Resilient Networking for the Edge

Edge Computing enables businesses to perform complex operations at places of production by placing compute resource closer to users and operations. The Edge does not operate stand-alone – it requires data from the core, either data centers or cloud based services, to support the locally generated data. In AI-powered operations, edge data is often acquired across multiple locations and analyzed for updating operational models. Unforeseen outages or degraded connectivity between the edge and central locations can threaten data security and business continuity, leading to the loss of critical business data and operational disruption.

Additionally, high network latency between the edge and central sites can negatively affect application performance. Operations reliant on real-time access to critical business data may face delays that slow down workflows, ultimately reducing business efficiency. This latency may also impacts customer service, as employees may struggle to access the data necessary to resolve customer issues in a timely manner, leading to dissatisfaction.

In AI-enabled environments, disruptions in network connectivity can prevent timely training of AI models. When telemetry from distributed sites is not transmitted in real-time, the performance of large scale AI models suffers. Similarly, degraded communications can delay the sharing of updated AI-driven inference models to edge locations, inhibiting local decision-making and further slowing down operations.

Introducing Riverbed SteelHead RS

SteelHead RS is a resilient and secure edge solution that tackles these challenges and maintains operations, even during network degradation, ensuring business resiliency. This new Riverbed Acceleration solution ensures:

- **Peak Application performance:** Makes data available at the edge to enable peak application performance. Eliminates the need to transfer all the core data to ensure operations continue, reducing risk of data loss.

- **Continuously synchronized data:** Maintains security and data synchronization between the edge and the datacenter and/or cloud.

- **No latency impact:** Overcomes challenges related to latency, data integrity, and security, while keeping operations running smoothly both in the data center and at the edge.

- **Always-on Operations:** Enables the continuity of edge operations when the network is impaired.

- **Maximize network capacity:** Reduces bandwidth usage and improves data transfer speeds between remote and central sites over constrained networks.

- **Reduces upfront and operational costs** of significant storage at edge locations. Lowers risk of operational impact by retaining data gravity in the data center or cloud.

How SteelHead RS Works

SteelHead RS is a solution for edge computing that ensures resilient edge data, delivery, and synchronization. The solution supports secure, centralized data management and ensures high performance at the edge, delivering a seamless experience across distributed environments. SteelHead RS caches frequently accessed data locally at remote locations via BlockStore, ensuring fast performance while data is securely stored in the data center and/or cloud. SteelHead also optimizes WAN traffic using deduplication, compression, and other optimization techniques to reduce bandwidth usage and improve data transfer speeds. This ensures that remote workers at the edge location can access the necessary applications and data quickly and efficiently. By keeping data centralized, SteelHead RS simplifies backup and disaster recovery processes while streamlining management and improving overall resiliency.

Use Cases

- **Manufacturing & Shipping:** Improve operational efficiency by ensuring fast, reliable data access in factories and distribution centers, even in low-connectivity environments.

- **Government & Defense:** Protect sensitive data while maintaining continuous operations in remote or high-security locations that rely on secure, resilient networking.

- **Oil, Gas & Mining:** Enable real-time decision-making and secure data processing in geographically isolated locations with limited network resources.

- **Financial Services & Insurance:** Enhance customer service by ensuring fast, reliable access to critical applications across distributed office locations while maintaining data security and compliance.
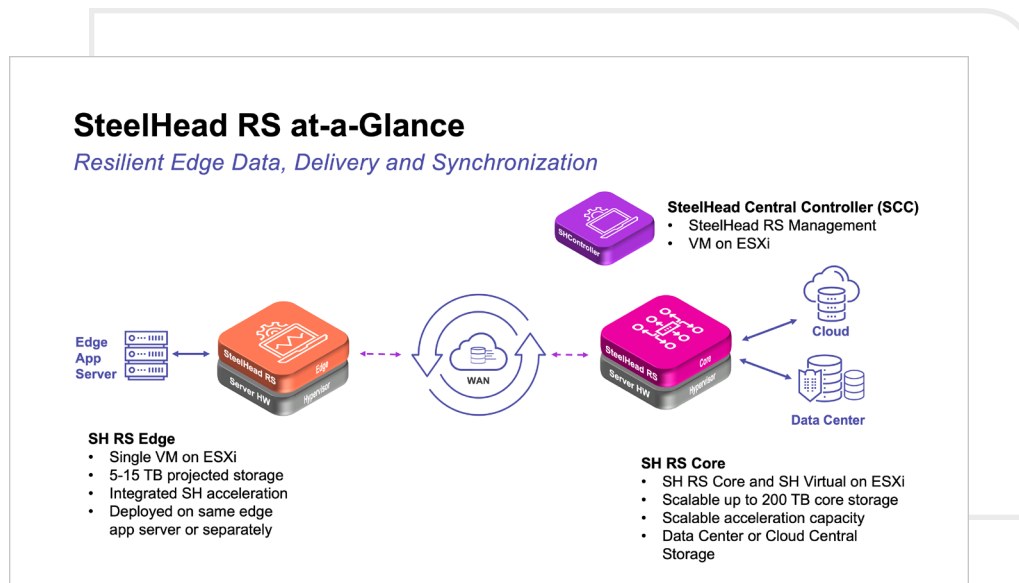
SteelHead RS at-a-Glance
Resilient Edge Data, Delivery and Synchronization

SteelHead Central Controller (SCC)
- SteelHead RS Management
- VM on ESXi

Edge App Server

SteelHead RS Edge

WAN

SteelHead RS Core

Cloud

Data Center

SH RS Edge
- Single VM on ESXi
- 5-15 TB projected storage
- Integrated SH acceleration
- Deployed on same edge app server or separately

SH RS Core
- SH RS Core and SH Virtual on ESXi
- Scalable up to 200 TB core storage
- Scalable acceleration capacity
- Data Center or Cloud Central Storage

Figure 1: Drive peak performance and bolster data security for edge computing environments.

