

TEST SUMMARY

- » Bandwidth utilization is reduced by up to 99%
- » AutoCAD 2010 network operations are 22 times faster

TESTING SCENARIO

AutoCAD operations were tested using the 2010 DWG format and 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 test environment to obtain the results described in this brief consisted of a WAN with a T1 connection, and 100 milliseconds of delay between locations. This scenario would be typical of a WAN link between Los Angeles and New York offices. This test was performed using Windows XP Professional as the client, Windows 2003 server, and AutoCAD 2010.

NOTE: The 2007 DWG format used by some recent versions of AutoCAD and Civil3D scrambles the file data during save operations even if no changes have been made to a drawing. As a result, all data de-duplication technologies are unable to recognize the newly reorganized bytes of data. Customers using Autodesk products that use the 2007 DWG format will see deteriorated performance from the test results presented in this brief. The tests results described were obtained through testing with the 2010 DWG format. AutoCAD 2010 has resolved these issues, giving the strong results shown.

Autodesk AutoCAD 2010

Riverbed® Steelhead® Appliances Accelerate Autodesk AutoCAD® 2010 and prior versions

AutoCAD provides state-of-the-art software used by leading architecture, engineering, and manufacturing firms across a wide range of industries. Firms use AutoCAD to design drawings and products and convey them visually to clients and collaborating parties. While the application provides an outstanding tool for organizations to

"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

standardize on for design purposes, the size of the drawing files often exceed hundreds of megabytes in size on larger projects and can impact employees' ability to collaborate effectively.

For firms with distributed offices or a global presence, sharing and collaborating on large CAD documents can often lead to significant delays in accessing

drawings during normal file open and save operations. Many 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. These delays impact productivity and overall time-to-market for customers, and ultimately, delivery to the client.

Steelhead-Enhanced AutoCAD 2010

Deploying Riverbed Steelhead products along with AutoCAD 2010 software can greatly reduce the amount of time required to open, save and transfer CAD documents across the wide area network (WAN). As a result, organizations can achieve LAN-like access speeds of centralized design documents and improve the collaboration and productivity of their design specialists. This gives firms the opportunity to source people on projects regardless of their location and enables real-time collaboration on designs across distributed teams.

The Riverbed Optimization System (RiO™) utilizes industry-leading data streamlining, transport streamlining, and application streamlining to provide data de-duplication, compression, transport layer and application protocol optimization. These optimizations can cut AutoCAD traffic on the WAN by as much as 99% and accelerate access times by up to 22x.

"When we tried using Steelhead® appliances, the results were dramatic. Transfers for an edited file took about two minutes – the same amount of time that it takes us to access the file on a LAN."

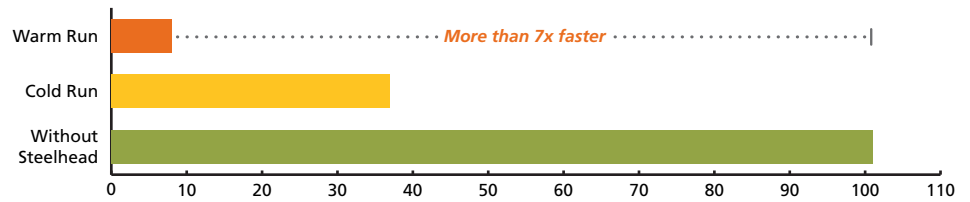
– Chris Pinckney, CIO, Psomas

DEPLOYMENT BENEFITS

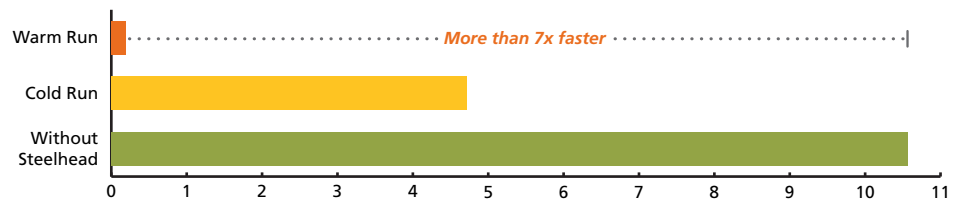
Deploying Riverbed in conjunction with AutoCAD 2010 provides multiple benefits, including:

- **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.

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)



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 Improvements

Riverbed Steelhead appliances accelerate AutoCAD 2010 tasks in the AUGI Gauge Benchmark Net test (see sidebar) by 22x. Steelhead appliances can accelerate tasks up to 100x in certain scenarios – see the reverse side for more detail. Simultaneously, bandwidth utilization was reduced by 99%, implying 99% of the data previously traversing the WAN was redundant information that was eliminated by Riverbed’s scalable data referencing techniques.

