



# WHITE PAPER

## How Quintum's Access Solutions Bring Service Providers and Enterprises Together to Make the World Safe for VoIP

### Executive Summary

Voice-over-IP (VoIP) offers a wide range of benefits - including cost savings, the convenience of managing one network instead of two, simplified provisioning of services to remote locations, and the ability to deploy a new generation of converged applications. However, implementation of VoIP poses a variety of challenges for enterprises and service providers alike.

For service providers, these challenges include the tremendous diversity in the customer environments. These environments range from legacy PBXs to state-of-the-art all-IP infrastructure. To profitably deliver VoIP in this diverse market, service providers must be able to quickly and inexpensively accommodate whatever type of equipment exists on a customer's premises. Service providers must also be able to ensure their customers that the VoIP solutions they deliver are reliable and secure. And they have to be able to remotely manage their customers' on-premise equipment, even if it's behind a firewall running network address translation (NAT).

For enterprise IT managers, the challenges are similar. Corporate VoIP implementers need to be sure that their environments can interface seamlessly with their chosen service provider. They need to know that their voice communications will be 100% reliable. They need their solution to be secure and easily manageable. And they, too, need to keep their total infrastructure costs as low as possible.

The good news is that both service providers and enterprises have generally done a good job of addressing these challenges within their own net

work environments. The bad news is that the interface between their respective networks remains problematic. It is at the edge of these two networks that compatibility, survivability, manageability, security and cost become obstacles to successful VoIP implementation.

In fact, the future of convergence is largely contingent upon solving the problem of VoIP access at the edge. If service providers and enterprises continue to struggle to connect their networks to each other - and if they find the network-to-network interface overly difficult to manage - then the majority of enterprises will never reap the benefits of convergence, and service providers will never realize the full profit potential of VoIP. If, on the other hand, life on the edge can somehow be made easier and safer, the convergence market will experience explosive growth and rapidly move upmarket.

Quintum's intelligent Tenor VoIP access switching solutions uniquely address the challenges posed by life on the edge. They provide the universal interoperability with premises equipment that is essential for fast, pain-free VoIP access. They deliver the survivability and QoS mechanisms essential to ensure five-9s reliability for packetized voice services. And they give service providers and enterprise IT teams alike the management capabilities they need to simplify both installation and ongoing VoIP ownership.

VoIP should and will become the dominant modality for voice in the future across all markets. But that future belongs exclusively to those who can master life at the edge.

## ISSUES AT THE EDGE:

### *Where the service provider network meets the enterprise*

Service providers and their business customers are both eager to reap the benefits of VoIP and convergence. Service providers want to capture new customers, reduce operational costs and deliver new revenue- and profit-driving offerings - such as IP Centrex and presence-enabled conferencing. Business customers are seeking reduced costs, simplified management, and the ability to implement those new service provider offerings.

Despite these common interests, however, service providers and their customers have not been able to move forward with their convergence plans as quickly as either of them would like. That's because they face a variety of nagging issues as they try to interface their networks. These issues include:

#### **Compatibility and ease of installation**

Service providers typically maintain highly standardized environments in order to keep operating costs low and optimize economies of scale. Their customers, on the other hand, have an extremely diverse range of equipment and configurations. This creates a fundamental conflict. Service providers can't afford to perform a lot of highly customized "one-off" installations. They want to have a simple, uniform way to connect their customers' networks to their own. Business customers, on the other hand, want their service provider to fully support their entire existing environments - whether they

include traditional PBXs, IP PBXs, and/or analog devices such as fax machines or facilities management systems that use built-in modems to provide centralized monitoring capabilities.

In other words, service providers need the network-to-network interface to be very easy to deploy. But, because of the diversity of the enterprise environments they have to plug into, they historically have not been able to achieve this goal.

