

COMMUNICATING WITH SAM

Squeezing More From Your Network and Carrier



Sam Johnston

Question:

Our head office is located in Ontario and we have five major branch locations in North America. We have consolidated our voice and data networks and have centralized Voice, ERP and collaborative applications running on our model 810 iSeries. The problem is that our VOIP requirements and our data requirements are growing and our carrier doesn't have next generation network capabilities at our location which means that our network will not scale cost effectively and the ROI on pushing voice traffic over the WAN will be reduced dramatically. How can we improve our data application performance without continually adding more bandwidth to our network?

Answer:

Ensuring that end users receive quick response times over a WAN can present challenges, considering the limited speed and capacity, the effects of latency (round trip times), and the contention of Voice and Data applications for a fixed amount of bandwidth. Web-enabled applications like Notes are very bandwidth intensive applications and can quickly consume resources, resulting in poor response times and end user dissatisfaction. In addition, mission critical and collaborative applications can be affected by non-critical traffic like FTP, file, and print.

Given this situation it becomes clear that some form of WAN Optimization, Control, and Application Acceleration

is essential for balancing the needs of all users and applications across your WAN connections.

As networking has evolved there have been several single function separate box solutions that provided compression, caching, acceleration, bandwidth management, monitoring, and reporting. The problem with these point solutions and separate devices is that IT already has too many boxes to manage, and that most of these devices don't work together to provide an optimal solution.

What has emerged is a scaleable set of products from Juniper networks that incorporates all of these functions and dynamically tunes itself based on feedback

from each metric resulting in better overall functionality, security and simplified management. The DX, WX/WXC family of Juniper products have been tested and certified interoperable Lotus Notes/Domino, Websphere Portal and the IBM suite of Workplace solutions.

These products are installed in your network between your Ethernet switch and your WAN edge router at each point in your network. Once the devices are in place all traffic over the WAN will pass through two devices. (See **Figure 1.**) These devices will fail open so if a failure occurs the traffic will pass through without optimization. If redundancy is required, two devices can be deployed — one behind the other — in an inline configuration.

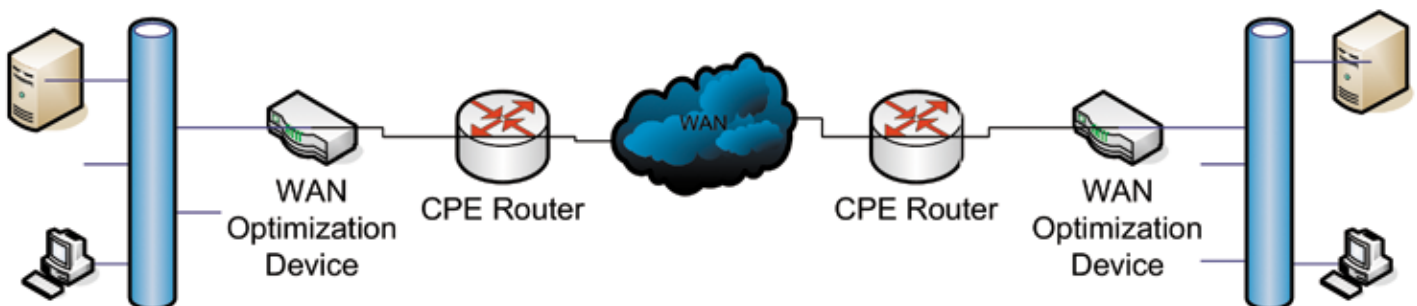


Figure 1. Inline configuration for redundancy

Optimizing Capacity

As you identified, the classic method for increasing WAN capacity is to increase the size of the pipe to the carrier. This can be expensive and sometimes it is not practical or available. The more sensible approach is to make better use of the capacity that you have in place today. In order to accomplish this we need a device that takes a comprehensive approach to communication characteristics in use today.

One method for increasing capacity is to transmit less by eliminating redundant transmissions. Juniper accomplishes this through their patented MSR technology, which uses a memory-based pattern

dictionary to eliminate data repetitions that occur across a broad range of applications. Some businesses can gain a two-fold increase or better on their existing links.

Network Sequence Caching

In addition to MSR the WX/WXC products have a complementary technology called Network Sequence Caching, which relies on embedded hard drives to recognize larger data patterns across all applications. The use of disks allows each device to store from tens to hundreds of gigabytes of data at each end of the link. If we consider a collaborative document of 50 pages that is sent on Tuesday and one page is updated on Wednesday and resent, the sequence

caching will eliminate the 98 % of the document which is an exact repetition of the previous transmission and reconstruct the updated document at the other end of the link using cached data.