Riverbed Optimization System (RiOS™) Features

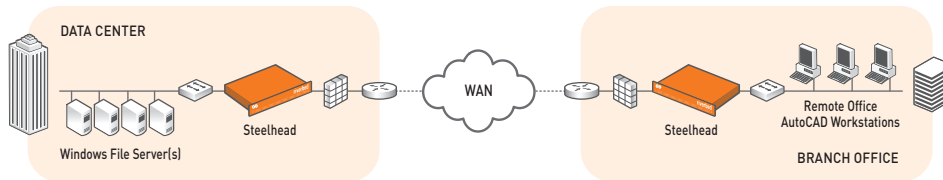
RiOS software combines patent-pending data reduction, TCP optimization, application-level latency optimizations, and remote office file and management functionality. Together, these technologies provide a comprehensive solution for enterprise wide-area data services, scaling across a range of applications and network topologies to accelerate applications from 5 to 50 times, and sometimes up to 100x. RiOS consists of four key components:

Data Streamlining – RiOS data streamlining works across all TCP applications to reduce bandwidth consumption by 60% to 95%. Data streamlining works across Windows file sharing, Microsoft Office, Email (including MS Exchange and Lotus Notes), SSL-encrypted applications, CAD, ERP, databases, and all other applications that use TCP, to ensure the same data is never sent more than once over the WAN. Data Streamlining also supports rules-based policy administration of optimization classes and packet marking for QoS and route control.

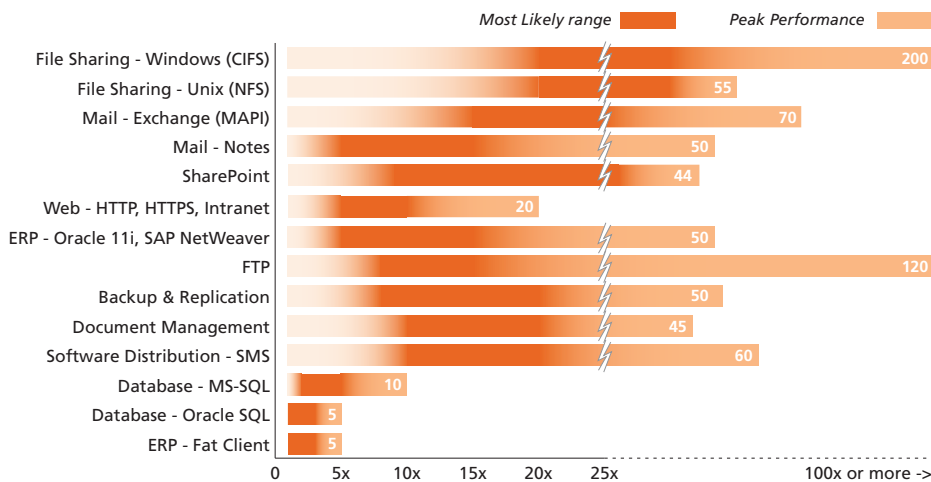
Transport Streamlining – RiOS transport streamlining reduces the number of TCP packets required to transfer data by 65% to 98%. Transport streamlining overcomes TCP limitations by adapting transmission characteristics such as window scale, loss handling, congestion notification, and more. Transport streamlining also allows SSL-encrypted applications to be accelerated as well. RiOS Transport streamlining also enables greater utilization of high bandwidth, high latency connections with High-Speed TCP and MX-TCP.

Application Streamlining – RiOS application streamlining provides additional order-of-magnitude application performance improvements by reducing application protocol chattiness up to 98% and minimizing application overhead. By minimizing application demands on the network such as application protocol round trips and required network connections, RiOS can provide massive throughput increases to applications including Windows file sharing (CIFS), Exchange (MAPI), Web (HTTP and HTTPS), and Database (MS-SQL). RiOS also includes important features for maximizing branch office productivity, such as file server capabilities and transparent pre-population of popular data.

Typical Deployment Architecture



Steelhead Products Accelerate a Broad Range of Applications





Think fast.™

About Riverbed

Riverbed Technology is the IT infrastructure performance company. The Riverbed family of wide area network (WAN) optimization solutions liberates 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. Thousands of companies with distributed operations use Riverbed to make their IT infrastructure faster, less expensive and more responsive. Additional information about Riverbed (NASDAQ: RVBD) is available at www.riverbed.com



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