

Quintum Technologies Overview

Quintum Technologies, Inc., an innovator in the VoIP arena, has introduced many new Voice over Internet Protocol (VoIP) concepts and patented technologies based on its flagship product: the award-winning Tenor MultiPath Switch.

Quintum brings "active intelligence" into voice connectivity, eliminating the barriers for convergence of today's networks and the applications they will support in the future. Through Quintum's unique approach, we have developed breakthrough technology that vastly improves Quality of Service, Ease of Use and Ease of Integration for VoIP, and provides the foundation to address future enterprise voice/data issues.

Bottom Line, Quintum's products allow organizations to save money by combining their Voice and Data Networks. In addition, they allow Next Generation Telephone Companies and Internet Service Providers the opportunity to expand their services and sources of revenue.

The Tenors do this by converting voice and fax calls into data packets, and routing them over the IP network, using available bandwidth on Corporate WAN's or the Public Internet. In addition, the Tenor's integrated VoIP Gatekeeper functionality allows a dynamic directory system to be in place, so that the VoIP network can change and grow with no downtime.

Analog and Digital Tenors



As mentioned before, Quintum's flagship products, the Analog and Digital Tenors are flexible & scalable in their design. The **Digital Tenor** is available with options to support 8, 16, 24 or 30 simultaneous VoIP channels (calls) and is installed in between a Private Branch Exchange (PBX) and the Public Switched Telephone Network (PSTN) via T1, E1 or PRI lines, and then connected into an Ethernet Switch as simply as adding a new PC to the network. For smaller and branch locations, it supports fractional T1, E1 and PRI. Multiple Tenors may be "stacked together" in one location.

The **Analog Tenor** supports either 4 or 8 simultaneous voice calls, and installs in the same manner as the Digital Tenor, but is connected to Analog (Loop Start) Telephone Lines. There is also a new 2-port version, called the **Tenor A200**, featured below, as it has a different feature set than the rest of the Tenor family.

Another newer product is the **Tenor CMS** (Carrier MultiPath Switch), which is a Carrier-Class, Chassis-Based High Density Switch, which can support up to 960 simultaneous phone calls. This product is quickly becoming a staple of the Next Generation Phone Companies and Calling Card Phone Operators.



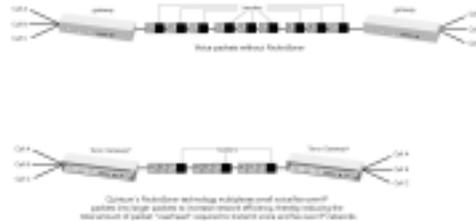
Here is a quick look at some of the supporting technologies that run through Quintum's Product Line:

SelectNet™ Technology

This patented technology allows VoIP calls to remain connected, even if the IP network is having problems or fails. Without the callers intervention or knowledge, the Tenors can be configured to switch a call from the IP Network to the PSTN when certain criteria is met regarding 3 factors; IP Packet Loss, Delay (Latency) and Jitter.

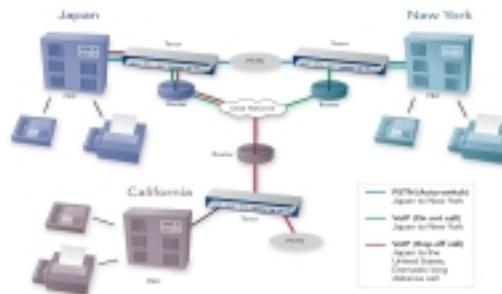
PacketSaver™ Technology

PacketSaver saves bandwidth, and bandwidth can be an expensive. By configuring the Tenors with PacketSaver, many (up to 30) IP phone calls share the same IP Packet Header (which is the largest chunk of a VoIP call). By combining PacketSaver and other integrated technologies, you can reduce the amount of IP Bandwidth used by over 50%! At 100% capacity on an E1 trunk, that means using 192Kbps instead of 397Kbps (Kilobits per second). (This is not yet available in the 2-port Analog Tenor)



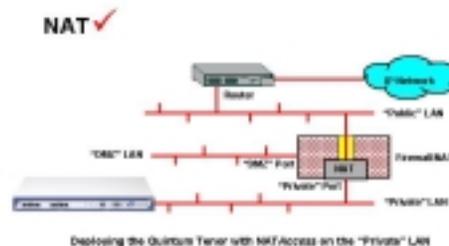
Transparent MultiPath™ call routing

Besides the traditional “pass through” calls (from PBX to PSTN and vice versa) and bi-directional IP Calls, calls can travel over the IP Network and “Hop Off” into a distant PSTN or “Hop On” to the IP network from the PSTN, facilitating pre-paid calling card-type applications.



NATAccess™

The unique feature allows any Tenor (not including the A200) to be assigned both a Public and a Private IP address. This is critically important to allow IP phone calls to be able to survive Firewalls and NAT (Network Address Translation) Servers. The alternative is to have the VoIP Gateway outside the firewall or to “open up” certain parts of the firewall, and Network Administrators do not do this happily or willingly. NATAccess™ provides VoIP phone calls the intelligence they require to “go around” the Firewall and/or NAT Server without compromising the integrity of the IP network. (This is not yet available in the 2-port Analog Tenor)



Integrated H.323 Gateway, Gatekeeper & Border Element

Most other VoIP Gateways are only equipped to turn voice signal into IP Packets and start the call setup process. Quintum's Tenors don't stop there. Integrated within every Tenor (except the Tenor A200) is the ability to run Gatekeeper and Border Element processes. The Gatekeeper's function is to match together Phone Numbers on your network with the coinciding IP addresses of where each Phone Number terminates. The Border Element's function is to communicate with each Gatekeeper and to furnish updates of the matching Phone Numbers & IP Addresses to all of other Gatekeepers dynamically as changes are made.



<http://www.quintum.com>

IVR and RADIUS Connectivity

To be a phone service provider, you need to be able to identify your customers, validate their PIN codes and calling card numbers, and either send your customers a monthly bill for services provided (post-paid), or deduct funds from their Calling Cards (pre-paid). Quintum's IVR (Interactive Voice Response) and RADIUS (Remote Authentication Dial-In User Services) connections make it all happen. The RADIUS Server (which is a 3rd party solution) transmits and receives Authentication and Accounting messages to and from the Tenor. The Tenor then plays voice files served from an IVR server, as needed, to prompt the customers as to what information is needed from them during their call (e.g. Calling Card Number, Destination Number) or to provide the customer information about their account (e.g. How much time/money is remaining on this card).

Tenor A200

The Tenor A200 was designed with the SOHO (Small Office/Home Office) Market in mind. It flaunts an integrated and full-featured Data Router, Ethernet Switch and Firewall/NAT Server. Just plug the A200 into any DSL modem, Cable modem or IP Network, and you have VoIP capabilities and the ability to have multiple PC's share one IP connection! Since the A200 is geared for this particular market, it does not have (or require) all of the above-mentioned Quintum Technologies, but it does provide a high-quality solution at a great price.

Risk Free VoIP

Unlike Quintum's competitors, all Tenors are compatible with any brand of PBX, and with many other VoIP Software Clients, Gateways and Gatekeepers. Combine that interoperability with SelectNet, which guarantees that your phone calls do not fail, and you have "Risk Free VoIP!"