

The
ESSENTIAL GUIDE
for
Upgrading
your **Network**

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CHAPTER 5

Case Study: Tomorrow's Network—Today

By Andrew Hickey

Newer and faster applications, increased need for bandwidth, and additional users are in store for almost any enterprise network, forcing companies to re-evaluate network resources and redefine their model for a secure, resilient, application-aware, global network. Achieving that network sometimes requires new technology and new equipment, as well as new skills for networking professionals.

In the following examples, you'll see how two companies upgraded their networks in strategic areas to improve workflow and processes while at the same time keeping in mind the business cases for their upgrades. From data center and server consolidation and bandwidth upgrades to WAN optimization and VoIP preparations, these companies looked to new technologies and tools to get the most out of their critical enterprise networks. There may have been some hiccups along the way, but these companies addressed challenges with

an eye to the future, knowing that the hurdles they overcome today will help their networks stand up to tomorrow's business challenges.

Application acceleration cements consolidation project

What started as a simple application rollout for Ozinga Bros. Inc., a concrete manufacturer in the Great Lakes region, led to a much more intensive project in the long run, resulting in data center and server consolidation and a jump into the application acceleration arena.

Ozinga, which operates 21 sites across its distributed network, owns and operates 500 trucks that are vital to its operations. Trucks need maintenance, but with siloed data centers and server farms, there was no single point of reference to track that maintenance. Some branches used software. Others used a chalk board with scribbles to indicate that trucks were up to date with repairs and other work.

The company always had a wide area network (WAN) in place, but was lacking the tools to tie all 21 locations together cohesively. Tom Allen, Ozinga's IT director, said the company needed a method that would allow truck mechanics to communicate with one another and a place to keep

an inventory of maintenance records and other pertinent information.

The first step was data center consolidation. The company, which had data centers scattered throughout its 21 locations, moved to a single data center in a central location. Along with it, the company also consolidated its Citrix server, putting that in the same central spot. In each branch location, the company rolled out client terminals for mechanics to access the maintenance software over the WAN.

The maintenance software, called TMT, is necessary for several reasons: It saves Ozinga money because it avoids overstocking of parts; it ensures that the fleet of trucks is well maintained, avoiding unexpected repair costs; and it can save money in liability because Ozinga will have a record of the trucks' maintenance to make sure that everything is up to date.

To ease into the data center consolidation project, Allen said, the company moved slowly and added one application at a time. That allowed them to monitor each application's performance on the IT side and to gauge user perception. Ozinga also added and upgraded WAN monitoring tools, which Allen called "a very important step forward" for the consolidation

project.

Despite all the planning, when the TMT software was rolled out over the WAN, mechanics began experiencing problems immediately.

"We thought this would work great, and it didn't," Allen said. Mechanics encountered performance problems and freezing with the maintenance application.

To try to quell the problems, each site attempted its own fix. One site added bandwidth. Another tried using quality of service. But nothing worked. Consultants were called in for a second opinion but could find nothing wrong. Still, the application was plagued with jitter and freezes and deemed worthless by the mechanics whose lives it was supposed to make easier.

"Basically," Allen said, "it came down to this. It was a million-dollar rollout of this application that came to a halt because the mechanics said it was unusable."

Allen said he lost a lot of sleep racking his brain about the problem. His colleague, Alex Kropiewnicki, said he "turned to prayer."

The issue sparked dozens of meetings, and several potential solutions were discussed. One suggestion was to move everything to a Multiprotocol Label Switching (MPLS) network, but

Allen said that option was quickly dismissed because of the cost involved. Running MPLS to 21 sites would have added thousands of dollars a month to a budget that was already stretched too thin for comfort.

“Fortunately, we never got to that,” he said, adding that Ozinga wanted to keep the WAN running with relatively inexpensive connections strung together with VPNs, an architecture that in the past had provided adequate performance.

Removing all video from the WAN was considered, because video applications are notorious bandwidth hogs. Ozinga had been using video for years to monitor concrete production.

“We had the same issue with jitter and packet loss,” Allen said. The company determined that it had plenty of bandwidth for both video and the new truck maintenance applications to coexist in harmony.

Someone suggested WAN acceleration, but Allen and his crew were skeptical because most attempts to alleviate the problem had already failed. “We didn’t have high hopes for it,” he said.

Ultimately, the company tried it, using Citrix’s WANScaler application accelerators. Application performance improved, and jitter, latency and congestion disappeared. The mechan-

ics picked up on the change right away, Allen said. Once the 30-day product trial ended, the phone started to ring—with mechanics calling to ask what happened—because the application’s performance had reverted to its old, slow ways. Ozinga was able to extend the trial until it could install accelerators at each location.

Having that application taken care of and out of the way, Allen said, let his team return its focus to its larger network upgrade projects.

