



**SELECTING A VoIP SOLUTION**  
**@ THE ENTERPRISE EDGE**

## Comparing alternatives for enterprise VoIP and VoIP access.

### EXECUTIVE SUMMARY

The selection of an enterprise VoIP solution is a major decision. Voice service is critical to the operation of the business, so no one wants to implement a technology that will compromise call quality or reliability in any way. On the other hand, the cost savings and value-added functionality available with VoIP makes it a compelling investment. So VoIP buyers must select a VoIP platform that maximizes business benefits while minimizing potential technology ownership headaches.

Adding to the difficulty in making a purchase decision is the broad range of vendor offerings on the market. In general, these offerings can be segmented into two categories: low-end VoIP gateways and high-end router-based solutions.

Low-end gateways are tempting because of their low upfront cost. However, they lack many important capabilities that are essential for VoIP to work as required in real-world network environments and to fulfill the requirements of the business. Their poor survivability, lack of intelligent call routing functions and inadequate integration with existing enterprise communications resources limit their usefulness and can lead to problems in provisioning VoIP services as required.

High-end router-based products come with a larger price tag and, at first glance, offer more sophisticated VoIP functionality. Unfortunately, they often come with further price premiums in the form of PBX modification and add-on modules for support of H.323 and/or SIP. And, despite their price and apparent robustness, their capabilities may still come up short in many ways - forcing users to change their dialing habits, limiting the efficiency with which available bandwidth can be used, and exhibiting the same lack of survivability as their low-end counterparts.

Quintum's VoIP solutions, on the other hand, offer buyers a fully optimized alternative to either of these groups. Thanks to Quintum's unique MultiPath architecture, Tenor switches install easily into existing enterprise environments. They offer survivability that neither gateways nor router-based products can match. They deliver much more robust functionality and more efficient use of WAN bandwidth than low-end gateways. They also outperform router-based products with greater ease-of-use, more efficient bandwidth utilization, seamless PSTN failover, and more - even though they are less expensive to buy, install and own.

So, ultimately, the decision about which VoIP platform to select is actually an easy one. Quintum's superior functionality and superior value make it the optimal choice for enterprise buyers seeking to reap the full benefits of VoIP without putting voice service at risk, taking on big implementation headaches, or spending more than they have to. These same advantages also make Quintum's Tenor switches ideal for service providers seeking an easy-to-install, easy-to-integrate customer premises solution.

## **PITFALLS ON THE LOW END**

Low-end gateways can be very attractive to today's VoIP buyer. Most IT organizations are working with very tight budgets. And many do not have highly ambitious plans for their initial VoIP deployments. They simply want to piggyback voice calls on their data network's existing IP connections. So it's easy for them to be seduced into purchasing a simple, no-frills VoIP gateway to ostensibly limit costs and complexity.

This is rarely a wise decision. Low-end gateways are rarely adequate for today's enterprise VoIP requirements. Even in cases where they may be able to meet an immediate, short-term need, they will not be able to support evolving technical and business requirements in the future.

Specific common shortcomings in low-end gateways include:

### **Poor interoperability with the PBX**

Low-end gateways simply convert analog signals from a phone line to a stream of packets that can travel over an IP link. They are therefore unable to interoperate with or leverage the power of the corporate PBX. This can make installation in the existing enterprise communications environment problematic. Users may be required change their dialing habits - something most are disinclined to do. So any cost savings can quickly be consumed by installation and configuration work.

### **Lack of enterprise-class capabilities**

Low-end gateways are limited-use devices with little or no call routing capability. They are mainly intended for "second line" applications that supplement a separate regular phone line. Thus, they typically route all calls to a central point where the intelligence resides. As a result, they cannot support basic VoIP functions such as network "hop off" or "hop on" that allow, for example, the transatlantic portion of a call from an office in the U.S. to a customer in France to be carried over a corporate WAN connection to an office in Paris before being passed to a local phone company - thereby eliminating international phone charges. Reliance on a central point-of-intelligence also leaves these gateways completely vulnerable to a failure of that central point.

### **NAT headaches**

Many organizations use network address translation (NAT) on their routers and/or firewalls as a security measure and as a way of increasing the number of IP addresses available for their internal use. But, because NAT masks internal addresses from the outside world, it can also make it difficult or impossible to set up point-to-point VoIP sessions with external users. Low-end gateways that lack an effective mechanism for automatically and securely traversing these NAT boundaries can therefore cause significant implementation headaches.

### **No H.323 and/or SIP Survivability**

H.323 and SIP protocols are becoming increasingly useful for interfacing with other network and other organizations - especially next-generation service providers that can deliver tremendous savings on long distance. Because they lack support for these protocols, low-end gateways force customers to purchase separate H.323 gatekeepers and/or SIP proxy servers. The cost of these additional devices nullifies

whatever savings were realized in the original gateway purchase. Worse yet, reliance on these external devices leaves all the gateways on the network vulnerable to their single point-of-failure. If they lose contact with the central H.323 gatekeeper or SIP proxy server, phone service can be totally disrupted.

