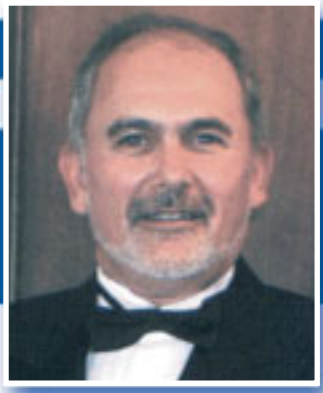

- John Breakey, Network Industry Columnist -

Solving the Bandwidth Problem

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Solving the Bandwidth Problem

There is a relationship between the content being transported on a network and the bandwidth available to do so. The nature of a data network is to provide average service to occasionally demanding loads. Applications evolve and grow in number while network links are slow to adapt. Eventually, bandwidth starvation and the contention between applications leads to performance problems and complaints. When the problem is discovered, the easiest solution is to add more bandwidth to the affected area. This solution buys a little time until the problem recurs, and is not an efficient investment overall.

To understand why you have a bandwidth problem, ask yourself the following questions:

- What are my business critical applications?
- What other applications exist?
- What are the characteristics and network behaviour of each?

It is often difficult to provide complete answers to these questions. Network traffic within the enterprise can be loosely categorized into three groups: Business Critical, Non-critical and sanctioned, and Non-sanctioned. Business critical applications include your ERP package and E-mail. Non-critical applications include Web Surfing in most enterprises. Non-sanctioned applications are those you do not condone, and have no business being transported across your equipment. Your users make up the majority of the active hosts on the network, and most users will partake in non-sanctioned or non-critical activities given the choice. This cohort will consume the majority of bandwidth that is available to service business-critical traffic.

Stepping down a layer into the technical realm, bandwidth starvation compounds performance problems. Being out of bandwidth is one thing, but when congestion occurs, the switches and routers that move our bits from end to end will simply drop traffic, causing our end hosts to retransmit and waste even more bandwidth. It is not uncommon for 15 to 25 percent of a starved Internet connection's bandwidth to be wasted on retransmissions. Another area that should be scrutinized is the non-sanctioned set of applications. These will typically include the latest peer-to-peer file sharing tools, such as Kazaa and Gnutella. Not only do these tools waste bandwidth, but also upon closer analysis, you may come to realize that these tools are bypassing your costly investment in network security - sharing your confidential information with others on the Internet, often by accident. These tools also make it easy for users to download questionable or illegal content onto your PCs or Server disks.

Now that you understand the issue, you might be wondering how to deal with the problem. The solution is simpler than you think. There are several appliance and software-based solutions that will provide the Who, What, Where and When of each traffic type. With this information in hand, you can easily filter the non-sanctioned traffic. Some of these solutions also allow you to control the usage of the flows you want to keep. Acting as a police officer in the middle of a traffic flow, some products can slow the session down, preventing retransmissions that waste bandwidth and in turn increasing the service level overall. A typical expectation is that you will reclaim 50% of your wasted bandwidth by controlling the traffic flow.

Even if you have eliminated some traffic, and increased efficiency, you may still find that performance is not where it should be. Most all products in this category will allow you to prioritize traffic, with some even going as far as guaranteeing bandwidth to your delay-sensitive applications. A typical configuration is to allow non-critical traffic to use available bandwidth, only after business-critical applications are performing adequately.

Whenever I discuss these types of solutions with my customers, I always relish in the next question: "That sounds terrific, but how am I going to get the budget to pay for it?" You'll recall at the start of the article that I said you might have been inclined to add bandwidth. That addition is an operational expense that can be deferred or eliminated by implementing a control device. The number of months you can delay adding bandwidth, multiplied by the cost of that bandwidth each month, tends to equal a greater number than the cost of the solution. In other words, you get to stay on top of your bandwidth usage as capacity increases and it costs you next to nothing. In fact, you will save money in the long run.