

# STEELHEAD™ APPLIANCES

## Leading-Edge Performance for Wide Area Data Services

Riverbed Technology's Steelhead appliances deliver the only complete solution for Wide-area Data Services (WDS) essential to the distributed enterprise.

By deploying Steelhead appliances, enterprises can for the first time accelerate all applications used over wide area networks.

At the same time, enterprises can consolidate previously distributed servers, storage, and backup infrastructure, while maintaining the LAN-like performance users demand.

### KEY BENEFITS

**Acceleration of All TCP Applications.** Steelhead appliances deliver dramatic performance increases across the Wide Area Network (WAN) for all TCP applications, some by as much as 100 times. With Steelhead appliances, secure backups over the WAN take minutes instead of hours, and distributed teams can collaborate more effectively by getting updated files and emails in seconds instead of minutes or hours.

**Consolidation of IT Infrastructure.** Steelhead appliances enable the consolidation of file servers, Exchange servers, storage and tape backup systems from remote branches into data centers, without giving up the performance users need.

**Scalability for the Distributed Enterprise.** Steelhead appliances are designed to meet the needs of organizations of any size – from a few sites to thousands. For both full-mesh and hub-and-spoke topologies, Steelhead appliances can scale to support networks with thousands of remote sites. Steelhead appliances can also be clustered at the data center for high reliability and greater remote site fan-out.

**Ease of Deployment.** Across the WAN, Steelhead appliances can automatically detect each other and begin optimizing data without the need to set up routes or tunnels. Steelhead appliances can be deployed in-path or out-of-path, and include support for host, WCCP, and Policy-Based Routing configurations. Even in topologies with MPLS, multiple WAN links, or asymmetric routes, Steelhead appliances communicate with each other to determine the path that provides the highest level of optimization.

**Robust Central Management.** Riverbed's optional Central Management Console (CMC) simplifies remote site appliance management and provides the performance reporting capabilities needed to ease the burden on centralized IT resources. To simplify management of remote sites, Steelhead appliances can discover the CMC and pull down their configuration files automatically.



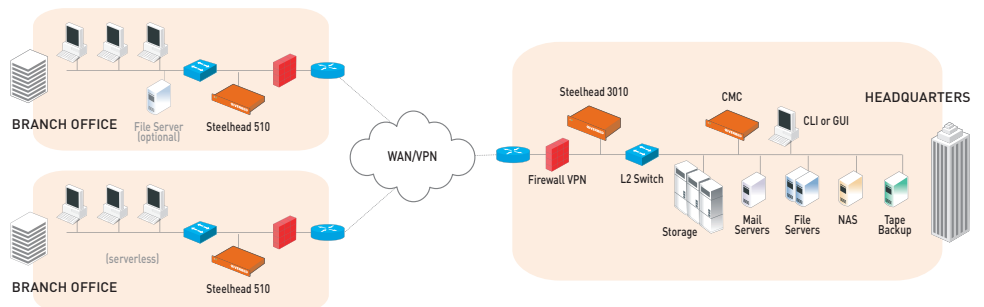
### WIDE AREA DATA SERVICES (WDS) FEATURES

Steelhead appliances leverage a combination of patented data reduction, TCP optimization, and application-level throughput optimizations, as well as remote office file and management functionality, to provide a comprehensive solution for WDS that scales across a broad range of applications and network topologies.

- **Scalable Data Referencing (SDR)** – Riverbed's SDR algorithms work across all TCP applications including Microsoft Office, Lotus Notes, CAD, ERP, NFS, FTP, and HTTP, to ensure the same data is never sent more than once over the WAN. SDR reduces bandwidth consumption for many applications dramatically, typically by 60% to 95%, and sometimes more.
- **Transparent Pre-Population** – Appliance data stores can be automatically and transparently pre-populated with new file system data or email data to accelerate the initial access to this data by the client.
- **Application-Specific Optimizations** – Steelhead appliances minimize the impact of WAN latencies on applications. By minimizing round trips and payloads generated at the application layer, Riverbed provides additional order-of-magnitude throughput increases to applications including Windows file sharing (CIFS), Exchange (MAPI), Web (HTTP), Database (MS-SQL), FTP, and backup and replication.

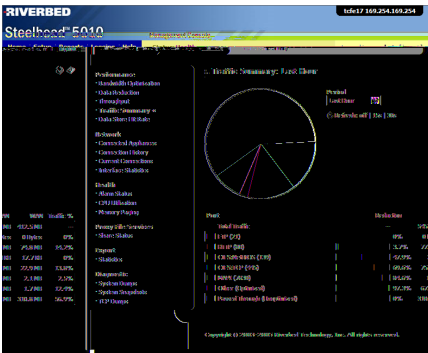


Riverbed Steelhead: Best WAN Accelerator  
InfoWorld Technology of the Year



Typical Steelhead Deployment

# STEELHEAD APPLIANCES



- **Virtual Window Expansion (VWE)** – VWE enables applications to overcome TCP windowing limitations to dramatically increase the amount of data that can be sent in a single round trip.
- **High-Speed TCP (HS-TCP)** – For high latency, high bandwidth links, unaided TCP often fails to fill the link leaving much of the WAN bandwidth unusable. HS-TCP is available on the Steelhead 5010, and supports up to 750 Mbps per connection for blazing fast data replication and backup.
- **Proxy File Service (PFS)** – PFS enables remote office workers local access to files even when the WAN link to the office goes down. PFS also enables remote office file shares to be replicated automatically to the data center, ensuring reliable backup.
- **Policy and Security** – Steelhead appliances support rules-based policy administration of optimization classes and packet marking for QoS and route control. Steelhead appliances also support packet filtering, optional IPsec encryption, and RADIUS/TACACS+ authentication.

