

**Premises to Keep:**  
**CPE as a Critical Success**  
**Factor for VoIP Service**  
**Providers**



White Paper by  
Quintum Technologies

## Premises to Keep:

# CPE as a Critical Success Factor for VoIP Service Providers

In the early stages of VoIP implementation, the central concern for service providers was ensuring that their IP-based networks could reliably deliver acceptable end-to-end call quality. This issue has largely been resolved. As a result, VoIP is now an attractive alternative to conventional analog voice and the PSTN.

As the VoIP market continues to evolve, however, service providers face a new set of challenges. It's no longer enough to simply meet customers' expectations regarding call quality. Service providers must also:

- drive down costs
- ensure the scalability necessary to support business growth
- fulfill customer expectations in terms of performance and functionality
- differentiate themselves from the competition

A service provider's choice of customer premises equipment (CPE) plays a critical role in addressing these multiple challenges. Differences in CPE features and functionality can have a major impact on a wide range of issues that are of significant concern to VoIP customers – including survivability, support for existing analog devices, and PSTN connectivity. CPE characteristics can also have a substantial impact on installation and support costs. The selection of the right CPE is thus a crucial success factor for VoIP service providers.

This white paper outlines several important criteria to consider when selecting a VoIP CPE solution. By applying these criteria, VoIP service providers can better satisfy market demands, gain competitive advantages, and achieve higher operating margins.

## Executive Summary

### Success Factors in the VoIP Market

The VoIP services market is estimated at over \$4 Billion in North America alone, estimated to grow at a 60% compound annual growth rate through 2012. Competition for this market is intense, and margins can be slim. To profitably grow under these conditions, service providers must be able to simultaneously:

- 1) give customers compelling reasons to choose their particular VoIP offering, and
- 2) optimize the economic performance of their own network operations.

Several factors give customers compelling reasons to choose one service provider's VoIP offering over another:

#### The call quality factor

Customers have generally demonstrated an unwillingness to trade away call quality in order to gain cost savings or other feature-function benefits. They are also highly inclined to change service providers if they encounter problems with the voice quality of their calls. Service providers must therefore ensure that end-to-end call quality consistently remains within customers' tolerances.

#### The survivability factor

Voice service is absolutely critical to every business. Customers have no tolerance whatsoever for interruptions in their voice service. Service providers must therefore ensure that customers can continue to make and receive phone calls under all types of network conditions.

There are actually two types of conditions that can threaten the availability of voice services. One is the catastrophic failure of, or extreme congestion within, the service provider's VoIP "cloud." The other is the failure of or disconnection with a central call management resource, such as an IP PBX, Unified Communications (UC) failure of, or disconnection with, server or service provider's softswitch.

Because the former condition has been fairly well addressed by service providers in recent years, it is the latter condition that is typically more problematic. There are actually several points-of-failure outside of the service provider's control that can readily cause remote offices to lose access to a central PBX or UC server – especially if it is located at the customer's own headquarters. The server itself may fail. A LAN device at either the headquarters or remote location may fail. There may also be a failure on the WAN connection (which may or may not be under the service provider's control) between the two locations.

Unless some other provision is made for survivability, any of these conditions will result in the loss of VoIP calling capabilities in the remote office.

#### **The analog support factor**

Customers can have a variety of devices that are not designed to plug into an IP network. First and foremost among these is typically the analog fax machine. While many companies have adopted digital fax machines and/or the use of scan-and-attach email solutions to transmit hard-copy documents, the analog fax machine remains a staple of business communication. It is thus essential that any VoIP implementation plan accommodate this entrenched day-to-day business tool.

Customers often have many other devices that depend on the availability of an analog network connection, as well. These can include postage meters, security systems, and environment control systems that use built-in modems to communicate with a central command console and/or an outside monitoring service. Customers may also have analog intercom and/or PA systems that have to interface with their employees' desk phones.

These analog devices are actually more common in remote offices than in corporate headquarters. Companies that centralize their facilities management operations, for example, will use such devices to monitor conditions in remote offices – even though no such devices are used at their headquarters. Similarly, warehouses and manufacturing plants that use intercoms are typically remote, rather than co-located with headquarters.

