

IP Telephony – Finally Ready for Prime Time?

In its earliest form, what we now know as IP telephony was called VoIP (Voice over Internet Protocol). VoIP was heralded in the mid 1990's as a must-have technology to dramatically reduce the cost of business calls between branch offices by sending IP voice traffic over the existing corporate data network. Additional savings from reduced support costs, lower costs for wiring and simplified administration were also presented as justification for a widespread implementation of VoIP. Companies installed IP gateways and rationalized the cost of the investment against the savings that would be realized over traditional long distance services. However, when reviewing the real costs and the limited functionality of VoIP, most early adopters abandoned the technology as it did not provide net savings, it offered limited features and it was handicapped by QOS and reliability issues¹.

Today, many of the network management issues have been resolved. More and more vendors are offering robust VoIP solutions and some of the major telecom manufacturers are providing excellent migration paths to IP-enable existing key² and PBX² systems. Perhaps most important though is that there is a growing suite of practical business applications that leverage IP voice technology. In short, the business case for IP in specific applications is too strong to ignore.

The media coverage of recent CRTC VoIP regulatory issues has raised public awareness of VoIP. Much of this discussion has centred on new telecom providers and their plans to use VoIP to provide local line and long distance services. With these new regulatory changes, hydro companies, cable companies and a host of other new competitors are positioning themselves to lure customers from the traditional telephone service providers. This recent media attention makes it even more important for this paper to differentiate **VoIP** from **IP Telephony** ... they are related technologies, but their application is very different.

VoIP is the basic technology that provides point-to-point packetized voice transmission over an IP network. It is the technology that carriers use to deliver calls across Canada or around the world for a fraction of 1990's rates. The VoIP user interface (the "phone") may involve a PC and microphone, a headset, a standard analog telephone set, a trunk port on a telephone system or even a generic H.323 type device. Regardless of the method of connection, the VoIP call is simply that, a call, without additional information or applications travelling along with it.

IPTel on the other hand is a much more strategic implementation of VoIP. IPTel is not just a matter of converting analog voice to IP packets and transmitting across a data network, although that is part of the process. IPTel leverages the rich feature set and flexibility of a

¹ Adapted from "Getting ready for Convergence" NEC Unified Solutions Whitepaper, July 2004