#### **Survivability/reliability**

Business users depend on voice service every minute of the day. So they are reasonably reticent about moving forward with any solution that doesn't promise rock-solid reliability. Service providers want to fulfill this requirement, because they know that reliable service is essential for customer retention and strong brand identity. The problem is that the interface between their respective networks potentially represents a single point-of-failure. This creates both a real risk of service interruption and a heightened perception of potential risk. Both service providers and business customers need a way to mitigate or even eliminate this risk factor.

#### **Manageability and security**

Both service providers and their business customers have other challenges beyond simply transporting voice packets from one end-point to the other. They also have to be able to keep their network environments safe and secure. They thus need visibility into and control over remote devices, regardless of where they're situ-

ated. This sometimes sounds simpler than it is in the real world. For example, many businesses employ network address translation (NAT) technology on their firewalls in order to mask their internal IP infrastructure from malicious intruders. Unfortunately, NAT implementations typically also make the enterprise network opaque to external VoIP management - hampering the ability of service providers to support convergence. Service providers also have to address scalability when it comes to management, since they may have to support thousands of premises devices.

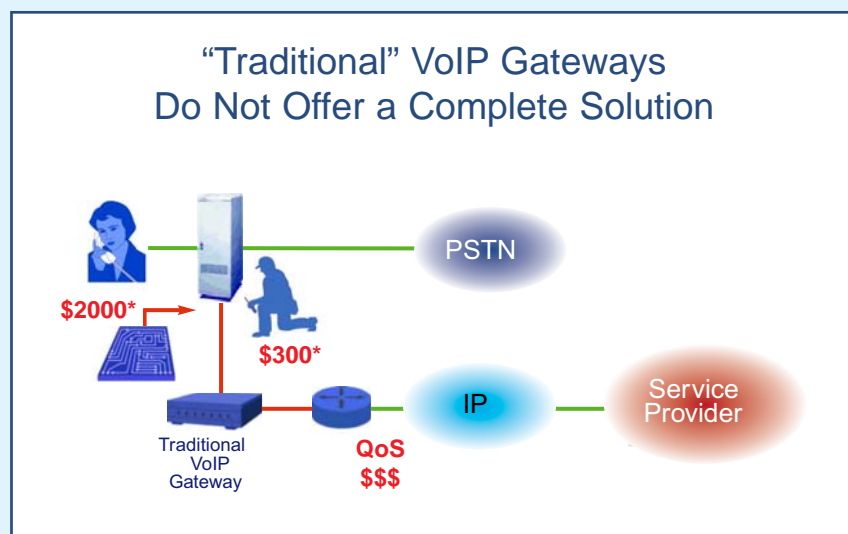
**Cost**

Service providers and business customers obviously both want to keep the cost of interfacing their networks as low as possible - especially if the business has multiple locations. This has been difficult to do, because of the price and number of devices that have historically been

required to ensure a manageable VoIP environment. Between modifications to the PBX, the purchase and installation of a VoIP gateway, and the implementation of other devices such as SIP controllers, the cost of provisioning VoIP connectivity can run to several thousand dollars. The upfront costs are not acceptable in today's market and represent a significant inhibitor to VoIP adoption.

With all these obstacles, it's no wonder that service providers have not been signing up business customers at a faster rate - and that VoIP hasn't quickly become the market standard for voice communications. Convergence certainly offers enough potential benefits to drive more widespread adoption. But the price and risk of conversion are too high for service providers and their customers alike. So, for the market to move forward, an alternative approach is clearly required.

*Historically, business customers have had to shoulder significant costs and hassles to connect their networks to VoIP services - while having to also tolerate risk and potential loss of analog functionality.*



## Quintum's solutions for the edge

As one of the industry's leading developers of VoIP switching and gateway solutions, Quintum Technologies has uniquely focused on the issues surrounding the connection of enterprise voice infrastructure to service provider networks. The result of this focus is a switching architecture ideally suited for both the realities facing both enterprise network managers seeking a reliable platform for voice/data convergence and service provider engineering teams seeking to profitably deliver dependable VoIP access.

