InfoWorld
May 5, 2010
GET TECHNOLOGY RIGHT®

InfoWorld review: Riverbed Steelhead rules the WAN

Riverbed's RiOS 6 continues the tradition of WAN performance gains while improving flexibility, ease, and application support

AFTER SIX YEARS AND DOZENS OF product reviews, I still can't find anything really sexy about WAN acceleration and optimization. What is sexy — at least to upper management -- is making better use of the enterprise wide area network, especially in these economically trying times. Trying to convince the bean counters to spend money on infrastructure might seem like a lost cause, but when the facts are laid out and the return on investment is calculated with due diligence, WAN acceleration could be a no-brainer. If a high-performance WAN allows you to extend centralized resources, rather than duplicating them at the branch office, management will certainly like the math.

Riverbed recently updated its line of WAN optimization and acceleration appliances with the release of RiOS 6 and a couple of new hardware platforms. RiOS 6 builds on many of the advances made in RiOS 5, adds some new features, and enhances others. RiOS 6 continues Riverbed's forward-thinking approach to the WAN optimization space by building in more application- and protocol-specific optimizations, a compression and deduplication engine that adjusts on the fly, and even greater network transparency and traffic flow reporting. Throw in better overall performance than previous versions and the new release is a compelling solution for virtually any distributed enterprise.

My testing platform this time around consisted of a pair of Riverbed Steelhead 2050H 1U rack appliances rated at 6,000 optimized TCP connections and 45Mbps of optimized WAN throughput ($41,780 per appliance including Riverbed Services Platform). Aimed at the midsize office, the Steelhead 2050H includes 400GB of deduplication disk space, while another 75GB of disk is allocated to the Riverbed Services Platform (RSP) — Riverbed's VMware implementation built into RiOS 6.

As in previous reviews, I paired my Shunra Storm WAN simulator with trusty Windows Server 2003 and Windows XP clients to generate a variety of traffic through the system. My test was made up of a variety of WAN speeds and conditions, as well as a mix of various common traffic types. In addition to the two link speeds from previous tests -- 128Kbps with 40ms round-trip latency and a long-haul T1 with 500ms round-trip latency and 1 bit error in every 106 bits — I added a T3 link with 100ms of round-trip latency to give some perspective on fast cross-country links.

The test mixes included CIFS with many small files (1,004 files but only 10.4MB in total size); CIFS with one large file (a 155MB ISO image); Excel four-step (an open-copy-save as-open process); a MAPI test that saves a 700K attachment from Exchange to the local drive; and an FTP test using the same 155MB ISO file as the single-file CIFS test. All tests were executed using Macro Scheduler for consistency and timing. In every case, I saw small but measureable improvements in data reduction and overall performance compared to previous RiOS releases. Like previous versions of RiOS, RiOS 6 delivered huge increases in performance compared to native, non-optimized WAN links. It literally cut transfer times from hours to minutes, and minutes to seconds, depending on the nature of the data and the link.

Test Center Scorecard

	Performance	Protocol support	Reporting	Setup	Value	Overall Score
	40%	25%	15%	10%	10%	
Riverbed Steelhead with RiOS 6	9	9	9	9	10	9.1 EXCELLENT

Deduplication and compression

One of the most important enhancements is to Riverbed's SDR (Scalable Data Referencing) engine. RiOS 6 now has three modes of operation for deduplicating and compressing data as it passes through the appliance. The default mode is the same deduplication engine found in previous versions and leans toward maximum data reduction using disk-based deduplication. The two new modes of operation, SDR-Adaptive and SDR-M, come into play when disk I/O becomes a bottleneck.

Both SDR-Adaptive and SDR-M make use of memory-based compression; the difference is that one is dynamic, and the other is a fixed setting. SDR-Adaptive will dynamically switch between disk-based deduplication and memory-based compression whenever it detects that the disk I/O is becoming a limiting factor. One scenario where SDR-Adaptive would be used is data replication over the WAN. Longer transactions with larger data sets can potentially cause disk latency to slow the data transfer. SDR-Adaptive switches between deduplication and compression to balance data reduction and the load on the storage system.

