Resolving Network Performance Issues with Real-time Monitoring

A Series of Case Studies

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TPX

INTRODUCTION

Maintaining a healthy network is a vital component of maintaining a successful business. Many organizations rely on data centers and SaaS applications for their day-to-day operations, and these in turn rely on a robust network connection. Network downtime could very easily become downtime for the entire business. Corporate networks are complex by their very nature, connecting together devices, servers, office locations, and the Internet. Because of all of these moving parts, isolating the root cause of an issue without the right tools is challenging, if not impossible. For example: is it an issue with the local network, or is it due to a problem on the service provider's end?

A managed network monitoring service will provide you with the real-time performance data that you need to answer questions like these. The managed service provider will monitor and track trends in your network's health on an ongoing basis, and they will alert you if they find any network performance issues. This will help you to ensure that your IT assets continue to deliver the desired performance to your business.

TPx's managed services team has more than 20 years' experience managing IT services, and in that time we have solved a myriad of issues for organizations like yours. In this e-book we'll explore the network performance issues of three of our clients, and we'll reveal how our real-time monitoring gave them the data they needed to resolve those issues.
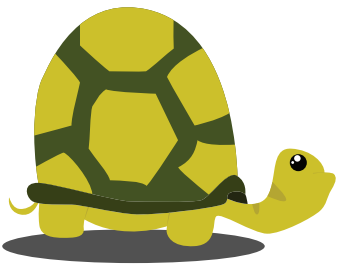
ELIMINATING NETWORK LATENCY

We begin with the story of a non-profit that had their network latency issues suddenly escalate from an inconvenience to a show-stopper.

This organization has many remote sites, all connected to a main campus that houses their Internet connection and IT systems. The remote sites had experienced a considerable amount of latency for some time, but it didn't become an urgent issue until the organization decided to deploy a major new system.

Leading up to this deployment, the non-profit wanted to place all workstations and printers on their domain — about 200 devices in all. The ongoing latency issues had prevented them from placing their remote sites on their domain before this point.

When they added one of the remote sites to the domain, the network at that site became completely non-functional for all Internet, server, and web application usage. Users experienced an agonizing delay of 10 to 15 minutes waiting for their workstations to finish the login process. The main site also began to experience significant slowness when using Internet applications.

Fortunately, TPx's managed services engineering team was standing by and ready to help. We immediately deployed a network health monitoring appliance and mirrored the LAN uplink port on the main campus to capture all traffic flowing through the firewall at that site. From this analysis, we identified a trend of large data spikes in recurring intervals moving out the LAN uplink ± correlating with large data spikes moving to IP addresses at the remote site. The traffic was coming from two domain controllers, which were updating group policies at recurring intervals.

Drawing from their knowledge of Microsoft systems, our network engineers identified the root cause of the issue: a system folder that replicated out to domain members. Generally, this system folder is very small; but in this case, a file of over 100 MB had been improperly saved in that folder on both domain controllers. Even before the remote sites were placed on the domain, this rather large file was being replicated out to individual desktops across the VPN on a regular basis. As a result, the network connection was saturated at both the main campus and the remote site.

Removing that large file resolved the network latency issues. The nonprofit continued to place all devices at the remote sites onto their domain with no further network congestion or interruptions.

FINDING THE ROOT CAUSE
OF BANDWIDTH ISSUES

These days, high-speed Internet access is so readily available that most people don't think twice about using bandwidth-heavy applications such as streaming music or video. However, in a business setting, this seemingly limitless Internet usage can have unintended consequences.

To illustrate this point, we turn to the story of another nonprofit organization that works with TPx. Unfortunately, this organization was randomly experiencing significant drops in bandwidth speed that did not appear to have any common denominator. Users at their remote sites complained of periodic network issues at various times throughout the day.

Much like the first case study, this nonprofit also has several remote sites connected to a main office. Additionally, the main office is home to a Citrix server cluster. Because Citrix consumes very little bandwidth, they opted to use T1 circuits to the data center.

One of the remote sites experiencing bandwidth issues was accessing the Citrix server farm over a T1 line. They wanted to validate that this circuit was not the root cause of the issue. They suspected that something else was causing this problem, but they didn't know what that issue was or what

steps they would have to take to resolve it… and they didn't want to waste time throwing solutions at the problem to see which one would work.

TPx's team of managed services engineers was on the case. We placed network health monitoring appliances at the data center and at the branch office that received the largest number of complaints. The nonprofit had documented the times that they were receiving the most complaints, so we reviewed the packets at those times and isolated the traffic types that were using the highest percentage of available bandwidth.

Using this methodology, we traced the traffic back to an individual at the remote site who was accessing the Internet with their local computer instead of their Citrix session. And that user was doing more than just web browsing — the user was on Facebook, downloading content that consumed a good deal of bandwidth. Since the T1 was originally installed to handle just Citrix traffic, all of the user's Facebooking caused the line to exceed its available capacity.

The TPx team's analysis gave the nonprofit the data they needed to make a sound decision. They now knew that to resolve the issue, they'd have to either implement a policy to limit web browsing from local systems, or increase the available bandwidth between the remote site and the main site.

DO YOU REALLY KNOW WHAT YOUR BANDWIDTH IS BEING USED FOR?

RESOLVING CONNECTIVITY ISSUES

Our final case study takes us to a local school district. Like many other schools, they've invested significant time and effort into delivering an innovative technology experience for their students, faculty, and staff. Their teachers have come to rely on e-mail and Internet connectivity, accessed on classroom computers and projection systems, to provide lessons integrated with Internet content.

As is the case in many towns, this school district has several school buildings and an administrative building. All of these buildings receive their network connectivity from the same Internet Service Provider (ISP).

The district called on TPx when one of their schools started to have significant network issues. Users were losing connectivity to their internal mail server, and they experienced latency whether they were accessing files on the network or browsing the Internet.

The TPx team placed two monitoring appliances on their network, one at the school and the other at the superintendent's office. We created several paths from both of these appliances: to the mail server, to other servers in the environment, and out to the Internet.

We immediately saw that the path between the school and the main office did not indicate the available bandwidth promised by the ISP. Upon further review, we found that the ISP had a duplex mismatch between the LAN port of their router and the uplink port on the school's switch. Our managed services engineers contacted the ISP and worked with them to ensure that the port was statically set to full duplex on their router. Correcting this duplex mismatch resolved most of the speed issues for both internal and Internet traffic.

Once we had collected a full day's worth of data, we also noticed that the path to the mail server was dropping connectivity. This wasn't happening on any other paths, so we recommended swapping out the patch cable and continued to monitor the issue.

After the school district replaced the patch cable from the mail server and the main site's switch, they had no further support calls to their help desk on the issue. Students and teachers were once again able to leverage technology in the classroom with no problems.

ABOUT TPX

TPx is the premier managed services carrier that delivers comprehensive communications solutions to 75,000 business locations nationwide. Businesses nationwide trust TPx to manage their mission-critical network services. TPx's award-winning, enterprise-grade unified communications, managed IT, and network connectivity services empower companies to unleash productivity by streamlining processes, proactively monitoring systems, and staying current with rapidly-changing technology. TPx backs its services with a zealous commitment to Customer Care, including a network uptime guarantee and 24/7/365 live-answer technical support.

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