

WAN Acceleration

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The Remote Office Connectivity Problems: Bandwidth and Latency

IT departments have historically struggled with remote office connectivity. This connectivity may be necessary for a number of reasons: security, application access and backup, or messaging, to name a few. The two biggest problems for wide area communication are bandwidth and latency. Bandwidth is how big the connection is and latency is the transit time. Bandwidth can always be increased by spending more money, but latency is subject to the laws of physics and cannot.

Local network communication within an environment has always benefited from ample bandwidth, but many companies have less than 1/100 of the bandwidth between remote sites and sometimes as much as 1/1000 than they do locally. The primary reason for this is cost. While it is relatively inexpensive to increase the number of connections or speed on a local network, it can cost thousands of dollars more on a monthly basis for a fraction of the bandwidth. International links can cost as much as \$10,000 per month for a connection that is about 1/100 slower than the average network.

Wide area networks also suffer from latencies that are as much as 1000 times that of local connections. Latency is how long something takes in network communications. A packet of network traffic averages about 100 milliseconds between Silicon Valley and New York. This compared to the few milliseconds it takes for traffic on a local network is monumental.

The net result of all of this is that many companies reduce the cost of communications by increasing systems cost and creating a distributed environment. It is very common for a company to have multiple sites and maintain the exact same systems at each site because it is cheaper than the cost of increasing the size of the network links between the sites.





The Solution: WAN Accelerators

A new generation of communication hardware, generally known as WAN Accelerators, has been developed to address these needs. These devices are installed one at each end of a communication link and manage all traffic that passes across that link. The Wan accelerators achieve better performance through a number of methods. One of the simplest methods is compression. WAN accelerators remove the excess information in the communication stream that is unnecessary, reducing the size of the packets transmitted and received.

A second method is direct caching. With this method a WAN Accelerator will make copies of the traffic that passes across the WAN circuit. Instead of sending information that has already passed through before, the transmitting WAN Accelerator will let the receiving WAN Accelerator know what the data is and the receiving WAN Accelerator will pull the information from its cache. This works much in the same way that an Internet Proxy server performs.

A more improved method than direct caching is pattern matching. Some vendors have developed methods to categorize the information that goes through a WAN accelerator. Instead of passing that information raw, it substitutes a key for that particular pattern that the WAN accelerator at the other end recognizes and puts the correct data pattern back in on the other end of the link. This is performed in small chunks.

Some WAN accelerators further improve performance by inserting pieces of data into the communication stream for the client on the far side of the link further improving speeds. This means that a WAN accelerator may be able to insert 1MB of data into a 20 byte stream, significantly improving performance.

What does all of this mean?

In short it means that companies will no longer need to replicate systems and data at remote sites and can maintain a centralized environment. By using a centralized environment companies can simplify the administration and support of systems as well as reduce the costs of equipment, infrastructure and operations. This adoption will also improve security and backup performance.

This technology will allow companies to enable new services that could never be considered in the past. With WAN Accelerators in place, the centralized backup and recovery becomes a real possibility. Another area is web based client/server applications. Many companies have adopted these applications only to find that WAN performance is unacceptable and dramatically reduces the effectiveness of the application.

The Bottom Line: ROI

WAN acceleration adoption will itself accelerate as companies realize the benefits of these devices. The ROI that a company can experience can be significant. A good example is a company that has a central office and 10 branch offices. Each branch averages 10 employees and is connected by a 512K circuit. The typical systems deployed at each site are a File server, Exchange server and a tape autoloader. The IT department is considering moving up to a 1.5Mbps circuit. The annual cost for the 10 branches looks like the following;

Category	Annual Cost
File Server Acquisition	\$ 15,000.00
File Server Operation	\$ 30,000.00
Exchange Server Acquisition	\$ 13,330.00
Exchange Server Operation	\$ 30,000.00
Tape Autoloader Acquisition	\$ 10,000.00
Tape Autoloader Operation	\$ 30,000.00
Backup Media (10 tapes/wk)	\$ 2,860.00
Backup Software	\$ 1,000.00
Wan Costs	\$ 6,000.00
WAN upgrade Cost	\$ 12,000.00
Total Annual	\$ 150,190.00

By implementing WAN acceleration for the 10 branches the following savings are realized;

Category	Reduction	Annual Cost
File Server Acquisition, due to central consolidation	60%	\$ 600.00
File Server Operation, due to central consolidation	75%	\$ 750.00
Exchange Server Acquisition, due to central consolidation	60%	\$ 533.00
Exchange Server Operation, due to central consolidation	75%	\$ 750.00
Tape Autoloader Acquisition, due to central consolidation	60%	\$ 400.00
Tape Autoloader Operation, due to central consolidation	75%	\$ 750.00
Backup Media (7 tapes/wk), due to central consolidation	30%	\$ 17,160.00
Backup Software	100%	\$ -
Wan Costs	0%	\$ 6,000.00
Branch WAN Accelerator	-	\$ 37,220.00
WAN Accelerator Manager	-	\$ 4,485.00
Total Annual		\$68,648.00

As you can see by the preceding tables, the ROI can be significant. Additional operating costs can be saved because there is no longer a need to travel to the remote site to support the servers and backup systems.

If you would like to discuss WAN acceleration in greater detail or see a demonstration please contact myself (britton.almy@sarcom.com) or Tom Miller (tom.miller@sarcom.com).