### **Adaptable, zero-hassle implementation**

Quintum's Tenor VoIP switches and gateways are designed to fit into virtually any enterprise environment, installing easily between the PBX and the IP network. They interoperate with and are fully transparent to all types of traditional and IP-based PBXs - thus eliminating the need for PBX reconfiguration. Voice traffic leaving the PBX is directed to the appropriate "path" (i.e. the service provider's network, the enterprise WAN and/or the PSTN) based on easily programmed rules.

Because Quintum switches don't require modification of the PBX, they support whatever dial plan is already in place. They also support analog fax machines, conventional paging systems, and other types of existing infrastructure. So, in addition to requiring minimal work on the part of technicians, Quintum's switching solutions also ensure that the transition to VoIP doesn't disrupt the business or require users to change their entrenched work habits.

The ability to use a common set of easily installed hardware solutions across all customer sites has obvious benefits to service providers - including lower equipment costs, reduced provisioning costs, and fewer opportunities for installation error. At the same time, the non-intrusive nature of Quintum's switching technology enables enterprise buyers to avoid counter-productive disruptions as they take their first steps towards convergence - whatever those first steps may be.

### **Unmatched protection of voice quality and availability**

No enterprise can afford to lose its ability to make and receive phone calls for even a short amount of time. And no service provider wants a paying customer to experience such a loss of service. Unfortunately, problems can and do occur in real-world IP networks - which is why service interruptions are a major concern for both enterprises and service providers.

Quintum has uniquely addressed this issue in several important ways. First, Quintum switches provide a local SIP proxy agent that allows IP phones in remote offices to continue functioning even if their connection to a central IP PBX is lost. This ensures the survivability of voice service in the event of a problem on the IP network.

The presence of a local SIP proxy agent (along with the built-in intelligence provided by Tenor switches) is especially important for service

providers offering hosted IP PBX implementations and/or IP Centrex services - since it keeps customers' phones alive with basic telephony capabilities and allows calls to continue to be routed to both IP addresses and over the PSTN.

Second, Quintum switches continually monitor conditions on the IP connections and can immediately detect when congestion or an outage threatens call quality. When that happens, calls can automatically be re-directed over the PSTN until appropriate service levels are restored on the IP network. This failover is so quick and transparent that even active calls can be recovered without interrupting ongoing phone conversations.

Quintum switches even protect voice services from themselves. If a switch loses power, the switch simply passes voice traffic through to its PSTN connection. So users can continue making calls even in the event of a catastrophic failure.

#### **Ease of ownership**

Quintum ensures ease, scalability and security of management through the use of a Remote Management Session Server (RMSS) that sits between managed devices and a central management console. Each of these servers can register up to 5,000 devices and manage up to 100 Tenors simultaneously.

Because managed devices are registered with the RMSS, it can set up management sessions across firewalls running network address translation (NAT). Historically, such firewalls have made remote management of VoIP devices prob-

lematic, because of the way they conceal IP addresses. The RMSS also encrypts management session traffic, bringing a critically important added level of security to the VoIP environment.

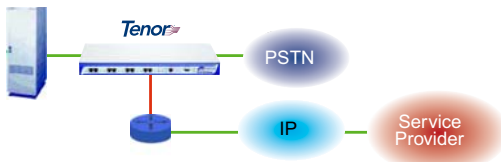
Tenors can be managed via telnet, FTP or Quintum's own graphical Tenor Configuration Manager. This gives enterprise and service provider management teams alike the flexibility to integrate VoIP management into their overall network ownership operations.

#### **Reduced costs**

By eliminating both the hardware and the labor costs associated with PBX reconfiguration, Quintum's solutions significantly reduce the capital outlay required to make enterprise networks VoIP-ready to interface them with service provider access. Quintum's broad product range also eliminates wasteful spending by ensuring a close fit between the requirements of any site - from the largest corporate headquarters to the smallest remote office - and the cost of the device installed there. These savings can be especially substantial for organizations with large numbers of offices, retail locations, or other facilities.