### **Lack of support for 911 services and analog devices**

While much of the world is going digital, telecom managers still have to support analog communications for local 911 emergency services, fax machines and other reasons. A low-end VoIP gateway cannot accommodate these analog requirements.

### **Vulnerability to IP network congestion and/or failure**

Low-end gateways do not protect the business against problems on the data network. If the IP network becomes congested or fails, the calls that it carries will lose quality or fail. That's because such gateways can't automatically re-route calls over alternative routes or over the PSTN itself. This risk is unacceptable in an enterprise environment.

### **Inefficient utilization of network bandwidth**

Because of their price-sensitivity, VoIP gateways typically lack or have only rudimentary compression/multiplexing capabilities. This makes them relatively inefficient and can cause them to lose call quality as call volume rises - or as other applications on the network begin to consume more of the bandwidth available on key network

These are just a few of the technical pitfalls associated with low-end VoIP gateways. For IT organizations seeking to minimize technology headaches, ensure ongoing call quality, and maximize the business value of their investments in VoIP, these pitfalls clearly give pause. Prospective buyers can ill afford to purchase products that will have to be replaced in a year or six months. And they can't allow the business to be hindered by unnecessary limitations in its communications infrastructure.

## **PITFALLS ON THE HIGH END**

In order to ensure that VoIP services are robust, reliable and secure, technology buyers may go to the opposite extreme - spending top dollar to acquire high-end router-based solutions from a big-name networking vendor. There is certainly some apparent safety in this approach, and such high-end solutions do boast capabilities well beyond those of low-cost, off-brand gateways.

However, despite their expense and the cachet of their brand, these router-based solutions also fall short of the mark in many ways. As a result, VoIP buyers can wind up spending a lot of money and still not getting the functionality or even the reliability they require.

Specific shortcomings of high-end router-based solutions include:

### **Complex, disruptive implementation**

Router-based VoIP solutions typically require the use of a separate line trunk on the PBX. This adds the significant cost of an additional line card. It also requires re-programming of the PBX so that VoIP calls are routed to that trunk. In addition, this approach can force users to dial one prefix for PSTN calls and another for VoIP. These solutions can thus cause significant headaches for technical staff and end-users.

### **Limited failover capabilities**

Because these high-end solutions are on a separate trunk, they do not have the PSTN connectivity necessary for effective failover. They can be equipped with a simple analog line for back-up purposes, but they are by and large unable to automatically switch to that line. So, in the event of problems on the IP network, all active calls will be dropped and will have to be manually re-dialed over the PSTN.

### **No H.323 and/or SIP Survivability**

High-end router solutions also share a basic shortcoming with low-end gateways: they require customers to purchase separate H.323 gatekeepers and/or SIP proxy servers. However, in the case of router-based solutions, these add-ons can be even more expensive. These shared add-on devices also cause the same type of potential single point-of-failure in router-based architectures as occur with basic VoIP gateways.

### **No multiplexing**

Router vendors typically attempt to address the issue of bandwidth utilization with packet header compression alone. However, as use of VoIP expands and the other application traffic on the network continues to grow, compression alone will be insufficient to meet many organizations' needs. Multiplexing delivers far more efficient use of available bandwidth, yet router-based solutions don't provide it despite their cost and purported sophistication.

### **Vendor lock-in**

Many router vendors' VoIP solutions are closely tied to their overall data networking architectures. This may offer some limited benefits in terms of network management, but those benefits may be entirely contingent on using that single vendor's solutions across the enterprise. This lock-in strategy by the vendors limits IT's future choices and assures the vendor of an ongoing, across-the-board pricing premium.

Higher costs do not always mean great functionality or superior adaptability to an organization's specific needs. VoIP buyers should therefore consider all of the implementation and ownership costs associated with router-based products - including difficult implementation, poor survivability, and additional user training and support - and then determine if those significantly greater lifecycle costs are truly buying any technical, operational or business advantages.

## THE QUINTUM ADVANTAGE

Quintum's Tenor MultiPath Switching solutions offer a significantly superior alternative to both low-end gateways and high-end router-based products. Its unique architecture and features deliver far greater value than competing solutions at either end of the cost spectrum. And, because of its unique failover capabilities, it is also the most reliable and dependable VoIP platform on the market today.

Key attributes that make Quintum's Tenor switches such a compelling value include:

### **Painless deployment in existing PBX and IP environments**

Rather than requiring an additional line card, Tenor MultiPath switches can be installed almost effortlessly between the PBX, a premises router and the PSTN. No modification to either the PBX or the IP network is required (assuming that conditions on the IP network are conducive to good VoIP quality). This greatly reduces implementation cost and accelerates time-to-benefit. It also eliminates the need to re-train users and rely on them to use appropriate dialing prefixes.

