

# FEDTECH

TECHNOLOGY INSIGHTS FOR LEADERS IN FEDERAL GOVERNMENT

## Rev It Up

### WAN optimization tools can accelerate sluggish network traffic — but map out a strategy before you take this route

by Caron Carlson, July 2008

It's an old adage by now — “old” in Internet years, that is. If you build bandwidth, users will come. But as WAN optimization technologies continue to advance and gain features, it makes them an increasingly appealing option to eke out more capacity from the network that you have in place.

The rub often is not whether to consider acceleration tools but which to use among the many available.

“This stuff pays for itself, usually in a year or two. It really can produce spectacular benefits,” says Eric Siegel, senior analyst at Burton Group. But that “spectacular” factor can lead an agency astray, Siegel cautions, when it comes to making decisions on the most appropriate product to buy or WAN optimization approach to take: “If you bring in just one [solution], you’ll buy it.”

WAN optimization takes many forms: some driven or enhanced by hardware, others more tied to software tools and policies.

With improved traffic management, high-priority data flows faster at the expense of low-priority data, but other optimization techniques can improve overall network performance by reducing the total bandwidth needed.

With compression technologies, data patterns are condensed into reference points on one end of the network and restored on the other end. This is a useful technique if large files are repeatedly sent with small changes. When identical files are transmitted frequently, caching techniques can provide the greatest bandwidth savings by temporarily storing application data near the users.

With protocol optimization techniques, standards that were not designed for the WAN are intercepted and carried the distance by a more WAN-friendly protocol. Usually a pair of acceleration appliances or software is deployed at each end of the network, but increasingly, software alone is deployed at remote offices or for workers who take notebooks on the road, analysts say.

For large, distributed networks, particularly those with centralized application, storage or server infrastructures, bandwidth optimization can provide multiple benefits:

- **Improved productivity.** If users can send and receive data more quickly, they can get more done and focus more on mission than on waiting for files.

That was an issue for the International Trade Commission before it began clustering its



Photo: Steve McAlister/Getty Images

routers. “One of the things we do is post United States tariff information that is accessed worldwide,” says Ted Leach, an IT specialist at the commission. “The inbound traffic would saturate the link, and people internally couldn’t even get out to a web page.”

- **Long-distance collaboration.** By improving bandwidth use, an agency can direct bandwidth toward specific needs and improve the quality of applications and services that require high real-time throughput.

By using an advanced signaling protocol, the Defense Advanced Research Projects Agency optimizes networks grown sluggish from applications such as video, voice and P2P file sharing, explains Col. Tim Gibson, a DARPA program manager.

- **Less need for capacity upgrades.** Obviously, a fatter pipe and infrastructure

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upgrades can speed traffic, but that usually comes at a hefty price.

To get the most bump for the buck from optimization, experts widely recommend trying out a few different tools before committing to one and reducing the number of possible tools by studying optimization projects at organizations running comparable network infrastructures. But first, it's vital to know your network and the traffic that flows over it. It's also important to set performance metrics that you can use once you launch your WAN boosters, ITC's Leach says.

#### Detail the Current Infrastructure

It may seem like an obvious first step, but failing to thoroughly analyze the network before trying to optimize it is a common pitfall, says Michael Suby, director of Stratecast, a division of Frost & Sullivan. It is essential to look at what applications and protocols are most important to the

organization, the distance the traffic travels, file sizes, whether data needs to be encrypted and whether users are in branch offices, remote locations, business partner sites or on the road.

"Start out with improved visibility on what applications

are running on the WAN," Suby recommends. "For many enterprises, there will be traffic that should not be there."

#### Narrow the Choices

There are myriad varieties of each optimization technology, and manufacturers have their own architectures and implementations. Combinations of tools often are packed into single offerings. To determine which combination of tools is best for a given network, it's a good idea to review a number of solutions used by organizations with a similar architecture and similar needs, Burton Group's Siegel says.

"The technology has been around long enough that you should be able to find reference accounts that have an architecture similar to yours," he says. "You want to find somebody who has been running a similar configuration."

#### Conduct a Pilot

Optimization tools should be tested in conditions as close to real life as possible, Siegel says. Reviewing other organizations' success stories is a smart step, but it isn't a substitute for thorough testing, which is necessary to ensure there are no integration, management or performance problems.

This raises perhaps the biggest

challenge in deploying optimization tools: integration with other network components, including measurement, management and security tools. Integrating optimization technologies with firewalls and access-control lists can be especially tricky, and trying to optimize encrypted data comes with its own set of challenges.

"Once the data is compressed, a lot of the data is missing. Your firewall looks at it and says, 'What is this?' and throws the whole thing out. What happens if you have a network router or switch fail-over? When you go to a backup router or switch, the data path moves," he says, adding that it is also important to consider how failed devices will be repaired or replaced.

#### Track Performance

Measuring improved performance over the WAN can be complicated because optimization technologies can interfere with network measurement tools, analysts caution. The most reliable way to measure success, users and analysts widely agree, is to monitor real transactions.

"When you start looking at file transfers, you have to look at the real-life performance," says ITC's Leach. "We're looking at [improved performance] from an overall download speed. Before, employees just waited

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patiently.”

### **Into the Fast Lane at Two Agencies**

#### **Agency 1**

##### **The International Trade**

**Commission:** Researchers at the commission regularly were unable to access Internet sites when the agency posted its Harmonized Tariff Schedule because inbound traffic bogged down the network, says Ted Leach, IT specialist at ITC.

After determining that ITC needed both more bandwidth and a way to optimize it, Leach installed a router-clustering device called WARP, from FatPipe Networks. WARP delivers WAN redundancy and optimization through traffic prioritization and quality of service.

“What I was trying to achieve was getting the most bandwidth out of multiple links,” he says. “The users will still suck up all

the bandwidth you can give them.”

#### **Agency 2**

##### **Defense Advanced Research**

**Projects Agency:** As part of its Control Plane project to increase both the speed and reliability of data transfers, DARPA uses acceleration devices from Anagran. The devices, placed at aggregation points in the WAN, monitor individual data streams or IP addresses, according to Col. Tim Gibson, a program manager at DARPA.

The Control Plane system negotiates a data rate when traffic is initially sent, and then it renegotiates that rate every second, avoiding slowdowns that TCP/IP normally experiences as a result of assuming that packet loss is due to congestion.

“From a wide area network perspective, the system works very well,” Gibson says. Without any additional Control Plane technology, the Anagran devices boosted link utilization — sometimes to rates as high as 90 percent — by managing the flows that pass through them, he says.