

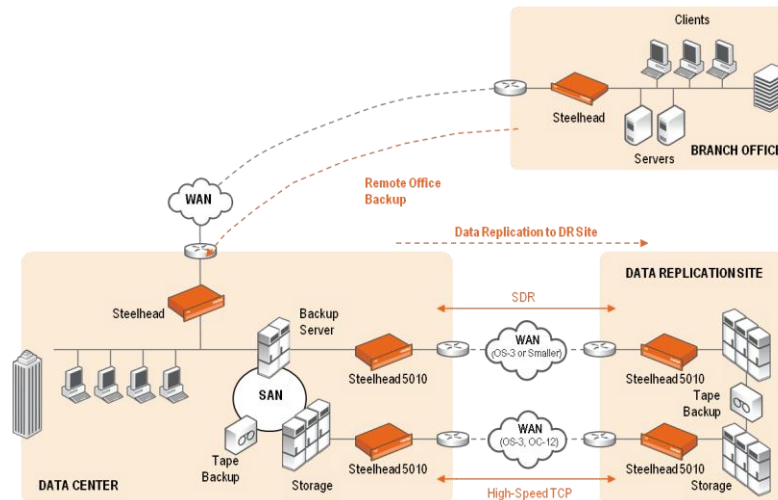
Network-Based Backup and Data Replication

Wide area network (WAN)-based approaches to data backup are dramatically influenced by WAN bandwidth limitations and network latency. Without significant costly WAN bandwidth upgrades, this can make WAN-based backup impossible for large remote offices with significant data stores.

By overcoming bandwidth limitations and optimizing transfers to overcome network latency, Riverbed® Steelhead® appliances have successfully enabled and facilitated network-based backup approaches in the most demanding customer environments. Riverbed technology dramatically optimizes large-scale data backups within distributed enterprises by employing:

- Centralized backup and recovery of servers and desktop machines in remote offices
- Replication of centralized data repositories between data centers
- Backup of files and data to cloud services

Riverbed Steelhead appliance deployment for backup and replication



Riverbed Steelhead appliance technology can dramatically accelerate backup and replication in the branch office and cloud service. At the same time, it can cut bandwidth utilization by up to 95 percent.

BENEFITS

Riverbed accelerates the transfer of data over the WAN for backup and data migration purposes. Through revolutionary technology, we deliver the following capabilities:

- Enables centralized, disk-to-disk backup strategies that simplify remote office backup and data center replication.
- Reduces backup windows and transfer times to maximize application availability
- Effectively increases WAN capacity by detecting and avoiding the transfer of repetitive data patterns over the WAN
- Boosts TCP performance up to 1 Gbps to fully-utilize high-speed WAN links
- Improved and consistent performance for SRDF/A and FCIP over the WAN

Centralized Backup and Recovery

To meet the demands of the global marketplace, enterprises must support employees and computer resources that are distributed throughout the world. When critical data is no longer hosted at just one physical location, the challenge of backing up and securing data is magnified. Traditional approaches involve deploying tape backup equipment and processes to each location that hosts data, and hiring or contracting local resources to manage these resources. This can be a tenuous proposition at best, while for some enterprises it's a completely unrealistic option.

Riverbed makes network-based backup feasible, in many cases through use of existing WAN links, without the need for bandwidth upgrades. Network-based backup allows for host- or array-based backup programs that transfer data into the data center, private or public cloud, where it can be placed onto tape or other secondary storage media. Backup data is then more secure and accessible in the event of a restoration event. Riverbed optimizes the regular transfer of backup data over the WAN into the data center, and accelerates commercial backup software packages by eliminating the transfer of redundant data and minimizing the effects of latency on data transfer. Riverbed's approach eliminates data redundancy across applications or servers as well, going well beyond other data reduction mechanisms found in other storage replication products. This reduces backup windows by up to 90 percent and eliminates up to 95 percent of data that typically has to be copied across the WAN.

Replication of Centralized Data Repositories – in the Private or Public Cloud

An effective disaster recovery (DR) strategy requires that all data be stored redundantly at multiple physical locations. In the event of a disaster that destroys data stored at one location, there will always be a second, redundant copy of the lost data at a different physical location. Such a strategy ensures that a single cataclysmic event, such as hurricane, flood, or terrorist act, will never destroy all the data that a corporation has.

Implementation of an effective DR strategy requires a data replication solution capable of transporting large amounts of data over the long distances required for geographical diversity in the data storage sites. Riverbed speeds data replication solutions to transfer significant amounts of data over the WAN to the DR site. That site can be a regional office, another data center, or even a public cloud service being used as a backup data center. Riverbed supports software server-based data replication solutions, as well as those using fiber channel SANs with FCIP or iFCP.

The Riverbed Solution

Riverbed accelerates data transfer over the WAN, allowing backup and replication to be 5 times, 50 times, or even 100 times faster. Through its revolutionary WAN optimization technology, Riverbed delivers the following capabilities:

- Enables centralized, disk-to-disk backup strategies that simplify remote office backup and data center replication
- Reduces backup windows and transfer times to maximize application availability
- Effectively increases WAN capacity by detecting and avoiding the transfer of repetitive data patterns over the WAN
- Boosts performance to fully-utilize high-speed WAN links

Riverbed's data streamlining typically yields data reduction ratios of 5:1 or greater for the common enterprise workloads seen in SRDF environments. The scalable data reduction (SDR) operation can be performed interchangeably on the Steelhead appliance, either on disk (as SDR – for more matches and greater data reduction), in memory (as SDR-M – for faster throughput), adaptively in either location, or both (as SDR-A) for the best fit of each particular connection's data and overall workload. This functionality dynamically and granularly maximizes the efficient utilization of available resources such as CPU, disk, and memory.

Riverbed has intelligent storage-specific optimizations that yield higher data reduction ratios for the common enterprise workloads seen in SRDF/A environments at both the network and application level, enabling enterprises to realize up to a 30:1 compression while maintaining a high throughput. The optimizations include

- SRDF/A Optimizations – Riverbed customers that use EMC's Symmetrix V-MAX and DMX will benefit from improved data reduction and throughput due to the enhanced SRDF/A optimizations in RiOS 6.1.
- FCIP Optimizations – RiOS 6.1 provides both network- and application-based optimizations for FCIP traffic over MDS gateways.

These enhancements speed FCIP traffic to and across the network on both protocol and network levels.

In addition to reducing WAN utilization, the Steelhead appliance includes extensive hierarchical quality of service (QoS) capabilities to ensure that SRDF/A traffic receives the appropriate guaranteed level of WAN bandwidth and latency. This provides SRDF traffic with priority access to the network infrastructure required to ensure consistent performance and maintain RPO/RTO targets.

Riverbed optimizes data transfers over any backup product used to perform the data replication, providing unlimited ease and flexibility for enterprises. In fact, we've partnered with many of the most popular storage and backup software providers to ensure our products interoperate as effectively as possible. We have also completed formal certification and qualification processes to ensure compatibility with enterprise-class backup and data protection products from such vendors as:



Riverbed's unique combination of technologies can facilitate customer's current network-based backup and data replication strategy or ease their transition to a cloud-based data protection strategy.

About Riverbed

Riverbed is the IT performance company. WAN optimization solutions from Riverbed liberate 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.



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