

Riverbed RiOS 4.0: Raising the Bar in Wide Area Data Services

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On March 14th, Riverbed released RiOS 4.0, a major enhancement to its flagship operating system behind the Riverbed Steelhead WDS (wide-area data services) appliance. With RiOS 4.0, Riverbed has addressed several crucial areas in terms of accelerating encrypted, secure traffic and improving the performance of chatty web-based applications that previously had been unaddressed by WDS products. RiOS will help to satisfy Riverbed's enterprise customers who need to balance both speed and security and will help to keep Riverbed out in front of its WDS competition. Riverbed has not rested on its laurels and continues to push the boundaries of the WDS product category.

SSL-encrypted data and object-heavy HTTP applications suffer unacceptable lag times over the WAN and force expensive bandwidth upgrades. The question then becomes: how do businesses balance the demands of data security and web-based processing with the need to accelerate vast amounts of data flowing over the WAN?

RiOS is positioned at the nexus of these two trends – heightened need for secure encrypted communications and increased deployment and use of web-based applications. First, enterprises are increasingly turning to SSL as the workhorse protocol for ensuring secure, encrypted communication between ROBOs (Remote Office/Branch Office) and the main data centers. Prior to the advent of RiOS 4.0, enterprises were forced to trade off security for performance if they wanted to deploy a WDS solution. No WDS solution on the market offered accelerated SSL communication that could keep all sensitive SSL certificates and private keys within the data center. RiOS 4.0 becomes the first WDS product to offer true symmetric accelerated SSL without breaking the trust relationships.

Second, web-based applications are increasingly replacing older client server applications as packaged application vendors “webify” their applications. Furthermore, web-based applications have become the defacto application architecture for most new internally developed or custom applications. As a result, a growing amount of traffic makes use of the HTTP and HTTPS protocols. RiOS 4.0 adds new capabilities to accelerate and improve performance of HTTP and HTTPS protocols.

The Importance of WDS

WDS combines acceleration, optimization, and WAFS (Wide Area File Services) to speed WAN traffic to near-LAN speeds. This technology is of utmost importance to the enterprise as it re-architects ROBO infrastructure. To that end, Taneja Group predicts in a recent report entitled “Next Generation Data Protection Market Forecast 2006-2010” that the high growth, strategic WDS category will top \$1.418B by 2010.

WDS works by 1) integrating WAN optimization, application acceleration, and WAFS to consolidate branch office servers, storage, and backup infrastructure into the data centers; and 2) delivering close to LAN speeds to users in the branch offices across the WAN. Common WDS tasks include centralizing distributed infrastructure, sharing large files among distributed offices without delays or lags, performing efficient backup and replication over long distances, and delivering robust WAN services without expensive bandwidth upgrades.

The Steelhead appliances form a system of distributed network devices in remote offices that communicate with a Steelhead appliance server at the main data center. Riverbed concentrates on accelerating application performance over the WAN using TCP acceleration, application protocol acceleration, and dynamic compression on an application’s first pass, followed by dictionary compression and transparent turn reduction.

Key Product Features in RiOS 4.0

- **SSL Acceleration.** Riverbed is the first WDS vendor to accelerate SSL without reducing data security. Prior to RiOS 4.0, Riverbed supported SSL as a pass-through model but offered no performance gains. Its new ability to accelerate SSL is a welcome move for its performance and security-conscious clientele. RiOS 4.0 copies SSL certificates and private keys to the server-side Steelhead, not to the client side. (Steelhead appliances use their own identity certificates to establish a secure connection among client and server-side appliances.) The advantage of keeping certificates on the server-side is that the enterprise can certify SSL security protocols at the consolidated data center level without involving branch offices, and certificates cannot be faked at the client-side Steelhead. Another advantage is not having to place certificates on every client, which can easily turn into an administrative and security hell.