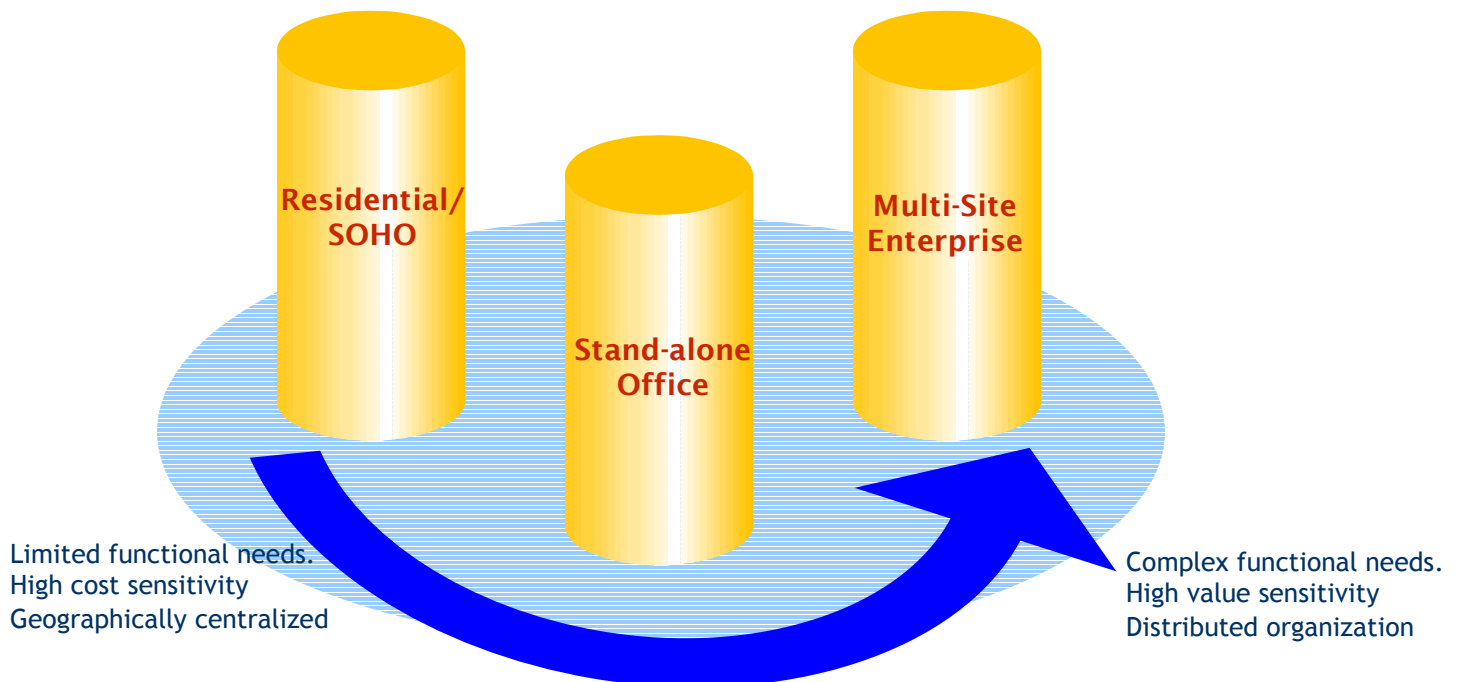
² A **key** system has traditionally been defined as a system for one office location, usually smaller sites with up to 50 users. Over time, key systems have developed comprehensive feature packages but have retained their focus on the one or two office market. Some of these systems such as the Nortel's BCM, NEC's Elite IPK and Avaya's Merlin also offer IP capabilities as well. A **PBX** system has traditionally addressed larger site requirements ranging from 40 phones to thousands of users. Most importantly, these PBX systems have supported sophisticated networking to link multiple sites together and include Nortel's Meridian/C1000, NEC's NEAX product family and Avaya's Definity.

business phone system and extends its reach across a LAN or WAN. IP telephony handles the call set-up messages and the networking information, transparent to the end user, that make possible the convenience and ease-of-use offered by networked telephony systems. Thus teleworkers, office workers at a branch office or call centre agents anywhere in the network can benefit from the features and functions of the PBX – enterprise call routing, voice mail, telephone set displays, message lights, voice call to name a few -- as though they physically present at the central site¹.

A few paragraphs ago, I used the phrase “*IP in specific applications*”. IP is a tool to help solve challenges presented by different groups in the organization, but it is not the only tool at the IT manager’s disposal. Legacy equipment still offers a very reliable, feature-rich platform that exceeds the needs of most company staff and does so inexpensively. However, there are specific, practical applications where IPTel has real, quantifiable advantages. It is these areas that I will focus on in this short paper.

The Business Environment

Telecom VAR’s experienced in deploying traditional telephony as well as hybrid IP solutions have discovered that there are three sets of IP applications that are grouped based on the size of the customer organization. These silos include; Small office/home office, Stand-alone and Enterprise. Each category has its own set of feature and cost requirements but generally, the viability of an IPTel deployment increases in relation to the size of the organization or the complexity of the customer need.



SOHO – The small office/home office (SOHO) application has functional needs that are well served by simple VoIP offerings. These needs might include;

- Local phone service (local number, dial tone, call display, call forwarding)
- Low-cost long distance calling
- Voice mailbox. With messages delivered via dial-in or via web interface
- Remote location presence – local number provided for remote markets
- Toll free services

New vendors such as Primus, Vonage, Sprint, Packet8 as well as traditional telephone and cable providers are offering residential and SOHO VoIP services to meet these needs. Most of these services allow the user to continue to use their existing residential-type single line phone in conjunction with a VoIP DSL router that connects to the provider's local point-of-presence (POP).

