VoIP VPN:
The low-cost, low-risk
migration path
to convergence
Introduction

Enterprises want to increase customer loyalty and revenues by using their networks to deliver improved, proactive customer service. As a result, enterprises need to support an increasing number of converged applications that create competitive differentiation for their companies – while keeping operating and capital expenses down. Voice over IP (VoIP) is widely accepted as the one of the most important technologies to converge enterprise communications.
By adopting VoIP virtual private networks (VPNs), enterprises can set up company-wide VoIP-based communications without the need for point-to-point connections between facilities. As a result, enterprises can achieve increased flexibility and decrease their operating expenses substantially. Unlike traditional separate meshed voice and data networks, each site requires only a single converged access link to a service provider's VPN-enabled network. All network services, including local, long distance, Internet and intranets, are delivered over this link. Consequently, enterprises save on leased line charges, dial plan management charges and long-distance costs. VoIP VPN is also cost effective: an enterprise can see return on investment (ROI) within a year of deploying it.

In addition to substantially decreased operating expenses, VoIP VPN also lays the foundation for applications that create competitive differentiation for enterprises that adopt it. VoIP VPN provides the basis for innovative applications that integrate voice, data and video – such as unified messaging, collaboration and mobility services. Enterprises can become more anticipatory by taking advantage of new services, like multimedia contact centers and integrated voice response, that enable employees to anticipate customers’ needs and increase customer satisfaction. Employees can use these applications to work more efficiently and productively. As a result, corporate profitability – and customer loyalty – improves.

**Today's business reality: Engaging customers, controlling costs**

Today's enterprises face constant pressure to improve the customer experience; the enterprise network has become the platform to deliver that experience. The new network has to help anticipate customer needs, support seamless collaboration and enable exceptional levels of personalized service. To maximize productivity and profitability and to ensure long-term customer relationships, enterprises need the ability to provide the same level of service wherever an employee is working, or from wherever a customer calls. By eliminating traditional carrier-enterprise network boundaries, enterprises can move more quickly and meet customer needs more precisely.

Complicating matters, enterprises are also under pressure to support an increasing number of business applications while lowering operating and capital expenses. So CIOs are looking at ways to maximize their network performance across the enterprise network. Virtually every enterprise business has committed to evolving its communications network to a converged model; most are now figuring out how to move forward.

Enterprises want to mitigate the risk of new technology becoming obsolete. They are also working hard to contain their operating costs. For large, multisite enterprises like these, Voice over IP (VoIP) virtual private networks (VPNs) offer a viable way of converging corporate communications, unifying corporate sites and enabling a more engaged approach to customer service.

**What is VoIP VPN?**

**VPNs, voice and VoIP: Putting it all together**

A virtual private network (VPN) refers to a private network run over a shared public infrastructure. Both voice and data VPNs have existed for many years. For the purposes of this discussion, a voice VPN is defined as a voice service offered by an interexchange carrier, such as AT&T, MCI or Sprint. Enterprises make voice VPN calls using a Time Division Multiplex (TDM) Prime Rate Interface (PRI). A voice VPN call is routed back to the carrier – who manages the enterprise's dial plan – where it is then forwarded to its target destination.

†Based on a Nortel Networks business case.
The concept of running voice over an IP-based VPN is relatively new. A Voice over IP (or VoIP) VPN enables an enterprise to run its private voice network over the public IP network. VoIP VPNs let enterprises interconnect private voice sites — typically PBXs, IP PBXs, Centrex or Centrex IP — over a shared, quality-of-service (QoS)-enabled IP infrastructure, allowing them to cost-effectively converge their voice, data and video traffic onto a single backbone.

Typically, VoIP VPNs are delivered over a service provider's IP network as a managed service. Enterprises can implement their own voice VPNs over carrier IP networks. However, they cannot fully consolidate local and long-distance calling the way a service provider can.

Voice features, such as corporate dialing plans, are delivered from a softswitch located in the carrier's network. The VoIP VPN provider can deliver local voice as well as a complete range of data services, such as Internet access, IP VPNs, secure sockets layer (SSL) VPNs and other services, all over the same converged access link — in addition to intersite and long-distance voice.