## SPECIFICATIONS

Optimization	
<b>Data Reduction</b>	Scalable Data Referencing with Transparent Pre-Population
<b>Latency Optimizations</b>	Application-specific optimizations to reduce effects of application chattiness
<b>TCP Optimizations</b>	Virtual TCP window expansion, High-Speed TCP, Explicit Congestion Notification, Limited and Fast Re-Transmits, Adaptive Initial Congestion Windows, Selective and Delayed Acknowledgements, TCP Timestamps and window scaling, Congestion window validation
<b>Disconnected Operation</b>	Proxy File Service (PFS) with local share replication
<b>Connection Pooling</b>	Optimizes protocols such as HTTP with many short-lived connections
<b>Other</b>	Automatic peer discovery and true bi-directional operation
Management and Policy	
<b>Configuration</b>	Web UI, command line interface, and Central Management Console (CMC)
<b>SNMP</b>	SNMPv2 support for monitoring and statistics gathering via MIB II and enterprise MIB
<b>Comprehensive Logging</b>	Local, CMC, and Syslog support with configurable logging levels
<b>Marking</b>	DSCP, port, and VLAN mapping and/or preservation
<b>Reporting</b>	Robust performance statistics gathering, export, and graphical reporting
<b>Policy</b>	Per-application admission and optimization controls
<b>Rate Limiting</b>	Settable WAN bandwidth rate controls
Network Integration and Scalability	
<b>In-path</b>	Installs transparently in-line and provides automatic fail-to-wire
<b>Out-of-path</b>	“One arm” attachment to routers/switches with direct configuration, WCCP, policy based routing, and L4 switch redirection modes
<b>Multi-port Interfaces</b>	4 Port GigE Card available (optional, all models). Up to twelve Ethernet ports per Steelhead appliance (3010 and 5010) support scalability and redundant WAN router and switch configurations
<b>Asymmetric Routing</b>	Connection forwarding for support of incoming and outgoing route asymmetry
<b>Network Topology</b>	Full mesh, hub and spoke, and multi-drop topologies supported
<b>Clustering</b>	Serial (in-path), Parallel (out-of-path), or Virtual In-Path clustering for massive scalability
High Availability and Security	
<b>Fail to Wire</b>	Dual watchdog timers ensure no loss in network connectivity in the event of hardware or software failure
<b>N:1 and 1:1 Redundancy</b>	Hot-standby redundancy and N:1 clustering for in-path and out-of-path configurations
<b>Redundant Disk and Power</b>	Available RAID and dual power supplies protect the system from hard drive or power supply failure
<b>Authentication</b>	RADIUS and TACACS+ support for authenticating access
<b>Encryption</b>	Configurable IPsec encryption for Steelhead to Steelhead communications
<b>Dual Image SW Upgrades</b>	Scheduled over-the-wire software upgrades with dual image, rollback, and scheduled restart/reboot

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## STEELHEAD MODELS

	Steelhead 510	Steelhead 1010	Steelhead 2010 / 2510	Steelhead 3010 / 3510	Steelhead 5010	Steelhead Clusters <sup>2</sup>
<b>Profile</b>	1U	1U	1U	3U	3U	n x 3U
<b>Raw Disk Capacity</b>	200 GB	200 GB	400 GB	1000 GB	1500 GB	n x 1500 GB
<b>Data Store Capacity</b>	80 GB	80 GB	150 GB	250 GB	512 GB	n x 512 GB
<b>PFS Disk Capacity</b>	n/a	100 GB	210 GB	210 GB	210 GB	n x 210 GB
<b>WAN Capacity (outbound)<sup>1</sup></b>	512 kbps	2 Mbps	4 Mbps / 6 Mbps	10 Mbps / 20 Mbps	45 Mbps	n x 45 Mbps
<b>Optimized TCP Connections (PFS disabled)</b>	200	625	1300 / 1500	2400	4500	n x 4500
<b>Optimized TCP Connections (PFS enabled)</b>	n/a	200	650 / 750	1300 / 1500	2200	n x 2200
<b>Ethernet Fail Through</b>	•	•	•	•	•	•
<b>RAID</b>				•	•	•
<b>Dual Power Supplies</b>				•	•	•
<b>Hot Swappable Disks</b>				•	•	•
<b>Management Interface</b>	Central management system available + WEB GUI, CLI, SNMP					
<b>Clustering</b>	In-Path (serial), Out-of-Path, or Virtual In-Path (WCCP)					

<sup>1</sup>Inbound (WAN to LAN) Steelhead capacity is unrestricted; <sup>2</sup>Any Steelhead model can be clustered