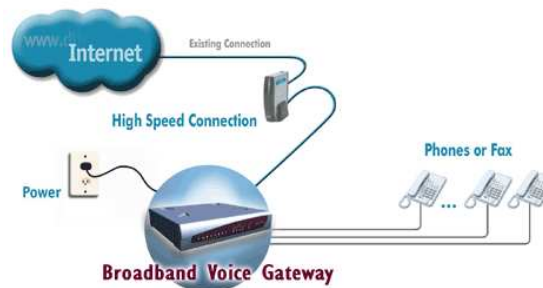


Figure 2.

Illustration source: Primus Canada, www.primus.ca

These services are suitable for SOHO and residential applications but often lack the set of features, and reliability demanded by commercial applications.

IP Centrex: Positioned slightly above VoIP in terms of functionality is an updated version of traditional Centrex services. Various providers are offering IP Centrex as a managed telephone service where a virtual PBX is located on a managed network and clients access the service via managed or unmanaged connections. Single line sets, proprietary sets and SoftPhones are available to connect clients to the virtual PBX.

On the surface, IP Centrex looks attractive, as there is little up-front capital investment. The service provider looks after management of the system as well as software upgrades. On closer inspection though, traditional Centrex or the newer IP variant end being an expensive solution once messaging, call routing, call centre and other important applications are included. IP Centrex solution providers charge a monthly fee for the basic service plus voicemail options plus a quality DSL connection. These charges can often be more than double the cost of installing an IP-enabled telephone system and connecting local line services.

From this point on, we see a greater penetration of IPTel rather than simple VoIP when describing telecom capabilities. The next two scenarios are based on customer-owned or leased platforms that provide traditional telecom applications or, where required, also incorporate advanced IP telephony

Stand-Alone: For the purposes of this discussion I'll consider the "Stand-alone" silo to include one main site and up to one other satellite location. This "stand-alone" scenario can take many forms including;

- Single office with small, medium or large user community
- Main office with remote workers or regional sales staff;
- A car dealership with a main facility with sales, service and administration in one location and a used car sales facility a few blocks away;

In this scenario the company requirement for IP Telephony is often created by the following factors;

- Calls answered at the main office need to be transferred to staff, regardless of their physical location. If the employee is unable to answer the call, alternate routing and backup answering is identical to that of an onsite employee.
- Frequent calling/call transfers between staff members
- Calls made by remote staff need to display the company caller ID rather than a remote site or even a home office number.
- Centralized messaging – 1 voice messaging system handles routing and messaging for all staff regardless of their location
- Mobile or regional sales staff use Contact Management or CRM software to stay in contact with prospects and customers. IPTel applications allow the call to be placed and tracked entirely from a SoftPhone-equipped PC.
- Mobile workers within the office
- Transient staff need to login to business hotelling workstations
- Work group collaboration

Unlike a VoIP offering, this IPTel configuration extends the full capabilities of the office phone system, including;

- Line access
- Voice page
- Voice messaging
- Call centre agent
- Transfer
- Caller ID
- Telephone set display messages
- Wireless 802.11 mobility

...to all users, regardless of their physical location. In addition, IP SoftPhone users have access to new capabilities such as CRM integration, videoconference, call recording, call logging and Short Text Messaging.