On data request, the client begins the SSL session with the server-side Steelhead and the temporary session key is delivered to the client. If desired, the SSL session between the server-side Steelhead and the origin server may use an optional null encryption key – not a security risk because both devices are located in the data center. This process ensures that the data flowing between the Steelheads is using secure SSL minus the added layer of encryption/decryption between the client and server appliances. Steelhead accelerates SSL session transfers via data, transport, and application streamlining mechanisms.

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Riverbed also allows for IT's reluctance to change working trust models. It offers a patented technology called split termination to preserve existing trust models within the Riverbed Steelheads. Split termination allows customers to maintain the preferred trust model while still providing end-to-end secure traffic acceleration.

- **HTTP/HTTPS Streamlining.** SSL encryption is not the only culprit in slowing down WAN transmissions. Riverbed also has enhanced its HTTP Application Streamlining Module with Layer-7 acceleration for chatty web applications like SAP, Siebel, PeopleSoft, IBM Websphere, and MS Sharepoint. This functionality is also available for HTTPS now as well. RiOS 4.0 offers HTTP/HTTPS application streamlining by first seeing the request by the client-side Steelhead. The Steelhead learns all objects that are to be downloaded within the page/URL including objects embedded within cascading style sheets (CSS) or scripts. The appliance records objects and actions in a knowledge base and then forwards requests of all page objects in parallel. Parallel processing and RiOS streamlining optimizes the WAN transfer. The process is faster than a parse and prefetch mode because the appliance can reference its knowledge base of objects and actions, and has no need to recheck every web page request. Steelhead appliances can also request all the objects at once rather than opening multiple TCP connections for object requests, providing a much faster response time.
- **TCP acceleration.** TCP transfers can ramp up slowly and ramp back down at the first sign of packet loss. Riverbed RiOS optimizes WAN bandwidth with HS-TCP and MX-TCP protocols based on TCP. HS-TCP is designed for shared bandwidth connections with no packet loss, enabling high utilization of large links with single TCP connections. For scenarios experiencing packet loss, MX-TCP allows the administrator to configure a throughput limit and allows the Steelhead to use 100% of the limit. The Steelhead prioritizes lost packets to be sent again.
- **Simplified configuration.** Riverbed has also added simplified configuration, a welcome step in remote offices that might not have dedicated IT staff. Upgrades include enhanced auto-discovery for easier deployments in complex environments, additional failover capabilities, central management console enhancements, and a local print option.

Taneja Group Opinion

The market for WDS is exploding and Riverbed is a primary beneficiary of this growth. Riverbed jumped out to a strong leadership position by offering a single platform that efficiently combined application acceleration, WAN optimization and wide area file sharing. In contrast, many of Riverbed's competitors initially attacked the problem from either the WAFS angle or from the WAN optimization angle. In an attempt to broaden their offerings they have

O P I N I O N

acquired point solutions, but are now struggling to merge and rationalize the technologies into unified architectures. One of Riverbed's core enduring differentiators in the market remains the fact that with RiOS it has a single, unified platform that can efficiently accelerate application, WAN, and WAFS traffic.

Riverbed's claim to fame has always been its broad protocol support within the Steelhead appliances, which are well suited for large enterprise WANs. With the addition of SSL and HTTP/HTTPS acceleration, as well as simplified deployment and management capabilities, Riverbed is successfully defending its leadership position from oncoming competitors.

The enterprise must continually weigh its needs for data security and speed against the ongoing cost of expensive additional bandwidth. WDS is a fundamental technology for optimizing the enterprise WAN without incurring huge capital costs, and Riverbed is deservedly in the thick of it. Taneja Group applauds Riverbed for developing and expanding its core acceleration technology to serve today's demanding business applications. Riverbed continues to push the technology envelope of the WDS category and deliver innovative new optimization technologies for the evolving requirements of ROBO. As a result, Taneja Group believes that Riverbed has yet again raised the bar for the entire category and will continue to defend its leadership position vigorously in the increasingly crowded WDS space.

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