without fear of compromising performance. By giving enterprises the platform they need to understand, optimize and consolidate their IT, Riverbed helps enterprises to build a fast, fluid and dynamic IT architecture that aligns with the business needs of the organization. Additional information about Riverbed (NASDAQ: RVBD) is available at [www.riverbed.com](http://www.riverbed.com).



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