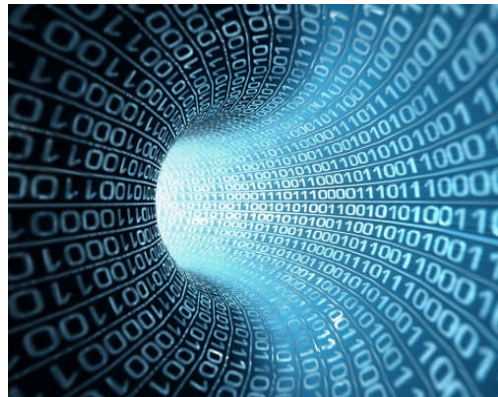




VectorX™: A VoIP Quality of Service & Security Solution from BandTel (rev 110719b)

One of the big **economic advantages** VoIP has over standard circuit based telephony is **you can merge your voice and data traffic together** over the same IP connection.

That offers big savings, as internet pipes for the most part are poorly utilized most of the time. So by filling them with VoIP traffic significantly improves cost efficiencies.



But to successfully do that merger you must engineer a quality of Service (QoS) mechanism that ...

- **Allows VoIP traffic to have precedence over corporate bulk IP traffic**
- **Acts in a passive manner by not interfering with the corporate IP firewall.**

If you ignore addressing QoS you may very well find, even with plenty of bandwidth, that your VoIP service is unusable; i.e. poor quality resulting from packet drops and delays.

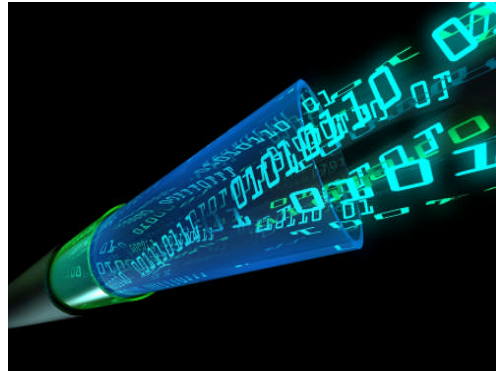
Internet providers make their margin by providing their customers with no more bandwidth than they are absolutely contracted to. So the moment you exceed your allocation the ISP throttles your traffic back, and starts dropping and delaying packets.

For non real-time applications that run over TCP-IP that's not a big issue. The protocol simply retransmits. But for VoIP over UDP-IP it's disastrous. You can't retransmit a piece of someone's conversation! It must be a real-time service, all the time.

VectorX™ : The QoS Solution

BandTel solves this QoS dilemma by inserting VectorX™ , a packet policy enforcement system, between the ISP and your corporate firewall.

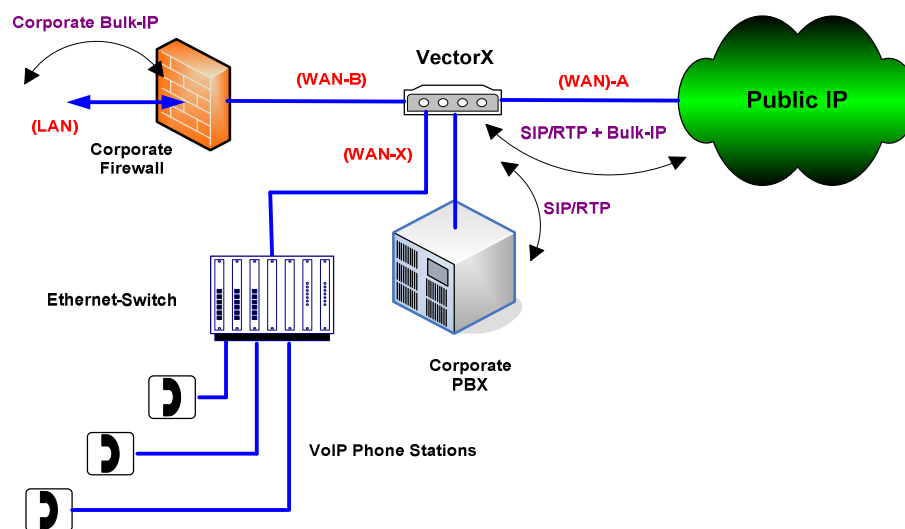
Since VectorX™ operates at IP layer-2 in bridging mode your corporate firewall is unaware of the device, and so requires no changes to support it and VoIP.



