

AN INTERVIEW WITH DR. PIETER POLL, QWEST CTO

A discussion about the trends and technologies shaping the future of telecommunications in today's enterprises

EXECUTIVE OVERVIEW

While IP data traffic continues to grow at a near exponential rate, enterprises must manage that traffic while reducing costs, meeting initiatives for "green" computing, and providing adequate security in an increasingly risky cyber world. To achieve these goals, they are looking to service providers like Qwest to build infrastructures that will help them scale and grow efficiently and cost-effectively, and take advantage of the new technologies available to them.

In this interview with Qwest's Chief Technology Officer (CTO) Dr. Pieter Poll, you will learn how carriers like Qwest are building the infrastructure to meet business demands now and into the future. Dr. Poll discusses the trends and technologies that today's enterprises will leverage as they migrate from legacy technologies to an IP-based network architecture. He will also discuss how Ethernet and multi-protocol label switching (MPLS) are playing a part in next-generation networks, and how companies can become more productive by deploying these technologies.

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Pieter Poll, CTO of Qwest Communications

Q. What are the major trends in business telecommunications services that are affecting large enterprises?

A. There are quite a few trends relevant to enterprises. Enterprises continue to find ways to be more cost-effective, and to do so they're focusing on core business activities—not IT. Consequently, there is much greater interest in cloud computing concepts such as software as a service (SaaS) and cloud computing, which offer benefits of scale in technology costs and the ability to handle peak loads without additional capital expense. Along the same lines, many enterprises are looking to managed service providers who use their own gear while delivering customized solutions.

Q. What pressures are IT departments facing?

A. Large IT departments must implement technologies that foster scalability and future-proof their networks in anticipation of changing business needs. Economic pressures have always been present; now it's even more critical for companies to align IT with their core missions and objectives. New technologies like IP and Ethernet play a part in preparing for future business demands. Companies are implementing Ethernet and high-speed wave services to facilitate the exchange of information, which enhances collaboration and helps enterprises react quickly when they need to, for example, in disaster recovery scenarios. To this end, there has been far greater interest in forming partnerships.

Telecommunications carriers like Qwest are bundling services to create end-to-end solutions that suit varying business models. We're offering wave services, Layer 2 Ethernet transport, Layer 3 data services, and more, so that our customers can create the right mix of services that works for them. Some are transitioning to voice over IP (VoIP) as a managed or hosted solution, again leveraging cloud offerings. VoIP doesn't just offer a cost reduction, but it opens the door for other new, mission-critical applications that people today need to collaborate and communicate effectively. High-definition teleconferencing incorporates VoIP and other elements to enable face-to-face, real-time iteration, allowing companies to reduce travel costs, support green initiatives and make faster, more informed business decisions. These technologies are starting to pick up quickly for Qwest and other carriers.

Q. What's unique about the Qwest network, and what is Qwest doing to prepare the network for its customers' future business needs?

A. The Qwest network is a significant component of global Internet. It's ranked in the top 10 globally, and it doubles in size roughly every 18 months. To meet the needs of its customers, Qwest is continuing to invest in its core IP network, as well as our ultra long-haul network, which we've started to overlay with higher capacity systems. At the metro's edge we continue to invest in metro Ethernet technology. We're aggressively deploying reconfigurable optical add-drop multiplexer (ROADM) technology to handle our intra-metro transport. The RODAM network offers OC-768 services and is 40 Gigabit capable, and we continue to improve network scalability and availability and accommodate our customers' changing business needs. Our network can also provide IPv6 services natively on our public and private networks to help our customers plan for their future needs as the IPv4 addresses start running out. The combination of our core IP network and the CyberCenters readies us to meet our customer demands for cloud computing and/or SaaS.

Q. What has Qwest implemented to ensure security for its network?

A. Qwest maintains a second-to-none security paradigm in everything we do in the network. In terms of the core security of our network, it's a highly protected network, using multiple layers of protection for each network element and customer service. Qwest's suite of security services help to harden and protect enterprises that have to deal with public IP traffic. The core IP network is fully privatized, i.e., it does not carry the Internet routing table, and there is no crossover between public and private services. The services operate within separate risk domains, so there's no visibility to Internet routed IP addresses in the private domain and vice versa. With all the attention to security, Qwest has an extremely secure infrastructure that is trusted by large enterprises.