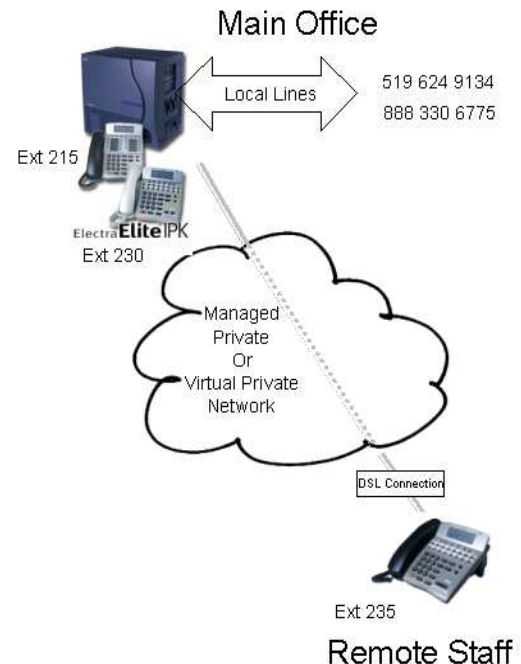


Figure 3

Enterprise/ Multi Branch

The enterprise configuration was once the domain of large corporate networks ... connecting major office locations together via dedicated, voice-only digital lines. Thankfully, converged voice and data IP networks as well as much more scalable IP-PBX systems have made this multi-site topology affordable for companies with much smaller physical requirements. This scalability is a real benefit to the SME as it is here where the real power and versatility of IP telephony becomes apparent.

Consider the example illustrated in Fig 4. ABC Widget has 90 employees located in four facilities involving the design, manufacture, sale and support for various lines of widgets available across Canada. Sixty staff work in a Windsor head office location that performs R&D, manufacturing, administration and warehousing. Local points of presence exist in Montreal, Winnipeg and Vancouver, each with 10 employees focused on regional sales, office support, parts and customer service. ABC's strong commitment to customer support means that there is a great deal of voice traffic between all branches as well as heavy inbound call activity from customers looking for product information, sales, parts and customer support.