Ultimately, VoIP VPNs deliver all of the benefits of traditional voice VPNs, including centralized dial plan management and long-distance savings, along with the cost benefit of IP VPNs. The softswitch at the carrier site provides centralized routing and dial plan management.

**VoIP VPN versus traditional voice networking**

Compared to the traditional, “meshed” model of enterprise networking, VoIP VPN offers many advantages.

In the current model, an enterprise typically requires a multitude of access links at each site from a multitude of providers in order to deliver the complete range of services enterprise users need. Every time the enterprise adds a new office, it needs to provision leased lines from that site to a data provider (and potentially a long-distance provider), order local voice services, and complete the translations and routing tables in the new site's PBX, as well as all other sites in the network, to reflect the enterprise's private dial plan. As the network grows,
the complexity, cost and time required to make network changes grows as well. Consequently, enterprise networks are complex, inefficient and costly to manage.

By contrast, an enterprise simplifies its network significantly when it uses VoIP VPN. Rather than relying on a mesh of links, each site requires only one converged access link. All network services are delivered over this link: local, long-distance, Internet and intranet. The enterprise not only saves on leased line charges, but on reduced dial plan management charges and long-distance costs as well. Additionally, the enterprise saves on the cost of adding, moving or removing a site, because the network changes don’t affect other sites. All the enterprise requires is a single link for the site to access the VoIP VPN provider. The provider delivers all required services and looks after the enterprise’s dial plan changes in its softswitch. The result is a network that is much simpler, more efficient and more cost effective.

**VoIP VPN convergence benefits**

**Reduced costs**
Cost savings is the primary benefit of VoIP VPN-based convergence. VoIP VPN reduces the cost and the time required to make network changes, and also lowers the cost and complexity associated with the migration to VoIP. VoIP VPN networks use the IP protocol and access links based on site size and platform availability. Typical access technologies include Gigabit Ethernet, SONET/SDH, xDSL, ATM or Frame Relay.

In addition to leased line savings, enterprises also benefit from reductions in dial plan management and long-distance costs. By working with its service provider, the enterprise can negotiate a complete and consistent service bundle, including off-net VoIP calling, Voice over IP QoS management and other hosted data services.

VoIP VPN also lets enterprises take advantage of private network features such as abbreviated dialing and remote access. These features enable more seamless communications between branches and mobile workers, ensuring better customer service across the entire organization. Enterprises can now provide the same advanced communication services to all their employees anytime, anywhere, and give employees more control of their communications – helping them increase productivity.

**The business case for VoIP VPN**
The following business case quantifies the benefits of VoIP VPN to an enterprise. The model is based on a present-mode-of-operation (PMO) versus future-mode-of-operation (FMO) analysis. The analysis is based on a Nortel Networks business case.

In the example above, the PMO is based on the ongoing operational costs, including PBX management, leased line and long-distance charges for a private network consisting of 21 sites. The enterprise consists of a head office with 5,000 employees, 4 satellite offices and 16 branch offices. In the PMO network, a total of 68 leased lines are required for intracompany voice and long-distance. This case assumes that data access facilities are already in place.
The FMO covers all of the same costs for this network, but running over a VoIP VPN. The FMO also includes all of the costs required to upgrade the existing network to VoIP, including router upgrades and data access for additional bandwidth and QoS, plus adding VoIP gateway cards to IP-enabled PBXs. VoIP “virtual ports” are charged at flat rate for intracompany calls, which use both voice compression and silence suppression. No voice compression or silence suppression is used for long-distance calls.

The highlights: in-year payback for IP-enabling an existing TDM voice infrastructure, an annual operational savings of $543,000 per year effectively covers all of the up-front costs in the first year. The return on investment is 108% and the five-year Net Present Value is $1.4 million. The FMO savings are a result of lower dial plan management costs, leased line elimination and long-distance savings.