Customers may not even be fully aware of their own dependence on these analog devices – and may even blame their service provider for not apprising them of the unforeseen consequences that result from their transition to VoIP. Service providers must therefore be able to support these devices whether or not such support is included in the customer's original functional specifications.

#### **The PSTN connectivity factor**

Even customers that fully re-tool for a complete transition to VoIP may still need analog PSTN connectivity to the outside world. This connectivity may be required for access to 911 emergency services, for a local presence to receive inbound calls, and for allowing outbound local calls. In some cases, it may also be appropriate as a failover measure in the event of a WAN failure.

#### **The adaptability factor**

Customer environments vary greatly. Service providers therefore need to be able to accommodate all types of sites – from the smallest to the largest, from the most homogeneous to the most diverse – regardless of specifics such as Session Initiation Protocol (SIP) implementations or the presence of messaging platforms such as Microsoft® Unified Communications (UC). This "any-to-any" adaptability isn't just important for initial implementations. It's also essential for continuing to meet customers' needs as their communications environments evolve, as they add additional remote sites, and as they merge with and/or acquire other companies.

**The responsive service factor**

Customers want what they want when they want it. If they sign on the dotted line, they expect their VoIP service provider to be able to get them up and running quickly – and they expect provisioning to be done right the first time. They also expect their service provider to be able to pro-actively detect and resolve any infrastructure issues that could potentially disrupt voice service at any and all remote locations.

**The ease-of-use factor**

Customers have a long history of experience acquiring technologies that wind up being more of a hassle to own than they're worth. Service providers must therefore exercise diligence in ensuring that they don't saddle customers with technology that creates excessive additional work or skill challenges.

**The price factor**

The actual cost of VoIP is a non-trivial factor in every customer's initial purchasing decision – as well as any subsequent decision they may make to change service providers. Service providers must therefore be diligent about keeping costs low enough to maintain competitive pricing.

**Several factors contribute to the economic performance of a service provider's network operations:****The installation factor**

Service providers have to keep the cost and complexity of installing and configuring VoIP service at new sites to a minimum. If it requires too much time and skill to get a new site up and running, costs will go up – as will the risks of error and delayed activation. None of these eventualities are likely to improve the customer experience or customer satisfaction. And they definitely won't help profits.

**The scalability factor**

As service providers sign on more customers and have to support a greater number of remote sites, scalability will have a great impact on bottom-line business performance. All network operations have to be streamlined in order to control overhead and ensure responsive customer service. Any failure to take pro-active measures that improve the scalability of operations will result in significant logistical problems and poor financial performance.

**The infrastructure TCO factor**

To maximize profits, service providers have to keep both capital equipment costs and ongoing infrastructure management costs under control. Strategies for TCO control typically include selecting cost-effective hardware solutions, buying solutions that bundle all required functionality (rather than having to purchase "add-on" capabilities), and consolidating purchases to maximize vendor discounts.

**Quintum CPE solutions**

Quintum Technologies has been fulfilling the needs of VoIP service providers worldwide for the past 8 years. Over that time, Quintum has risen to become the second-leading provider of standalone VoIP gateways and customer premises equipment (CPE) solutions for business, according to Frost & Sullivan (2007). That's because Quintum has remained highly responsive to the evolving needs of service providers as both technical and business requirements have changed over time.

Quintum's latest generation of CPE solutions are specifically designed to address the eleven success factors described in the preceding section.

### **Call quality**

Quintum's CPE solutions protect call quality in several ways. They multiplex voice packets from multiple calls over the IP network and apply highly efficient compression technologies to significantly reduce bandwidth consumption. This helps safeguard call quality even in very low-bandwidth environments (such as those found outside the United States) by mitigating the impact of contention.

Quintum's solutions also incorporate high performance echo cancellation algorithms that safeguard call quality in regions with problematic PSTN environments, such as China.

In addition, Quintum's solutions allow voice traffic to be transparently re-routed to either alternative IP connections or the PSTN in the event that the primary network connection fails.

Quintum CPE solutions thus fulfill service providers' call-quality requirements as well as or better than any other available CPE alternative.