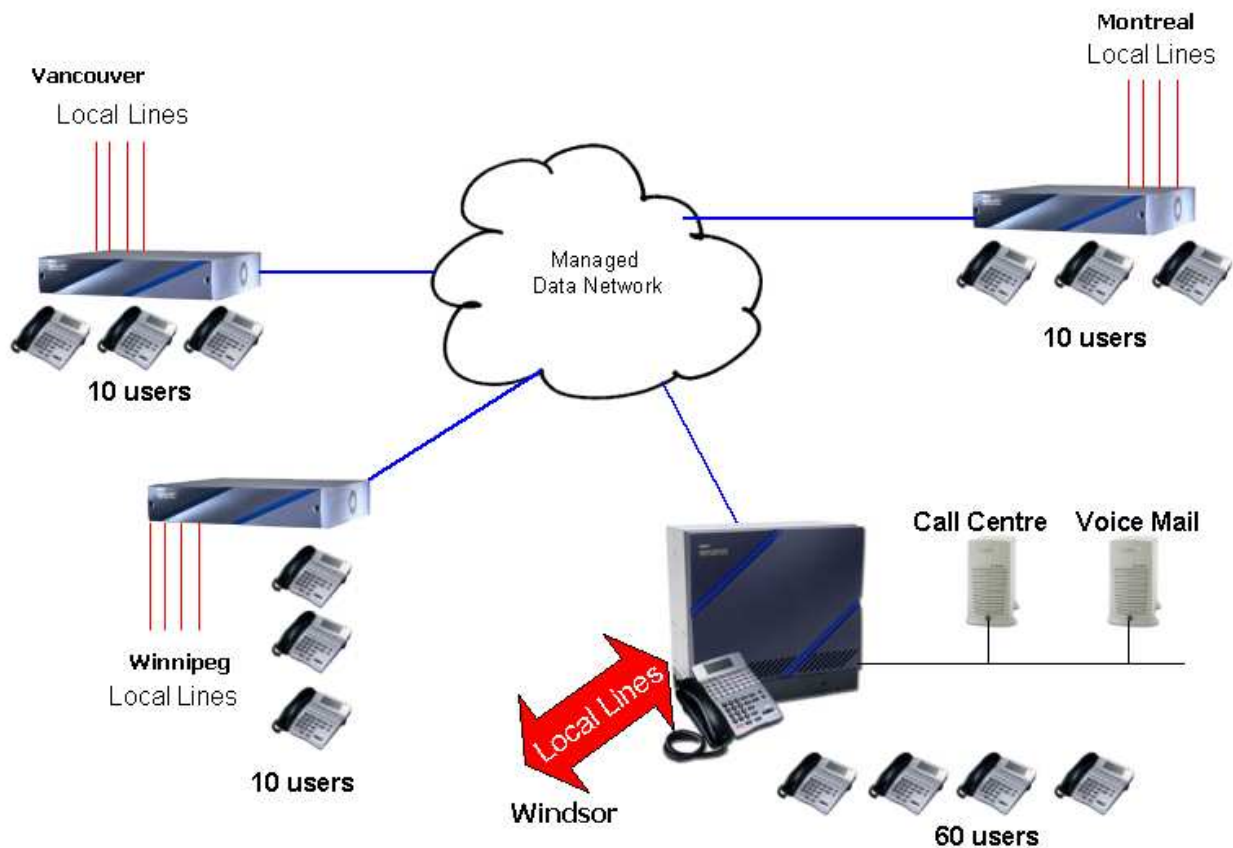


Figure 4 – Enterprise Topology

An enterprise IP-PBX would allow the installation of the main processor in the Windsor location to provide digital telephone sets on staff desks, voice messaging and telephone local line access. Remote locations are served by survivable branch systems that are controlled by the

head office CPU. These branch systems have their own local lines and PBX feature sets connected to them and are in turn connected to the head office system via managed IP connections. If for any reason, the data connection is lost, the branch system continues to operate in “local mode” with it’s own lines. Once the data network is restored, the branch system automatically reconnects and enterprise operation is restored.

The enterprise configuration provides solid ROI by offering features and applications that drive new revenue, cut costs and improve communication. Some of these capabilities are noted below.

On-net/off-net dialling – as the main system is aware of all lines connected to it, a call made from Windsor to a client in Richmond, BC is placed immediately out of the Vancouver branch system. All the Windsor caller need do is dial the 10 digit BC number and system routing automatically places the call via the most cost effective connection. Similarly, a call made to any of the branch offices can be routed anywhere in the network without any input from the caller. Internal (intercom) calls are made directly from desk to desk without any long distance charges.

Complete feature transparency - IP networked systems are completely feature transparent. Voice calls, Call Park and Page, transfer, busy extension indication and Caller ID are available to all phones in the enterprise as if they were located in the same office. Calls answered at any location in the network can be transferred seamlessly to any other location.

Economies of scale in Telco network access – as all lines are available to all users, the total number of lines to support all offices is reduced. In some cases this can amount to a 25% reduction in local loop charges but without any decrease in call handling capability.

Tele-workers - remote sales agents can connect via VPN to any office, access email, make and receive phone calls and participate in sales conference calls ... all through a full function PBX business phone

Peer-to-Peer IP operation – bandwidth efficiency is maximized between branches in that calls between a Vancouver local phone and a Vancouver local line are set up by the enterprise CPU, but once established no network bandwidth is used

Centralized Licensing – a true enterprise IP PBX allows the system manager to purchase licenses for Call Centre agents, IP Phones, IVR etc and distribute them anywhere in the network. In the ABC Widgets scenario above, a 10-agent call centre agent license would support agents connected to the Vancouver, Winnipeg, Montreal and Windsor systems. Furthermore the management reports, call-flows and real time reporting are all consolidated on 1 screen in real time giving much greater flexibility. This is a key benefit of a proper enterprise IP deployment and something that is not supported on IP-enabled key systems

Enterprise Call Centre – pushing the call centre out across the enterprise offers real advantages over centralized arrangements and also offers a strong ROI on an IPTel investment. Agents can be distributed to accommodate different time zones, skills-based routing can direct calls to the most appropriate agent anywhere in the enterprise, calls from predominantly French speaking areas can be seamlessly connected to bilingual agents, real-time call centre status is available across the network and callers can be connected to the agent that last handled their order ... all in a way that is transparent to the caller or to the agent!