Q. How is the use of Ethernet evolving? What technologies are needed to support the Ethernet evolution?

A. Ethernet as a technology has evolved considerably and stands to enable even more cost-effective data transfer than traditional synchronous optical networking (SONET). Ethernet offers a ubiquitous interface and can be deployed on copper-based solutions, opening up possibilities in areas where fiber was not readily available.

Qwest is helping to evolve the Ethernet network with MPLS, which lets us extend Ethernet boundaries between traditional service areas with inherent reliability and scalability. MPLS fast reroute allows rapid restoration when you need it, for example if there's a switch failure. In a virtual local area network (VLAN), which relies on spanning tree protocol (STP), it takes a long time to reroute traffic if there's a network failure. Even the newer Rapid STP takes multiple seconds in most situations, and convergence time increases as the network grows. By contrast, MPLS fast reroute reduces the convergence time to sub-second range so that customer applications are not disrupted. Qwest is also implementing class of service through the Ethernet core, so that the customer can differentiate their traffic based on their applications and expect Qwest to treat the traffic accordingly. Qwest is also pursuing in-service software upgrades to enable higher service availability.

Q. What capabilities does the Qwest MPLS network enable?

A. Qwest has implemented Layer 3 and Layer 2 VPN capabilities across the MPLS infrastructure to provide customers more versatile, economical ways of connecting geographically dispersed sites. If customers need Layer 3 connectivity to connect sites together, they can use the Layer 3 VPN, regardless of the access technology, i.e., frame relay, ATM, Ethernet, POS etc. However, if customers desire to run proprietary routing protocols, such as OSPF or EIGRP, they can use Qwest's Layer 2 VPN service. Using VPLS, customers can operate sites in different cities together, transparently, as though they were on a common Ethernet network. This improves collaboration in business environments. This MPLS architecture also allows for fast re-route and rapid recovery in case of link and router failures. Qwest also enables the bridging of legacy Layer 2 services like asynchronous traffic mode (ATM) or frame relay to be transitioned to Ethernet, with common MPLS technology creating the bridge, giving customers a steady and cost-effective migration path from their legacy networks.

Q. Can you provide an example of how the Qwest Network is meeting the demands of customers today?

A. An example of a technology made possible by the Qwest network is VoIP. Among both businesses and consumers, VoIP is gaining popularity because of its many benefits, including lower costs, portability and a rich feature set. Qwest is addressing this growing demand for VoIP capabilities with three options: true hosted technology, integrated access with private branch exchange (PBX) voice technology, and managed voice services over IP. Qwest can implement intelligent IP endpoints that communicate to feature server intelligence in the network. We can also connect routers at the customer premises to an existing PBX, IP or TDM based, or key system.

In a Qwest provided VoIP service, voice traffic from any telephone system at the customer premises is packetized and sent to the network through an IP router. The voice traffic passes through session border controllers (SBCs). The SBCs in the Qwest network allows the traffic to move into an environment with access to feature, media and route management servers. These elements are the enablers of a rich VoIP service and provide the functionality necessary to route from a VoIP environment to a time division multiplexing (TDM) environment or VoIP endpoint. Calls can be originated or terminate at the peer networks. In addition, session initiation protocol (SIP) trunking will allow IP PBXs to interface to this network, as well. All of the elements in the Qwest-routed data network enable customers to run voice as one of many services available on a broadband pipe. With this configuration, customers gain access to feature and media servers and hosted and integrated access VoIP capabilities. They can also manage the main features and services at an administrative or user level, which enhances the customer experience.

Q. Looking to the future, how will Qwest continue to meet the needs of its large enterprise customers?

A. Qwest is at the forefront of technology investigation and we're setting standards around how technology should work. It's our mission to make sure we have the right technologies, scale and price points to meet the demands of our customers. In addition to providing security and reliability, we need to employ state-of-the-art technologies to make sure our solutions are cost-effective to our customers, as well.

WHY QWEST

Qwest delivers reliable, scalable data and voice networking solutions, across one of the largest U.S. fiber footprints. Qwest serves businesses of all sizes, ranging from small business to 95 percent of Fortune 500 companies, with industry-leading SLAs and world-class customer service.

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