

## Network performance and the cloud

by Katie Braband, Vice President Channel Development, PathSolutions

The hype surrounding the cloud has clouded a good many basic business and performance issues. The idea of moving business processes into the cloud to reduce expenditures is gaining momentum. It can be a good idea, but many companies have little notion of the impact the transition to the cloud can have upon the business - or even if the performance of their companies' applications and systems will be at least as good as that of their existing operations.



*Katie Braband is the Vice President for Channel Development at PathSolutions a provider of automated network intelligence gathering solutions. Ms Braband, an experienced telecommunications professional, has strong ties to the network access, reliability and performance markets. Ms Braband served as Vice President for Business Development for Datto, Inc., a provider of backup and disaster recovery solutions, where she received several industry awards for her achievements. Among these were inclusion in Nine Lives Media's MSPmentor 250 list, a global report that identifies the world's leading managed services executives, entrepreneurs, experts and community leaders.*

*Katie Braband is a graduate of the McGuire Centre for Entrepreneurship at the University of Arizona's Eller College of Management.*

'Cloud buzz' has reached a fever pitch around the telecom industry over the last six months. Even Microsoft has gotten in the act with its 'To the Cloud' campaign. For an enterprise, the concept of outsourcing or moving certain business processes into a hosted environment isn't necessarily new, but it seems that the desire to reduce capital expenditures by pushing critical business processes to the cloud is gaining more and more momentum.

While the economic arguments can be very compelling, it is just as important to peel back the covers and understand how applications and services use the existing network and the impact of the network connection's transition to the cloud. Fundamentally, if the resources used by business applications move to the cloud, it is crucial that access be no less

restrictive than if they remained connected to the local backbone. Businesses still need to operate efficiently and profitably regardless of whether they connect their business tools and services to resources on-premise or in the cloud.

### Network behaviour

It is important to examine how business functions and applications impact network utilization, and how the network, in turn, effects application performance and operation. For example, in a contemporary customer service centre, the agents are connected to a multitude of networked resources which give them ready access to customer information, inventory levels, order status, product data, voice communications,

and other electronic communication channels, including Web chat, IM, and email. Consider that each of these separate applications could be described as a thread stretching from the agent's workstation to a unique, yet mission-critical destination - like a database, inventory management system, or communications server. A simple database query may comprise of literally hundreds of unique data messages exchanged between the agent workstation and a server on the network. In a call centre with tens or hundreds of agents, the number of transactions streaming through the network at any given moment can be staggering.

In a local area network (LAN) environment, most of these threads peacefully coexist with each other, and with the multitude of

threads connected to other agent terminals, and between other users and applications. If congestion occurs on a LAN link, packets may be buffered for a very short time before they are transmitted. This creates a barely perceptible delay on the part of the user. Within the enterprise, transit times are typically in the 2ms to 10ms range. Not even the blink of an eye. Delays of this order are not typically noticeable to a user, but as congestion increases, delay-sensitive applications like Voice over IP (*VoIP*) can be the first to indicate a problem.

VoIP and video in the LAN environment can be a barometer of LAN performance. Everyone knows what they like in a telephone conversation - clarity, no delay, and no dropouts. Since voice packets must arrive in the correct sequence and without loss, a poorly managed LAN can cause noticeable performance issues that are obvious to many, if not all, telephony users. People may not notice a 150millisecond delay in a data packet, but they will certainly complain when words are dropped and delays impede conversation on a voice call, or their video-conference fails during an important sales presentation.

#### Extra bandwidth doesn't solve the problem

Historically, with data-only networks, organizations would solve network slowdowns by throwing more bandwidth at the problem. LAN links were upgraded from 10Mb per second to 100Mb per second and later to 1Gb per second - far more bandwidth than the endpoints could possibly use. This excessive bandwidth can mask a multitude of sins. Even in the case of ten per cent packet loss, lost packets are retransmitted, and the user really doesn't notice that a five-minute file transfer takes 30 seconds longer. When addressing Wide Area Network (*WAN*) bandwidth requirements, the cost element puts a damper on employing excessive bandwidth.

While most network administrators typically want as much WAN bandwidth as possible, this bandwidth is typically purchased sparingly. As with any other business resource, managers are looking for acceptable performance at an acceptable price. As more mission-critical services rely on the WAN connection after the transition to the cloud, the performance of the WAN link and the resources in the cloud have an increasing impact on business performance and profitability.

Services like VoIP and video are highly intolerant of packet loss or the delays caused by buffering. As real-time applications, there is no opportunity to use extra LAN or WAN bandwidth to re-transmit lost packets, leaving the user with poor or unintelligible communication. For this, and other delay-sensitive applications, the 'just add more bandwidth solution' is ineffective.

#### Moving applications to the cloud

Going back to the concept of a string connecting the call centre agent's workstation to the order entry system server, consider how that connection is affected by moving the server off the LAN and into the WAN or the cloud. In the LAN, packets may traverse just three or four links and perhaps a switch and a router between endpoints. Identifying faults in the network that can contribute to packet loss and poor application performance is easily managed with the proper monitoring and optimization tools. However, when applications begin to reach out to the WAN for resources, the impact upon performance can increase dramatically.

With cloud-based services, a large variety of links, devices, and providers are involved in carrying data for the application. Any one of these various elements can introduce packet loss or delays - and all are out of the hands of the local network administrator. The potential for a 'blame game' and finger-pointing in response to poor performance is quite high. Again, proper network monitoring and optimization, as well as a comprehensive understanding of how applications use the network, are fundamental elements for a smooth transition and successful business operation.

However, given the many parties and elements involved in a cloud-based solution, identifying and troubleshooting performance problems can be complicated. Continuously monitoring the health and status of all links and devices involved in providing services is a powerful way to ensure performance and help eliminate finger-pointing and facilitate business operations.

#### Throttling productivity and communication

Performance failures in the larger cloud environment can lead to serious business problems. The impact upon customer service, and customer satisfaction, can be dramatic if significant delays are introduced

into the communications stream. Remember those hundreds of data transactions related to a simple database query. If sufficient bandwidth in and out of the network is not available, each of those transactions could be delayed and could result in irritatingly slow responses and reduced call centre productivity. Money can be lost as agents wait for information - possibly much more than that saved by moving network resources to the cloud.

In addition, as more application data traverses the portal to the WAN, the probability of degraded VoIP performance increases. So if a business is not careful, not only will customers be on the line longer waiting for customer service action, they may have to do it over a poor voice connection. While neither of these conditions alone is necessarily devastating, in combination they can drive customers away.

#### Is the cloud a good choice?

The point is not to dissuade businesses from taking advantage of the significant cost savings potential of moving resources and applications off-site. The CAPEX and even OPEX savings of cloud solutions have been demonstrated over and over again. However, if a business is to have a successful transition from a 100 per cent LAN-resident application infrastructure to a hybrid or fully cloud, or WAN, resident infrastructure, they must understand the behaviour and demands of all of the applications using the network. Businesses must - and thoroughly - understand the details of their network's usage and health. Detailed analysis and monitoring of network utilization and performance is a critical part of gaining the insight needed to assure a smooth transition. After the transition, active performance monitoring of both LANs and WANs can help head-off congestion and delay issues before they impact customer service and satisfaction.

The bottom line of transitioning to a cloud-based network environment is that a business must understand how mission-critical applications and services actually use the network, and must ensure that all of the pipes that connect to the cloud can handle the load. Without this, the cloud will remain a mystery, and may never deliver the value that many businesses expect. ●