Recommendations

While all of this new IP-enabled technology seems very attractive, is it finally ready for prime time? The answer is an unequivocal yes if one considers four key issues when planning a migration to an IP-enabled environment.

Pick the right platform – This may sound like an unnecessary statement, but many projects start off on the wrong foundation, particularly in enterprise deployments with smaller remote locations. As noted early in this paper, companies with smaller user requirements in individual branches have traditionally used a key system to provide phones, voice mail and other applications to the local office. Nortel's Norstar product family for example, has been designed for and targeted at the small to medium sized, stand-alone business. In this respect, it does a credible job for mid-sized applications that do not have significant demands for traffic, physical growth, sophisticated call centre/IVR/Speech Recognition/802.11, or networking.³

Many Nortel vendors, unaware of the functionality of true IP networking, promote the newer version of the Norstar called the BCM as a solution for companies with 2, 3, 5 or more offices that need an enterprise solution. These vendors, often with a background in installing stand-alone key systems for businesses, assume that since the BCM supports IP phones and IP trunks, it is an enterprise switch. In fact it is not.

An enterprise system, even for smaller remote branches needs to support advanced networking capability including;

- Set-to-set feature transparency
- On-net/off-net dialling
- Enterprise access to IVR, advanced call centre routing and reporting
- Centralized voicemail related applications such as Unified Messaging, text-to-speech and Voice Recognition.
- Tandem Networking
- Survivable remote branch systems
- Centralized Management and Reporting
- Branch local line access with network call routing

Choose the right VAR – Selecting the right VAR is another important step in setting the stage for a successful project. Many interconnect companies (telecom VAR's) may have had years of experience in traditional telecom may be completely unaware of the complexities of a proper IP telephony deployment. Similarly, many data VAR's, looking at IPTel as a new business opportunity jump into the industry without any real understanding of telecom connectivity or of its 24/7 onsite-service requirements.

Seek out companies that have a documented track record in both technologies, ask to see a sample project plan, ask for references and call them. Furthermore, ask for specifics on the VAR's post-cutover support process. How are problems resolved? How are remote systems

³ Nortel themselves recommend their Succession 1000 system as the choice for enterprise applications. "Nortel Networks Survivable Remote Gateway has been specifically designed to extend the desktop features and user interface of Nortel Networks Succession* 1000 IP PBX (private branch exchange) platform to give remote-site users full access to the same features and applications available at the main corporate site. Nortel Website News Release, April, 2004 http://www.nortelnetworks.com/corporate/news/newsreleases/2004b/04_06_04_srg.html

supported? What change management tools are available? Is live, tech help-desk support provided and if so what rates are charged?

Demand a team approach to the deployment – Any successful deployment demands that the telecom VAR and the data network provider have a very clear understanding of the project. Take the time to research companies that have existing working relationships and have already deployed applications similar to yours. Focus on how problems are resolved during and after the project is complete. Avoid scenarios where you as the customer are stuck in the middle of two different vendors (or divisions of the same company) are blaming the other for a problem

Understand where IP telephony can provide the best ROI - Finally, one of the mistakes that IT managers can make when considering IPTel deployments is that, because IP technology is available, it is used to solve all of the challenges that arise in a project. This short paper has attempted to highlight areas where IPTel has solid, measurable business benefits for call routing, applications development and system management. Long distance savings, once the primary factor in IP is now a minor benefit to the organization. Focussing on the primary business processes and the cost savings associated with improving them are crucial to building a viable business case for an IPTel implementation.

Contact Information

IP is ***enabling*** technology that supports new, more effective business processes for companies of all sizes and industry verticals. For more information on how a proper IPTel implementation can help your organization, please contact:

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A complimentary, objective, discovery meeting is available at your convenience.