

Riverbed QoS – Predictability and Control designed for Dynamic Applications

Quality of Service (QoS) is certainly not a new concept for enterprises looking to make better use of their scarce network resources. However, the ability to deliver controlled, effective, and manageable QoS continues to elude most organizations.

Leveraging the footprint of its WAN optimization appliances in the branch office and data center, Riverbed provides next-generation QoS functionality on Steelhead® appliances. This eliminates the need for a separate QoS device or changes to the network router. However, Riverbed has gone beyond merely consolidating QoS functionality with WAN optimization to designing a better system for QoS. In particular, Riverbed solves limitations found with existing QoS approaches for organizations that:

- Have a dynamic application mix that increasingly includes real-time and interactive applications, rich media and Web in addition to files and email
- Are dealing with an increase in recreational traffic
- Have a highly distributed computing environments that are difficult to manage on a site-by-site basis

AppFlow Engine

QoS systems often rely solely on deep packet inspection (DPI) schemes to determine the type of application being transmitted. There are a number of challenges with a DPI-only approach:

- DPI can be incredibly resource intensive, as it requires packet-by-packet inspection of payload contents.
- DPI has limited intelligence because it focuses on a single connection at a time.
- DPI will often fail with more insidious applications that try to hide who they are by port hopping or obfuscating their payloads.

Riverbed has created a system of application flow intelligence to solve the limitations of DPI. While packet payload inspection is still used as part of the system, the Steelhead products use a combination of techniques that are simultaneously more efficient and more discerning:

- Protocol decoding follows the conversation to identify and extract deeper information about the true nature and attributes of an application.
- Future flow registration recognizes that applications can use multiple flows for a transaction and more efficiently and accurately identifies follow-on flows.
- Cross packet pattern matching ensures that a packet payload is actually what it claims to be despite the presence of fragmentation or out-of-order packets

These *behavioral* heuristics enable a Steelhead appliance to quickly identify behaviors that are unique to certain applications and to validate whether they are what they claim to be.

BENEFITS

- AppFlow intelligence delivers unequalled application traffic classification
- Hierarchical Fair Service Curve (HSFC) eliminates the need to overprovision bandwidth for latency sensitive applications
- Inbound QoS enables the control of traffic entering a site to make room for key business applications
- Scalable template-based configuration simplifies deployment and enforcement of QoS policies

Hierarchical Fair Service Curve (HFSC)

Most QoS systems typically use some form of class-based weighted fair queuing scheme. These systems treat all applications the same regardless of the sensitivity to latency – and the only way to ensure that latency-sensitive applications are properly prioritized is to either over-provision bandwidth or dump all real-time applications into a single, fast-tracked bucket. The end result is inefficient use of bandwidth – a poor outcome for an already scarce resource – and having applications like voice and video continue to compete with each other.

Riverbed QoS is different. Using HFSC, QoS on a Steelhead appliance solves this challenge in a new way. HFSC leverages the work of scientists at Carnegie Mellon University to create a system that recognizes that certain applications like application streaming, voice, and video need special scheduling – not more bandwidth – to be effectively delivered.

Inbound QoS

Inbound QoS allows traffic control policies to be configured for traffic entering a site. This is important whenever multiple remote offices access data from a common shared central site because it allows QoS policies to account for the bandwidth availability at each remote location. Without inbound QoS, enforcement may be indiscriminately applied from the central site to all traffic being delivered to all remote sites, regardless of the actual amount of bandwidth at each individual site.

The Inbound QoS featured on Steelhead appliances operates asymmetrically, identifying and controlling all applications by individual location, making room for key business applications to get the bandwidth they need by slowing down less important traffic. This becomes critical for organizations that have business and recreational traffic sharing the same links.

Scalable Template-based Management

Most QoS systems require building policies from the bottom up, or worse, use an error-prone scripting process. Building a QoS policy by configuring bandwidth per user or per application results in confusion over how the various applications really interact on the network. Any changes that the administrator needs to make typically involve re-adjusting multiple rules.

Riverbed dramatically simplifies the process of provisioning QoS into a simple 3-step process. This process allows for:

- Easy point-and-click provisioning that takes into account the bandwidth *and* latency sensitivity needs of applications
- The use of 'profiles' for remote locations that can easily be associated with new offices
- The ability to propagate a change throughout the entire system with a few clicks

This method of templated, point-and-click QoS provisioning is a dramatic improvement that will make QoS dramatically easier to implement and manage across an organization. It makes clear what performance to expect for each application, simplifies the process of responding to change, and allows for greater responsiveness to business demands.

Summary

Riverbed offers advanced QoS within the same device that also provides WAN optimization delivering a powerful combination of capabilities that help users accelerate and control their network traffic. Riverbed QoS integrates intelligence that accurately recognizes applications and provides protection and predictability for latency sensitive applications. Beyond simply providing better QoS capabilities, the Riverbed solution also provides simplified management that allows IT organizations to quickly configure QoS – and reconfigure a needed – across many sites, even with complex and changing requirements.

About Riverbed

Riverbed delivers performance for the globally connected enterprise. With Riverbed, enterprises can successfully and intelligently implement strategic initiatives such as virtualization, consolidation, cloud computing, and disaster recovery without fear of compromising performance. By giving enterprises the platform they need to understand, optimize and consolidate their IT, Riverbed helps enterprises to build a fast, fluid and dynamic IT architecture that aligns with the business needs of the organization. Additional information about Riverbed (NASDAQ: RVBD) is available at www.riverbed.com.



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