Transmission speed and throughput can be dramatically improved by eliminating the delays and latency caused by round trip acknowledgements which are required by the underlying protocols and applications. In order to be effective, these devices contain both TCP acceleration and acceleration techniques for a broad range of applications including email, file services, etc.

Improving Network Performance

From a network perspective, the Juniper device improves performance by terminating the TCP protocol locally and using its own more efficient protocol to communicate to other Juniper devices, increasing performance across the WAN. They also have forward error correction techniques transmitted along with the data stream that enable the recreation of lost packets without needing to retransmit them.

The protocols of many applications can limit throughput as much or more than TCP network protocols. Many applications send data in small blocks requiring an acknowledgement for each block, which can accumulate to thousands of round trip messages per transaction. As an example HTTP requests objects one at a time, so numerous requests are required for each Web page loaded, resulting in dozens of round trip messages. They have an AppFlow technology that fills the available bandwidth by sending many data blocks and objects in quick succession resulting in improved application performance.

QoS

Even with the above measures in place there will still likely be times when there won't be enough bandwidth to handle all the traffic all the time. Some type of QoS is necessary to ensure that the proper service is given to the various types of traffic flowing across your network to your branch locations.


The 5th Wave

By Rich Tennant



"It's your wife Mr. Dinker. Shall I have her take a seat in the closet, or do you want to schedule a meeting in the kitchen for later this afternoon?"

For example, voice traffic must be considered “real time” and given priority over all other types of traffic. This has been a time consuming and complex job for many IT professionals. The Juniper WX operating system uses wizard-based QoS templates that translate business priorities and traffic types into a QoS configuration that is simple to implement and manage. Many WAN optimization devices have no understanding of the opposite end of the link. In order for the QoS policy to be effective the device needs to understand the WAN as whole and which locations have QoS and which locations don't. By taking a dual sided approach to QoS, Juniper can apply the correct policy to that specific destination.

Data traffic can have multiple levels of priority. ERP and WEB applications can be considered high priority with “near real time” service requirements. Other data traffic such as print may be given “best effort” service. Juniper devices can inspect the traffic at all levels of the network stack and look inside the payload to differentiate service classes. This is important in a Citrix environment that could contain both ERP and Print traffic that would look the same at layer 3. Through the use of technology and policy, you should be able to “squeeze” more data through your network without reducing the allocation given to voice traffic. 

Sam Johnston is a partner and Chief Technology Officer of Intesys Network Communications Ltd., providing value-added networking and e-commerce solutions to the iSeries community. He can be reached at (416) 438-0002 or via e-mail at sjohnston@intesys-ncl.com. Any TUG member wishing to submit a question to Sam can forward their typewritten material to the TUG office, or to Intesys. The deadline for our next issue is Friday October 13, 2006.



When Insults Had Class

“He has all the virtues I dislike and none of the vices I admire.” - Winston Churchill

“I have never killed a man, but I have read many obituaries with great pleasure.” - Clarence Darrow

“He has never been known to use a word that might send a reader to the dictionary.” - William Faulkner (about Ernest Hemingway)

“Poor Faulkner. Does he really think big emotions come from big words?” - Ernest Hemingway (about William Faulkner)

“Thank you for sending me a copy of your book; I'll waste no time reading it.” - Moses Hadas

“He can compress the most words into the smallest idea of any man I know.” - Abraham Lincoln

“A modest little person, with much to be modest about.” - Winston Churchill

“I've had a perfectly wonderful evening. But this wasn't it.” - Groucho Marx

“I didn't attend the funeral, but I sent a nice letter saying I approved of it.” - Mark Twain

“He has no enemies, but is intensely disliked by his friends.” - Oscar Wilde

“I am enclosing two tickets to the first night of my new play, bring a friend... if you have one.” - George Bernard Shaw to Winston Churchill

“Cannot possibly attend first night, will attend second... if there is one.” - Winston Churchill, in reply.

Submitted by Neil Palmer Cambridge, ON

COMMON Education Foundation

The COMMON Education Foundation promotes higher education in the information technology area. It does so in several ways including awarding tuition reimbursement scholarships to students attending accredited universities, and by providing scholarships to instructors at an Academic Initiative for System i college to attend COMMON conferences and IBM Summer School.

To fulfill these and other goals, the Foundation raises money through a variety of methods, one being the Silent Auction held at each COMMON conference.

This fall, TUG will be supporting this effort by contributing prizes for the Silent Auction, and we invite you to join us! If you would like to participate by donating a prize (or prizes), please contact the TUG office. (The contributed items must be non-perishable.) If you would rather make a monetary donation to the foundation, that is also acceptable.

TUG members attending the COMMON Fall Conference will deliver the items to the Foundation booth on September 16th in Miami Beach.

Please consider giving to this worthwhile cause. 