### **Enterprise-class call routing intelligence**

The built-in call routing intelligence of the Tenor switching platform makes it ideal for a full range of enterprise applications. Tenor switches are easily programmed to flexibly fulfill virtually any call routing parameters. Calls can be automatically routed over the enterprise IP network, over service provider IP networks, or over the PSTN based on their destination - without requiring users to dial the right prefix. This enables companies to take full advantage of low-cost international VoIP services, hop-on/hop-off calling, and other cost-saving strategies. Quintum's technology even allows calls to be dynamically routed over different networks based on changing conditions including performance and cost.

### **H.323 and SIP support for true survivability**

Tenor switches provide complete support for H.323 and SIP without requiring the use of additional hardware. This reduces cost, simplifies implementation and - most importantly - eliminates a potential point-of-failure. This support allows the Tenor's capabilities to be fully leveraged in conjunction with other H.323 and SIP-compliant applications. In fact, select Tenor models boast full H.323 gatekeeper functionality, which allows them to operate independently without any loss of functionality.

### **Automatic PSTN failover**

Quintum's Tenor switching platform possesses the unique ability to automatically and transparently re-route calls from the data network to the PSTN if conditions on the data network threaten call quality in any way. This failover capability, dubbed SelectNet™, executes so quickly that callers do not even realize it has taken place. This capability is absolutely critical for organizations that want to enjoy all the benefits of VoIP but can't afford to put essential voice services at risk.

### **Highly efficient call multiplexing**

To boost the efficiency with which calls are routed over the IP network, Tenor switches can multiplex calls traveling across the same link. This patented PacketSaver™ technology conserves significantly more bandwidth than mere header compression. In fact, any voice traffic that Tenor switches multiplex can also be compressed by network routers - creating even greater bandwidth-efficiency.

### **Easy NAT traversal**

Tenor switches effectively manage the signaling sequence during call set-up to ensure that NAT-enabled firewalls and/or routers do not interfere with VoIP service. They do this without bogging network managers down in complex device and software configuration. This NATAccess™ feature is especially important for supporting small office/home offices sites that now almost invariably use NAT-enabled "mini-routers" to perform firewall functions as well - since these offices typically do not have expert technicians on-site.

### **Analog device support**

Companies implementing VoIP must often still support a wide range of analog devices at all of their locations - including fax machines and intercoms. Emergency 911 services also require the availability of an analog line. Tenor switches can be configured to provide this analog connectivity, making them far more suitable for most real-world business environments than competing low-end or high-end offerings.

### **No vendor lock-in**

Because Quintum's Tenor switches can simply be "dropped into" virtually any vendor's telecom and/or data networking environment, it does not lock buyers into any particular platform or hardware brand. They function just as well on network with a mix of equipment from different vendors as they do in single-vendor environments. With the communications landscape continuing to change at a rapid pace, this flexibility to migrate, upgrade and enhance the rest of the enterprise environment is vitally important.

There are many other aspects of Quintum's Tenor switching platform that buyers find appealing as well: its ease-of-use, the breadth of available configurations, its support for international PSTN protocols, etc. The feature list above, however, highlights those capabilities that most notably distinguish the Tenor platform from competing products at either end of the cost-and-complexity spectrum. These features make Quintum's Tenor switches the clear choice for real-world implementations where interoperability, adaptability and economical lifetime cost-of-ownership are key considerations. Technology decision-makers should therefore strongly consider Quintum's distinctive total value proposition when evaluating available VoIP solutions.

These same attributes make Quintum's Tenor switches a highly compelling customer premises solution for VoIP service providers. Because Tenor switches can be easily installed into virtually any customer environment, they reduce the cost of field operations and accelerate service activation. Their survivability and failover capabilities ensure customers of continuous, reliable service. In short, they allow service providers to satisfy their own technical requirements and those of their customers at a price-point that make sense in today's highly competitive market.

## About Quintum Technologies

Headquartered in Eatontown, NJ, Quintum specializes in voice-over-IP technologies that bring reliability and voice clarity of public telephone networks to Internet telephony. Its Tenor VoIP MultiPath switch product lines are designed to help businesses of all sizes achieve a risk free migration to a converged network. Quintum's Tenor product line offers a wide range of unique features that differentiate it from other VoIP solutions. These features include real time PSTN failover that eliminates risk from poor IP Quality of Service, MultiPath call routing allowing easy installation into existing data and telecom environments, and transparent communication across NAT (network address translation) firewalls. Quintum Technologies sells its MultiPath 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), 732-460-9000 outside the US, or visit [www.quintum.com](http://www.quintum.com).



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