On the telephone side VectorX™ supports three forms of corporate PBX trunk side connections:

- **Analog-** FXS- 4 to X analog ports are supported with Vector-Ax
- **PCM-** 23/24 to X ports are supported via T1/E1/Pri interfaces to your PBX with Vector-T
- **IP Direct-** 4 to X SIP-Trunks are supported direct to your IP-PBX with Vector-Ix

The diagram below illustrates Vector-X installed in a typical arrangement:



- **ISP WAN demark** connects to WAN-A of VectorX™
- **Enterprise firewall** connects to WAN-B of VectorX™
- **Analog Ports, T1 Ports, or direct IP/SIP port** comes out of the third connection (WAN-X), and terminates into the corporate PBX

VectorX™ : The QoS Solution (cont.)

This arrangement totally removes and separates the VoIP traffic from enterprise bulk IP traffic.

This results in total VoIP quality of service with the voice and bulk data running together over the same physical IP drop to/from your ISP.



VectorX™ : The Security Solution

VectorX™ is also a fully functional firewall in its own right. and so allows BandTel to offer full VoIP security to your account.

Attempts to hack and steal from your VoIP account will be virtually impossible with VectorX™ deployed inline on your service.

Save on Bandwidth With VectorX

To accurately compare prices between BandTel and other vendors the last mile IP pipe must be considered. Specifically, if there is no last mile VoIP QoS solution provided by the competing VoIP vendor then a dedicated IP circuit must be provisioned to realize quality of service.

The spread sheet below shows the impact on cost for a small office wishing to deploy VoIP with BandTel vs. a vendor offering no QoS solution.

<u>BandTel VectorX Cost Comparison</u>		
	BandTel	Competitor
Given:		
Minutes Dialed	15000	15000
Price Per minute	\$0.024	\$0.024
Dedicatied IP VoIP Pipe	\$0	\$150
Calc:		
Actual Price/Min	\$0.024	\$0.034
Actual Price/Mo	\$360	\$510
Summary		
BandTel Savings	42%	
Notes:	*1- with VectorX deployed a dedicated IP pipe for VoIP is not needed *2- unless a QoS solution is offed a dedicated IP pipe for VoIP would be needed	

The BandTel Advantage

Your corporate PBX running VoIP services with BandTel is one of the best PBX/Carrier combinations you can make.

- **Competitive Pricing** - BandTel prices are competitive, and are coupled with the NPlus™ VoIP architecture; a technology that goes far beyond what the rest of the industry is offering today.
- **Plug & Play** - If you want your PBX "to just work" with VoIP choose BandTel. We understand how to implement VoIP at the customer premise PBX. Your installation with us will be a "Plug & Play" experience.
- **99.999% Reliable** - We can make that claim because BandTel's [NPlus™](#) architect allows us to. BandTel offers a level of redundant uptime service for your PBX that your PSTN carrier could never be able to match.
- **Security** - We have the technical expertise and programs in place to guarantee that your PBX using VoIP with BandTel will be secure. We audit your system during installation, and then continue to make sure it's secure as you continue the service with us.

So Contact the BandTel Sales Team Today and Learn How To...

- **Save on telecommunications costs for your corporate PBX (savings as high as 40%+ are possible).**
- **Advance and Modernize enterprise telecommunications services to your corporate PBX**
- **Be Safe and secure all at the same time with your VoIP enabled corporate PBX**

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