### **Survivability**

Quintum CPE solutions safeguard voice service availability in several ways. First, their combination of an embedded SIP proxy and auto-discovery ensures that essential calling capabilities will remain functional in customers' remote office even if the connection to a central or hosted IP PBX or UC server is lost – as well as in the event the PBX or UC server itself malfunctions. Because the CPE does auto-discovery of phones (including their phone numbers and authentication) at the remote office, its SIP proxy can provide sufficient routing intelligence to maintain dial-tone to the desktop and support basic calling capabilities.

Just as important, this auto-discovery means that the CPE doesn't have to be updated every time there is a change at the remote site. It automatically maintains its own survivability without requiring intervention by a technician.

Quintum's PSTN failover feature also provides protection against the loss of essential voice services in the event of a network failure.

Quintum solutions thus enable service providers to deliver more reliable VoIP service than CPE devices that lack auto-discovery or embedded proxies. This reliability is also achieved without the costs associated with the purchase, installation, and ongoing maintenance of separate SIP servers at each remote location.

### **Analog support**

Quintum CPE can be readily configured to provide as many analog ports as required to support customers' "legacy" communications devices – including fax machines, non-IP phones, and the various types of modem-enabled systems in common use today for remote monitoring of HVAC equipment, security systems, etc. By efficiently packetizing analog signals, Quintum solutions enable service providers to fulfill customers' communication needs across all remote locations.

### **PSTN connectivity**

In addition to providing an "on-ramp" onto the IP network for analog devices, Quintum CPE solutions provide an "off-ramp" for packetized voice onto the PSTN. This also allows calls to be made and received via the local loop. Plus, as noted above, this PSTN connectivity provides a ready failover capability in the event of IP network problems.

Most importantly, analog PSTN connectivity ensures the ability of all users at remote locations to communicate with local 911 emergency services. Quintum CPE solutions thus ensure that customers will be able to keep their people and facilities safe even as they pursue the advantages of VoIP.

### **Responsive service**

Quintum CPE can be remotely managed via telnet, FTP or Quintum's own graphical Tenor Management Console. The Tenor Management Console provides the complete system configuration, performance monitoring, diagnostics, troubleshooting, and remote upgrade functionality needed to maintain and optimize VoIP service levels.

Quintum also offers a Remote Management Session Server (RMSS) that enables service providers to securely access all of their distributed CPE devices even if they are located behind customers' NAT firewalls. All communications between the RMSS and remote CPE are encrypted to ensure network security. And each CPE device can be registered with two separate RMSS Application Servers to provide redundancy. All the remote management capabilities of the Tenor are available through a secure 'management' tunnel.

#### **Ease of use**

Quintum solutions don't require nearly the same amount of care and attention from customers or service providers as the typical IP PBX vendor's remote office server. Once Quintum CPE devices are configured, they pass signaling through to the central IP PBX and are therefore transparent to IP end-points – so new phones can be installed by simply pointing them at the CPE. This eliminates a primary source of aggravation on the customer's side.

#### **Fast, simple installation**

Quintum CPE solutions quickly and effortlessly “drop in” to customer environments. They are transparent to the customer's PBX and IP network infrastructure – so they don't require modification of existing local infrastructure. They can also be set up to automatically identify themselves to a provisioning server in the service provider's network operations center (NOC), allowing them to acquire their own IP address and configuration settings directly from a central provisioning system. This automated, non-disruptive installation allows service providers to bring new remote sites up quickly without costly truck rolls.

#### **Adaptability**

Quintum CPE solutions can connect a full range of customer environments – including those with traditional PBXs, IP PBXs, and Unified Communications – to a full range of service provider environments, including circuit-switched networks and SIP-based digital architectures. Quintum's SIP proxy technology is even able to connect the kinds of disparate SIP implementations that often create headaches for provisioning teams.

In addition to providing this “any-to-any” connectivity, Quintum solutions are available in a full range of port sizes and configurations – so service providers can implement a single, coherent set of CPE devices across all customer sites.