“We’re on a trend to continue to consolidate and move more applications into the central data center,” he said. “We still have some applications distributed, like the mechanics’ software used to be, but we’re moving a lot of that.”

3M prepares the network for VoIP

Accommodating roughly 300 locations in 80 countries, 3M Corp. is responsible for a lot of traffic flowing into and out of its network. And with a strong Web presence and increasing use of internal Web-based applications, the amount of internal and external traffic traversing the network has been increasing by several orders of magnitude.

According to Murray Butler, senior network analyst with 3M, that boost in traffic prompted networking pros

at the company to take a step back and re-examine the network to determine what types of strategic upgrades would aid in helping the traffic flow better and more reliably, while also keeping costs as reasonable as possible.

“Our big upgrade recently has been egress bandwidth,” Butler said, adding that his team had to allow for more traffic to come in and go out. “There really just seemed to be a general increase in Web traffic coming in and going out.”

Internal applications, which are mostly Web-based, included site-to-site applications, enterprise planning tools and other demand-side applications. That requires funneling a lot of traffic from external sites into the same pipes.

Using a centralized architecture, 3M attempts to provide most of its branch office server needs from a single location, Butler said. The company has whittled down the number of servers to avoid redundant purchases and equipment, ultimately cutting costs, and it has built Web-based applications and must allow them to be accessed from almost anywhere through a secure SSL connection.

“Traffic has just increased over time, and that made our current lines a bit over-utilized in some places,” he

said. “We have to make sure we have good baselines.”

The bandwidth upgrade, while necessary to account for current traffic increases, also has an eye to the future, Butler said, as 3M continues to examine its plans for VoIP. While VoIP has been much contemplated, he said, the method of deployment has been an “ongoing debate.”

Things can get tricky, because each business unit within 3M is fairly autonomous but still needs to use the company’s centralized architecture for access to business-critical applications.

“VoIP is one facet of that,” Butler said. “How can we do that and make it a generalized offering? How can we make it scale up and down? I need things to scale up and down.”

Many VoIP vendors 3M has talked to offer ideas about how to scale up, he said, but scaling down—accommodating not only offices with 1,000 users but offices with fewer than 10—is a puzzle. At the same time, he said, 3M must determine how to manage VoIP centrally for consistency and supportability across the entire network.

Butler said he knows the benefits of a VoIP deployment, namely cost savings both on the back end and with connectivity, but figuring out the best

way to utilize it while upgrading the network to support it is the key challenge.

Working voice into the existing data lines will reduce provider infrastructure while also reducing 3M's need to utilize that additional infrastructure, something Butler called a "win-win."

Still, Butler said, there are a few nagging problems before VoIP can be given the green light. First, where will QoS play? "If I can do it and I can do QoS, I could have a very nice way of managing communications from here," he said.

Butler is talking to vendors to find a

solution that fits the company's unique need to scale both up and down. From there, he plans to get the back end up and running—converting the standard phone system 3M is using now to the existing data lines is a good starting point, he said, before cutting over to VoIP. Then 3M would have to get VoIP to the desktop, deploying Power over Ethernet for every endpoint.

But still the big question is: "Do you want to mix the data and voice network or not?" Butler said. "I vacillate on that one daily. There are a number of steps to it, all to get it the way we want it. It's a tall mountain

Looking beyond VoIP to UC

THE BUSINESS GOAL for VoIP, said Murray Butler of 3M, is simple: It gives users portable, accessible and constant availability. Currently, many users have a cell phone, a desk phone, a BlackBerry and a PC or laptop. VoIP, coupled with unified communications (UC) tools, has the potential to break down those siloes of communication.

"It gives them one point of reference, one phone number," he said. "It gives them one point of presence."

And wrapping a UC model with capabilities like IM, chat, video and Web conferencing can add a great deal of flexibility, Butler said.

"I want my salesperson to be able to give a client a nice, elegant business card with just one phone number on it," he said. "But to get to that level, planning, projects, infrastructure and amazing amounts of scale are required for each level. We're starting with baby steps."

to climb.”

And if bandwidth upgrades and VoIP conundrums aren't enough to keep the network staff busy, 3M has a few other upgrade tricks up its sleeve, Butler said, including changing and updating the streaming media and caching proxies and testing out WAN optimization tools in the lab.

“It's a new thing, something we have to make valuable and attractive before we deploy it,” Butler said of WAN optimization. “We do it somewhat with Web application proxies and caching.”

Also, he said, a lot of the tools 3M has bought can already handle the application load without the benefits

of optimization, such as updated router cards that can handle the line speed.

Butler said his view of the network is that it is a tool that offers easy and ubiquitous access for users. He wants to fulfill the “expectation of dial-tone” and craft the network so it just works.

“My own personal view of IT is ... IT is an enablement to help the business function better, quicker and faster,” he said. “Network improvements facilitate that. As we're improving the network, we're improving its availability and stability for the users. It just makes life easier for IT and for the users.” ■