Ensure Edge Resiliency, Data Performance and Security

SteelHead RS Edge

Deployed at remote or branch offices, SteelHead RS Edge is a virtual appliance that integrates server, storage, and WAN optimization functions. It connects the edge site to the data center and delivers near-local performance for applications accessing critical data.

SteelHead RS Core

Located in the data center, SteelHead RS Core acts as a gateway between the data center or cloud storage systems and SteelHead RS Edge devices. It virtualizes storage from the data center and makes it available to edge locations, enabling centralized management of data and storage.

Key Benefits

SteelHead RS delivers business-critical outcomes that help organizations improve their performance and operational efficiency across distributed edge environments. The solution:

- **Enhances Edge Performance:** Improves edge functionality by caching data locally while maintaining synchronization with data centers or the cloud.

- **Maintains Continuous Business Operations:** Provides secure, accelerated edge processing, allowing uninterrupted business operations even during unexpected outages or connectivity issues between remote and central locations.

- **Optimizes Application Traffic:** Leverages advanced optimization techniques like deduplication and compression, reducing bandwidth consumption and accelerating data transfers between remote sites and central locations.

- **Ensures Data Security and Resilience:** Ensures data security at rest and in transit with strong encryption (SSL/IPSEC) and real-time synchronization, enhancing operational resilience against network disruptions.

- **Improves Performance Against RPO and RTO Objectives:** Timely synchronization of data between the edge and central storage minimizes the risk of data loss at remote locations, helping businesses achieve their Recovery Point Objectives (RPO) and Recovery Time Objectives (RTO).

- **Boosts Productivity:** Ensures uninterrupted access to essential applications and data during network issues, allowing employees at edge locations to maintain productivity and deliver consistent performance.

- **Optimizes Data Transfer:** Utilizes SteelHead technology to enhance data transfer between the edge and the core, effectively addressing challenges posed by high-latency, bandwidth-limited, and/or unreliable networks.
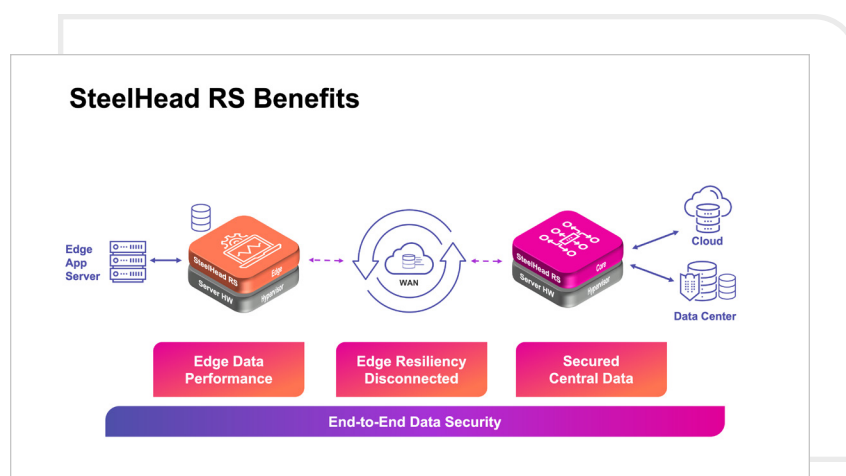

SteelHead RS Benefits

Edge App Server — SteelHead RS Edge (Server HW, Hypervisor) — WAN — SteelHead RS Core (Server HW, Hypervisor) — Cloud / Data Center

Edge Data Performance | Edge Resiliency Disconnected | Secured Central Data

End-to-End Data Security

Figure 2: SteelHead RS delivers the resiliency and performance your business needs to thrive everywhere.

Part of the Riverbed Platform

Riverbed is dedicated to enabling IT organizations to accelerate performance and transform data into actionable insights to drive seamless digital experiences. SteelHead RS is part of the Riverbed platform, which provides optimization and observability to improve user experience and drive business resiliency. Our platform ensures applications run faster and more reliably for users anywhere and enables IT to prevent, identify, and resolve issues.

Discover more about how SteelHead RS can enhance your edge networking capabilities and support business continuity. Contact a Riverbed expert or visit our website to learn more.

About Riverbed

Riverbed, the leader in AI observability, helps organizations optimize their users' experiences by leveraging AI automation for the prevention, identification, and resolution of IT issues. With over 20 years of experience in data collection and AI and machine learning, Riverbed's open and AI-powered observability platform and solutions optimize digital experiences and greatly improve IT efficiency. Riverbed also offers industry-leading Acceleration solutions that provide fast, agile, secure acceleration of any app, over any network, to users anywhere. Together with our thousands of market-leading customers globally – including 95% of the *FORTUNE* 100 – we are empowering next-generation digital experiences. Learn more at riverbed.com.