#### **Scalability**

By simplifying installation and management, conserving network bandwidth, and providing a single CPE platform for all customer sites, Quintum CPE solutions enable service providers to economically scale their installed base higher than any other VoIP product line.

#### **High value, low TCO**

Quintum CPE solutions provide a complete set of essential functionality – including survivability, analog support, PSTN connectivity, and “any-to-any” connectivity – in a single, self-contained package. This single-device solution offers service providers significantly greater value than alternative solutions. With Quintum CPE, on the other hand, the cost of hardware, provisioning, and ongoing management are all substantially reduced. This cost savings can be passed along to the customer without impacting profit margins.

Simply put, Quintum CPE solutions fulfill the technical and business requirements of both service providers and their diverse customers more effectively and cost-efficiently than any other set of devices available from any other single vendor.

## **Serious benefits for VoIP service providers**

A service provider's choice of CPE means more than the saving of a few pennies on hardware. In fact, the right CPE choice can fundamentally impact a service provider's ability to compete and optimize operating margins.

With its breadth of functionality and market-driven design, Quintum's complete line of VoIP CPE solutions can have a particularly powerful impact on a service provider's bottom-line business performance. Key benefits that can result from use of Quintum solutions include:

#### **Greater customer satisfaction and retention**

It doesn't matter how many customers a service provider signs up on the front end if they end up leaving out the back. Retention of existing accounts is always more profitable than the acquisition of new ones. Service providers who use Quintum CPE to maintain VoIP availability, speed responsiveness to service requests, and support all existing analog communications requirements will out-perform those who don't.

#### **Lower equipment and installation costs**

Complex, expensive customer premises configurations that require deployment of multiple devices and/or the implementation of hardware and software from different vendors will invariably result in higher up-front costs. As a complete, self-contained solution that drops easily into customer environments, Quintum CPE minimizes these up-front costs – allowing service providers to pass savings along to the customer in the form of more attractive pricing, as well as increase their operating margins.

#### **Lower operating costs**

In addition to lowering the cost of initiating service, Quintum CPE lowers lifetime operating costs by easing troubleshooting and upgrades, eliminating the need for manual re-configuration of CPE when other elements in the customer's environment change, and by conserving bandwidth allowing investments in network infrastructure upgrades to be deferred. These cost savings enable service providers to price their VoIP offerings more competitively, while maintaining healthier margins.

#### **Competitive differentiation**

VoIP service providers can find it difficult to differentiate themselves based on call quality. Differentiation on price alone isn't good for profits. With Quintum CPE, on the other hand, service providers can point to a variety of capabilities – non-disruptive installation, analog support, survivability, etc. – to win new business. They can also commit to supporting customers' long-term roadmaps for the evolution of their converged data, voice, and unified messaging environments. These differentiators can help win new business and prevent competitors from poaching existing accounts.

#### **Ability to grow revenue and profits**

Service provider success depends to a large degree on the ability to not only grow, but also to realize substantial economies of scale as that growth continues. Quintum CPE solutions ensure the realization of these economies of scale by simplifying deployment, eliminating truck rolls, and enabling standardization of CPE across even the largest and most diverse customer bases.

VoIP offers customers many advantages – including significant telecom cost savings, the efficiency of managing one network instead of two, and the ability to deploy a new generation of converged applications. These advantages and others are likely to drive an expanding market for service providers for several years.

But competition for this market will remain intense, and price pressures will become increasingly problematic. To grow and thrive under these conditions, VoIP service providers need to leverage every advantage available. Quintum CPE solutions clearly deliver such advantages. By partnering with Quintum, service providers can enhance their ability to win business and sustain profits over the long term. They can also build their overall brand by delivering a superior customer experience at a better price.

## About Quintum

Quintum, a wholly owned subsidiary of NET, is 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 enterprises alike.

According to In-Stat, 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 Microsoft Gold Certified Partner, a Nortel Developer Partner and an Avaya DeveloperConnection 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 <http://www.quintum.com>.

Network Equipment Technologies, Inc. (NET), headquartered in Fremont, CA, provides voice and data communications equipment for multi-service networks requiring high degrees of versatility, interoperability, security and performance. For more information, visit <http://www.net.com>.