SDR-M turns off disk-based deduplication entirely, relying exclusively on memory-only data compression to eliminate any potential disk I/O penalty. You would use SDR-M whenever overall speed is more important than data reduction or in cases where disk latency is a constant issue — such as when sending small chunks of data over a very fast WAN circuit.

While most networks will want to stay with the default setting, Riverbed is providing IT with a way to easily tailor the system to meet specific needs. I used the default SDR mode for all of my performance testing, and not once did I push the appliance's limits.

Citrix, Oracle, and Mac CIFS

There are a couple of new application- and protocol-specific improvements in RiOS 6. Mac users will now enjoy better overall performance with the addition of optimizations for Mac SMB/CIFS file sharing. Even though Windows and Mac both support the CIFS (Common Internet File System) protocol, the Mac implementation of CIFS was just different enough that previous optimizations in RiOS were less than stellar for Mac users. Now for Mac OS X 10.5, RiOS 6 speaks Mac and Windows CIFS.

RiOS 6 also comes with specific optimizations for Citrix ICA (Independent Computing Architecture). It can automatically decrypt and optimize Citrix traffic, as well as prioritize and classify different types of traffic using the built-in QoS engine. For example, IT can define interactive traffic with a higher priority than print jobs. Riverbed reports anywhere between a 30 and 50 percent improvement in response times, but I haven't yet tested this feature in my lab (stay tuned).

There are also application-specific improvements around Oracle 12i. RiOS can optimize Oracle E-Business Suite 12i, as well as Oracle Forms over HTTP, HTTPS, and native mode. And HTTP itself gets a boost with an enhanced object prefetch engine to help speed up access to Web applications such as SharePoint and SAP.

One of the features that made a splash a couple of years ago was RiOS's ability to optimize SSL traffic. In RiOS 6, setting up HTTPS optimization is a snap. Simply import your SSL certificates into each server-side Steelhead appliance, and any connected remote appliance will automatically create the in-path optimization rule. This even holds true for wild card (for example, *.domain.com) certificates. Also, for customers that employ SSL over higher-latency links, RiOS 6 can reuse a previous SSL session key. This will help reduce SSL setup time, as well as unnecessary round-trips and processing time on the server, providing a nice boost in client response time.

Riverbed Services Platform

Riverbed Services Platform (RSP) is the built-in VMware virtualization platform for hosting prebuilt or custom packages. The appliance has five slots, each with its own RAM settings, heartbeat intervals, and optimization policies. New to RiOS 6 is support for adding disk space to a virtual machine, routing around or failing open when a VM fails a heartbeat check, and deploying a VM with multiple virtual network interfaces. Plus, optimization policy can be applied independently to each virtual machine. Flexibility is key with RSPaut RiOS 5 included new transparency modes to allow WAN monitoring tools and firewalls to examine the traffic passing through them. The new Full Transparency with Reset in RiOS 6 corrects an issue some stateful packet inspection firewalls had with the Full Transparency mode in RiOS 5. Previously, some stateful firewalls would interpret Riverbed's connection setup sequences as an attack and drop the connection. Now, an RST (reset connection flag) packet is sent before the connection setup to clear the state on the firewall and enable the connection to proceed. While not guaranteed to work with all stateful firewalls, this should go a long way to smoothing any existing issues.

Other improvements to RiOS 6 include support for SNMP v3 and XML SOAP via a new API. The logging service is improved with more detail captured in each log entry, better filtering options, and support for NetFlow v9 and Cascade v9.

Each time I get my hands on a new Steelhead appliance, I come away impressed by how Riverbed can still find ways to improve it. The new features in RiOS 6 add even more capacity, flexibility, and scalability to an already superb product, and the new chassis fits in well with midsize office needs, yet doesn't scrimp on any particular feature. All in all, Riverbed continues to define what a WAN optimization and acceleration appliance should be. No IT shop evaluating a WAN acceleration and optimization solution should pass up a chance to put a Steelhead appliance through its paces.

— Keith Schultz

riverbed®
Think fast.™
Riverbed Technology
199 Fremont St.
San Francisco, CA 94105
Tel: 415 247 8800
Fax: 415 247 8801