Quintum switches offer many other attractive features and capabilities - such as highly efficient multiplexing of VoIP packets for reduced bandwidth utilization, support for both H.323 and SIP, and simple implementation of "hop-on" and "hop-off" calling. All of these features are designed to maximize returns on VoIP infrastructure investments and make life easier for technical staffs.

## Quintum's VoIP Solutions are the "Perfect Fit"



MultiPath architecture allows the Tenor to be transparently "dropped in" between the PBX and the PSTN, so it is both easy to deploy and can intelligently route calls over the network that will assure the best combination of voice quality and cost-effectiveness.

In fact, no other vendor provides a more robust and cost-efficient solution for linking existing corporate voice environments to private or public IP networks. In terms of simplicity, reliability, ease of ownership and cost, Quintum's survivable switching platform offers the optimal solution for both the enterprise and VoIP service providers.

### The benefits of a better edge

Because of their unique suitability for the edge, Quintum's VoIP switching solutions offer both enterprises and service providers significant benefits.

### For service providers, these benefits include:

- Easier, less costly installation on customer premises
- Faster time-to-delivery for new sites
- Fewer technical problems and truck rolls for initial provisioning

- More reliable service, resulting in higher customer satisfaction
- Easier monitoring and maintenance
- More efficient use of technical staff resources

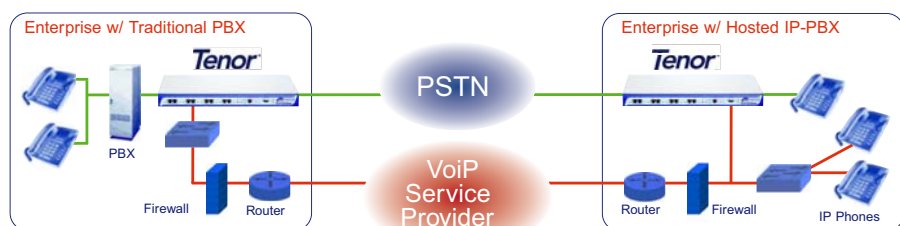
### For enterprises, these benefits include:

- Less expensive and time-consuming VoIP implementation
- Optimum reliability of voice service
- No disruption of users' entrenched calling habits and no re-training
- Maximum flexibility in VoIP implementation
- Minimum disruption to existing network infrastructure
- Preservation of investments in analog equipment

Just as important as the benefits Quintum switches offer each of these constituencies is the fact that Quintum solutions offer significant benefits to both. Enterprise customers and their service providers no longer have to struggle with conflicting interests and priorities as they determine what kind of equipment to install as they seek to provision next-generation VoIP services. Instead, Quintum's platform delivers a win-win solution that effectively addresses both of their needs. This common suitability for customer and vendor alike decisively differentiates Quintum from the rest of the market and makes its switches a perfect fit for the enterprise-service provider edge.

## Quintum Offers the Most Complete Solution for Enterprise CPE

Tenor's MultiPath architecture allows Service Providers to easily deploy Tenors on the edge to integrate legacy equipment, providing connectivity to the local telephone networks, while assuring reliable, survivable and hassle-free VoIP service to their customers.



## About Quintum

Headquartered in Eatontown, NJ, Quintum delivers VoIP solutions that bring the reliability and voice clarity of public telephone networks to Internet telephony. Quintum's intelligent VoIP access solutions integrate easily into existing PBX and IP infrastructures, making them the ideal choice for service providers and enterprise alike.

According to InStat/MDR, Quintum has the second-largest marketshare in the low density VoIP market. The company was picked by Forbes for its "Top Ten To Watch in 2005" list of top privately-held technology companies and was ranked number 205 on the INC. 500 list of fastest growing private companies. Quintum is also a Nortel Developer Partner and an Avaya DevConnect Partner.

---

*Quintum sells its switches worldwide through its direct sales force and a network of resellers and distributors. For more information, call 1-877-SPEAK IP (1-877-773-2547), 1-732-460-9000 outside the US, or visit us online at [www.quintum.com](http://www.quintum.com).*