PERFORMANCE BRIEF: Autodesk AutoCAD

TEST SUMMARY

- **Bandwidth utilization is reduced by up to 98%**
- **AutoCAD network operations are 7 times faster**

"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*

"When we tried using Steelhead appliances, the results were dramatic. Transfers for an edited file took about 2 minutes – the same amount of time that it takes us to access the file on a LAN."
– Erik Durand, *Director of IT, Psomas*

TESTING PARAMETERS

AutoCAD operations were tested using the AUGI (AutoCAD User Group International) Gauge Benchmark's "Net" test. This kit is an independently-created test tool that executes the most common operations that the typical AutoCAD user would perform over the WAN, including opens, saves, and file edits. For more information, visit www.augi.com.

The WAN environment consisted of a T1 connection, and either 100 or 20 milliseconds of delay between locations. This scenario would be typical of a WAN link between Los Angeles and New York, or in the case of low latency, New York and New Jersey offices.

This test was performed using Windows XP Professional as the client, Windows 2000 server, and AutoCAD 2005.

A "Cold Run" is defined as a data transfer that has never been seen by the Steelhead appliance before (a completely new file).

A "Warm Run" is defined as a data transfer in which the Steelhead appliance has seen most or all of the data before (a mirror recovery or an incremental update).

Riverbed Steelhead® Appliances Accelerate Autodesk AutoCAD®

Despite the efforts of AutoCAD to dramatically reduce the average file size of design documents, file collaboration over a Wide Area Network (WAN) can take a dramatic toll on productivity. Files are often many hundreds of megabytes, resulting in inefficiency even in basic operations such as file opens and file saves. Architecture, engineering, and manufacturing firms estimate that design engineers can spend one-quarter to one full hour a day on remote file operations, dramatically reducing the available working time per person.

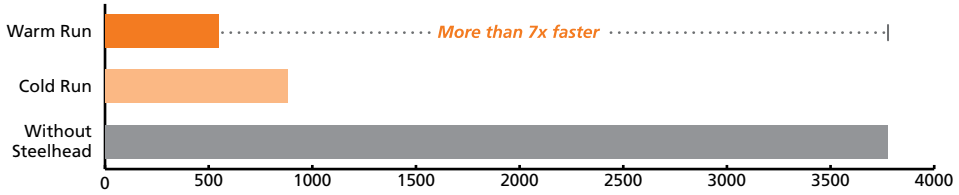
Steelhead-Enhanced AutoCAD

The network traffic associated with DWG files contains a large amount of compressible, repetitive data, even accounting for AutoCAD's recently reduced file sizes. The Steelhead appliance's scalable data referencing (SDR) algorithms remove all repetitive data from the WAN during common network operations, even as file names change, which dramatically reduces the time to complete file opens and saves. Additional optimizations like transaction prediction (TP) optimize for key application protocols, which further reduce transfer time. For more information on these features, see Steelhead Appliance Features section. Typical transfer times can be accelerated by 5x to over 100x, while bandwidth consumption can usually be reduced by 60% to 95%.

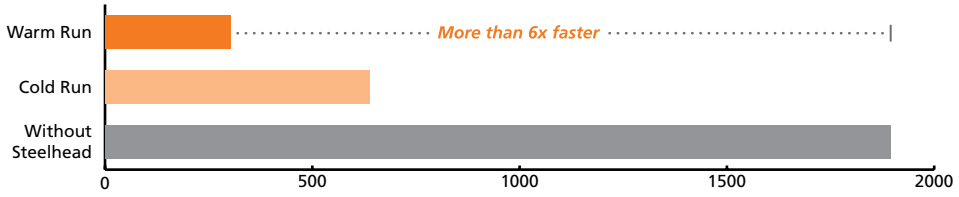
Performance Improvements

Riverbed Steelhead appliances accelerate AutoCAD tasks in the AUGI Gauge Benchmark Net test (see sidebar) by 7x. Steelhead appliances can accelerate tasks up to 100x in certain scenarios – see the reverse side for more detail. Simultaneously, bandwidth utilization was reduced by 98%, implying 98% of the data previously traversing the WAN was redundant information that was eliminated by Riverbed's scalable data referencing techniques.

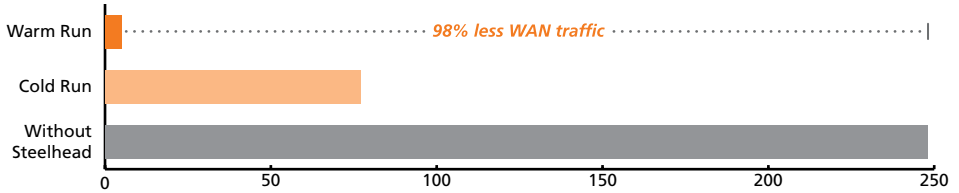
AUGI Gauge Benchmark Net Test Operations (100 ms delay) – Time to Complete (in seconds)



AUGI Gauge Benchmark Net Test Operations (20 ms delay) – Time to Complete (in seconds)



Bandwidth Utilization (in megabytes)



These results are based on the testing scenario presented in this paper. Your results may vary based on the conditions of your own network and the specifics of your own use cases.

PERFORMANCE BRIEF: Autodesk AutoCAD

DEPLOYMENT BENEFITS

Deploying Riverbed in conjunction with AutoCAD provides multiple benefits, including:

- **Productivity gains.** By dramatically reducing the amount of time needed to complete basic CAD file operations, engineers can save an hour per day or more.
- **Reduced bandwidth utilization.** Steelhead appliances reduce bandwidth utilization from remote offices that rely on accessing CAD documents located on networked file servers in other offices, reducing IT costs.
- **Better, faster collaboration.** By reducing the time to transfer AutoCAD files by an order or magnitude or more, Steelhead appliances enable users in multiple offices to work collaboratively on large design documents. Work can be shifted to offices with downtime, or the right person can work on a task regardless of their location.
- **Remote office server consolidation.** LAN-like WAN performance means that server consolidation becomes a reality, and remote IT infrastructure can be reduced or eliminated. IT maintenance costs can be reduced, and the tasks of upgrading and patching servers can be greatly simplified.

Steelhead Appliance 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.

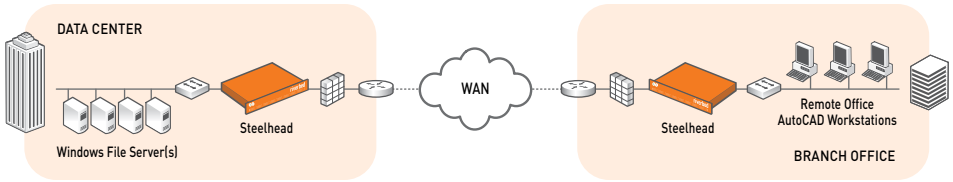
Application-Specific Optimizations – Steelhead appliances minimize the impact of WAN latencies on applications. By minimizing round trips and payloads generated at the application layer, Riverbed provides additional order-of-magnitude throughput increases to applications including Windows file sharing (CIFS), Exchange (MAPI), Web (HTTP), Database (MS-SQL), FTP, and backup and replication.

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.

Typical Deployment Architecture



Steelhead Appliances Accelerate a Broad Range of Applications