**Increased productivity**

Using VoIP VPN, enterprises can revolutionize how employees work together and interact with customers. VoIP VPN provides the basis for innovative applications that integrate voice, data and video – such as unified messaging, collaboration and mobility services. Employees can use these applications to work more efficiently and productively. As a result, corporate profitability improves.

**New engaged applications**

Enterprises can become more anticipatory by taking advantage of new services, like multimedia contact centers and integrated voice response, that enable employees to anticipate customers’ needs and increase customer satisfaction. More satisfied customers mean more repeat business, resulting in greater profitability.

**The Nortel Networks VoIP VPN solution**

For enterprises that want to enhance their VoIP VPN, Nortel Networks offers Succession 3.0 – a software-based, enterprise IP call server. Succession 3.0 delivers a breadth of new telephony and multimedia applications over a converged IP infrastructure, eliminating unnecessary network duplication and offering enterprises a number of options designed to address their unique communication and business needs. Because it’s a standards-based solution, it interoperates with other PBXs as well, enabling cross-vendor networking.

Succession 3.0 delivers additional benefits to complement a VoIP VPN, including:

- Seamless integration of various IP telephony elements into a larger IP telephony network using H.323 (IP peer phase 2 / virtual trunking)
- Improved voice quality across hybrid IP/TDM networks with trunk optimization call modification (TRO-CM)
- Cost-effective deployment of head office features to branches and smaller locations, thanks to Succession branch office
- Transparency of network voice services such as network ACD, network message services and network attendant services
- Improved quality of service (QoS) within the IP telephony network using troubleshooting enhancements
- Increased productivity using enterprise-wide Web-based business applications, delivered by the Net6™ Transformation Gateway.

For Nortel Networks installed-base customers, Succession 3.0 also supports MCDN, the signaling system used across Nortel Networks enterprise IP portfolio – including Norstar, BCM, Meridian 1, Succession 1000 and Succession 5100 –
to maintain feature transparency seamlessly across the network. Succession 3.0 offers choices for migrating to IP telephony without disruption, allowing an enterprise to evolve at its own pace, preserving its legacy investment.

Outsourcing VoIP VPN from a certified Nortel Networks service provider offers even more benefits.

**Conclusion**

As enterprises look to their networks to deliver improved, proactive customer service, VoIP VPN is emerging as the ideal topology to converge corporate communications. It lays the foundation for applications that create competitive differentiation for their companies – while keeping operating and capital expenses down. VoIP VPN has the ability to converge corporate communications without the need for point-to-point connections between facilities, thereby delivering increased flexibility and substantially decreased operating expenses. The savings are a result of leased line elimination, dial plan management costs and reduced long-distance charges. In addition, administration costs can also be significantly reduced by receiving a complete and consistent service bundle from a single service provider including off-net VoIP calling, Voice over IP QoS management and other data services. Finally, productivity increases from flexible remote and access and mobility have the potential to enhance savings.

**The Nortel Networks advantage**

The Nortel Networks VoIP VPN solution reflects a powerful strategy dedicated to helping enterprises eliminate barriers and evolve into Engaged Businesses. Nortel Networks has used its expertise in the carrier and enterprise voice markets to develop a low-cost, low-risk migration path to VoIP.

Nortel Networks has the breadth and depth of portfolios across both carrier and enterprise networks to deliver a truly end-to-end VoIP VPN network offering. We are focused on eliminating the boundaries between voice and data, wireline and wireless, and public and private networks. Eliminating these boundaries will improve our customers’ profitability and competitive advantage by enabling them to provide their employees with easy access to personalized communications that are secure, robust, adaptable and available anytime from anywhere.
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Nortel Networks is an industry leader and innovator focused on transforming how the world communicates and exchanges information. The company is supplying its service provider and enterprise customers with communications technology and infrastructure to enable value-added IP data, voice and multimedia services spanning Wireless Networks, Wireline Networks, Enterprise Networks and Optical Networks. As a global company, Nortel Networks does business in more than 150 countries. More information about Nortel Networks can be found on the Web at:

www.nortelnetworks.com

For more information, contact your Nortel Networks representative, or call 1-800-4NORTEL or 1-800-466-7835 from anywhere in North America.

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