



TenStep Supplemental Paper

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Network Application Priority Switches

The three most common approaches to Service Level Management (SLM) are:

'All-in-one' Router-Based Solutions: Weighted Fair Queuing

Many router manufacturers have already started upgrading their products with new SLM and traffic software. Most of these all-in-one routers use Weighted Fair Queuing (WFQ) for service level management and re-allocation of bandwidth for applications. However, unlike other solutions, WFQ doesn't provide detailed analysis and bandwidth allocation. It classifies data packets into interactive and non-interactive traffic. The interactive traffic is given higher priority to reduce time, while the non-interactive traffic is allowed to share the remaining bandwidth proportionately. However, WFQ doesn't support detailed data analysis at layer 7 and fails to adapt to the changing network conditions.

The performance of the all-in-one router suffers as it lacks the required processing power to support the WFQ and traffic shaping capabilities along with the SLM software. This in turn affects the execution of applications and network management capabilities. The interoperability of all-in-one routers with those from other manufacturers is limited by their proprietary design.

LAN-Based Accelerator Solutions

These are dedicated hardware devices with software that provide traffic shaping and prioritization. They manage the network from the LAN side of the router to optimize bandwidth usage. However, most application bottlenecks occur on the WAN. LAN accelerators use general throttle and selective throttle features to identify and scale back traffic from particular servers. This capability could be used to avoid an infected Internet link. Although this technique can stop a DOS (Denial of Service) bottleneck, it causes service interruptions to mission-critical applications. LAN accelerators also allow enterprise customers to differentiate between traffic linked with applications, protocols, subnets, Web pages and users.

However, LAN accelerators facilitate limited analysis of the network. They can only identify congestion at the IP and application levels. Their inability to detect WAN bottlenecks results in inaccurate measurement of service delays. The reports do not reflect network usage and long-term performance. LAN accelerators cannot differentiate the network either by LAN or WAN. They are also unable to verify SLAs at link-level against application-level SLAs. Moreover, there is no centralized database for a LAN accelerator. This requires each device on the network to be queried separately.

New Infrastructure: The Application Priority Switch

Network Application Priority Switch (NAPS) is a dedicated, hardware-based SLM solution located between the router and the wide area link. It allows IT managers, ASPs and others to guarantee application delivery and define application CIRs and SLAs. The software in this new device assigns traffic to different queues. The least important



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applications are assigned to slower queues. The new device is able to identify the application type at layer 7 and allocate the bandwidth accordingly. It is also capable of differentiating sub-applications. Using this capability, application CIRs help carriers, network managers and ASPs to produce SLAs reporting on actual network conditions.

NAPS employs Adaptive Weighted Fair Queuing (AWFQ), which, unlike WFQ, provides real-time monitoring of traffic and re-allocation of bandwidth on the fly. Real-time monitoring of application-level traffic helps allocate bandwidth to mission-critical applications. NAPS provides a more granular perspective of network traffic. This helps generate statistics for each individual circuit. It also facilitates analysis of response times and network line error detection.

The more granular and real-time approach of NAPS helps carriers and service providers, as well as enterprise customers, to proactively prioritize traffic both by application and end-user customer.