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## **Building a Smarter System: Applying Network Business Intelligence for Proactive QoS**

**By: Rami Hadar, CEO, Allot Communications**

In a world where consumers have a nearly unprecedented choice of service providers, it is more important than ever for providers to keep customers happy and loyal. But, many companies wait until they hear about problems with service levels from customers before implementing change. In many cases, this reactive approach to managing quality of service (QoS) is simply “too little, too late” – once customers have a negative service experience, they are already looking at new providers.

A proactive approach to manage QoS is much more effective, but how can you predict problems before they happen? Network slowdowns, dropped connections, outages, security breaches, usage swings and other issues tend to happen with very little (if any) warning. And IT staff already spend most of their time putting out fires instead of looking for smoke.

But there’s hope! There are new technologies that monitor and control network activity, helping IT administrators optimize the network for long-term service improvements and make changes in real time to mitigate short-term problems before they impact service levels.

This approach not only improves the performance of the physical network, but can give service providers the flexibility and customer insight they need to introduce new services or tiered packages and create new revenue opportunities. All of these capabilities combined can lead to a higher QoS and happier, more loyal customers.

### *DPI for service optimization*

A new category of network management technologies is beginning to focus on *DPI for service optimization*. From a technical standpoint, this approach provides IT administrators with a clear understanding of the nature of all traffic flows crossing the network, through inspecting the packets on the network.

From a business perspective, however, DPI for service optimization is the key to adding a layer of business “intelligence” to the network (some even call it Layer 8). By having visibility into the network, and creating business rules for minimum standards of service, companies can define optimal levels of service on the network and enforce them, regardless of most external forces, such as usage swings.

This approach is vastly different from how most service providers manage their networks today. As noted, many service providers react to problems instead of

managing the network in a way that helps to avoid them. In fact, the most common reaction to most service provider network issues is to purchase more bandwidth. Unfortunately, most providers that choose this route find that their new, costly additional bandwidth is consumed almost immediately, landing the provider back in the same situation they were in before.

So, why isn't more bandwidth enough?

With the growing popularity of triple play voice/data/video services and file sharing, the need for effective QoS has become much broader. In other words, networks are no longer about speeds, feeds and capacity; they are about providing crucial visibility of network usage and user behavior. Adding intelligence to the network transforms a dumb infrastructure into a network capable of differentiating traffic by nature, instantly provisioning resources where and when needed and self adapting its behaviour to external conditions, especially in case of threatening and dangerous attacks occurrences.

A good way to visualize business network intelligence is to think about an airport. Traffic controllers can't just add another runway or speed up the arrival and departure of planes – runways would clog and safety would be compromised. But, by knowing exactly which aircraft are travelling to and from destinations, controllers can optimize the traffic flow to maintain efficient and safe travel for everyone. They can allocate planes of different sizes to different runways and prioritize flights based in the type of departure (domestic or international). This approach ensures that all airline customers get to their intended destination. If one runway closes, controllers can switch traffic to another runway and re-prioritize traffic to maintain the flow.



### *The Trouble with IP*

Peer-to-peer (P2P) file-sharing, Internet telephony, pay-per-view, on-line gaming and other high bandwidth applications are taking over the Internet. The proliferation and adoption of these applications is astounding and offers an opportunity for service providers to broaden their service offerings and create new streams of revenue. But, as more applications and users traverse the networks, service levels decline.

As it stands, IP is a fairly primitive vehicle. In and of itself, IP is not application-aware, nor is it subscriber-aware. It can deliver simple usage statistics, but it does not have any built-in priority mechanisms and it cannot solve contention issues. In our airport analogy, IP is the runway.

When a finite resource, shared among a growing population with more robust traffic, has minimum QoS standards, the solution is always "segmentation" and "optimization" of the resource to better meet demand. But, IP alone cannot offer any segmentation or optimization capabilities. So, providers either do without and hope for the best, or they deploy DPI for service optimization.

#### *Using technology to enforce business service levels*

Capable of accurately identifying hundreds of applications, DPI for service optimization can detect changes in levels of users, monitor network status, evaluate trends and track network behavior down to a single connection. This is equivalent to the traffic control systems at airports. While most IT administrators don't have an airspace map with blinking dots on it, the concept is parallel.

With automated policy-enforcement capabilities inherent within DPI, businesses can set minimum levels of service quality for the business and then create network performance policies to ensure that business policies are met.



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For example, it is not uncommon for P2P traffic to consume up to 70 percent of total capacity for some providers. With DPI for service optimization, the provider can create a simple traffic policy (with a few mouse clicks) that immediately limits P2P traffic to 20 percent, thereby instantly freeing up 50 percent of total Internet bandwidth. Different policies can be set for downstream (to the subscriber) vs. upstream (away from the subscriber) traffic flows.

Usage statistics are collected on a continuous basis, offering real-time visibility into all aspects of the network. This helps IT administrators understand the past and the present, as well as make intelligent forecasts on future behaviors to pre-empt potential network issues. The network also can report on abnormal phenomena as it happens, allowing administrators to make real-time changes to maintain service levels even in crisis mode.

Once visibility into usages, habits and behaviour is in place, IT administrators can use this wealth of detailed utilization data to intelligently evaluate and segment individual users into homogenous groups such as gamers, VoIP users, high-

bandwidth users, casual users or others. Categorizing users into groups and understanding their usage patterns by time of day, application, protocol, byte count, etc. helps providers create highly targeted service packages and billing options for different groups.

New service examples might include:

- VoIP services for those already using Skype or Vonage
- Gaming services, with increased throughput and highest priority treatment during weekend or evening hours
- Low cost, low throughput plans for casual users
- Plans for high bandwidth users or heavy P2P users
- Various “class of service” plans for business users, such as plans that prioritize VPN traffic, or offer higher overall priority than other business users

More providers are moving toward innovative billing models to help level the playing field among heavy and casual users, now that these segmentations are possible. Usage-based billing offers the truest form of equality, where subscribers pay by the megabyte. IT administrators with long-term reporting and accounting software can track each and every subscriber session, so data is easily obtained and integrated with billing systems.

For “power users” or businesses that require periods of additional bandwidth, providers can even create bandwidth on-demand or customer self-provisioning. Providers can create a secure portal for subscribers to dynamically request additional bandwidth for specific periods of time. For instance, providers might offer subscribers a “turbo button” that allows them to increase their bandwidth from 1 Mbps to 5 Mbps for a short period of time while they download a movie. Or, a business subscriber could access a “virtual policy manager” to set and change application-priority policies and see trending and real-time reports.

DPI for service optimization provides an inherent “fairness” mechanism that levels the playing field and ensures the highest quality of service for everyone. Ultimately, the benefits offered by DPI for service optimization are not limited to technology improvements. By harnessing the data within the network, providers can manage QoS on the physical layer, as well as create value on the business level. By proactively creating visibility into the network, the potential for negative service experiences can be limited, leading to a happier, more loyal customer base.