

ISDN REPLACEMENT AND MIGRATION TO SIP TRUNKS

Most large tier-1 Telcos have announced their planned dates for the end of life for ISDN circuits and although some of those dates are still a few years away, the prudent enterprise will be looking at the options. Many companies have already moved to SIP trunks, taken advantage of the 30% to 50% reduction in telephony costs and made good use of all the latest features available through VoIP.

There are three main categories of telephony PBX -

- old legacy systems that do not support VoIP
- legacy PBX systems that can be upgraded to support VoIP
- VoIP PBX systems.

Throw into the mix the PBX ownership vs contract and the various maintenance agreements; there are many different starting scenarios for a company, however the ultimate goal is to save money by moving away from the expensive legacy PBX and the expensive ISDN circuits before you are forced to do so by the telco.

Costing Considerations

IF the current PBX is an old legacy system that does not support VoIP connectivity all is not lost. Some of these systems were very expensive indeed and some are still on expensive maintenance contracts. Simply adding a SIP gateway to bridge the gap between the VoIP world and the legacy system can provide a working solution. Often companies will instead opt for a more flexible SIP server solution that will provide the SIP gateway functionality, but will also provide a new IP PBX platform to allow the company to migrate away from the expensive legacy systems when financially convenient for the business.

IF the current PBX can be upgraded to support VoIP - Is the upgrade cost effective ? Can the upgrade provide all of the latest VoIP features ? Will the upgrade be tied to a proprietary manufacturer's support ? Will the options allow the company to freely migrate to VoIP when convenient for the business ? It is often more cost effective to move away from proprietary system and maintenance companies and look at vendors and equipment that will 'play nice' with others so you are not tied into expensive contracts or one vendor's products.

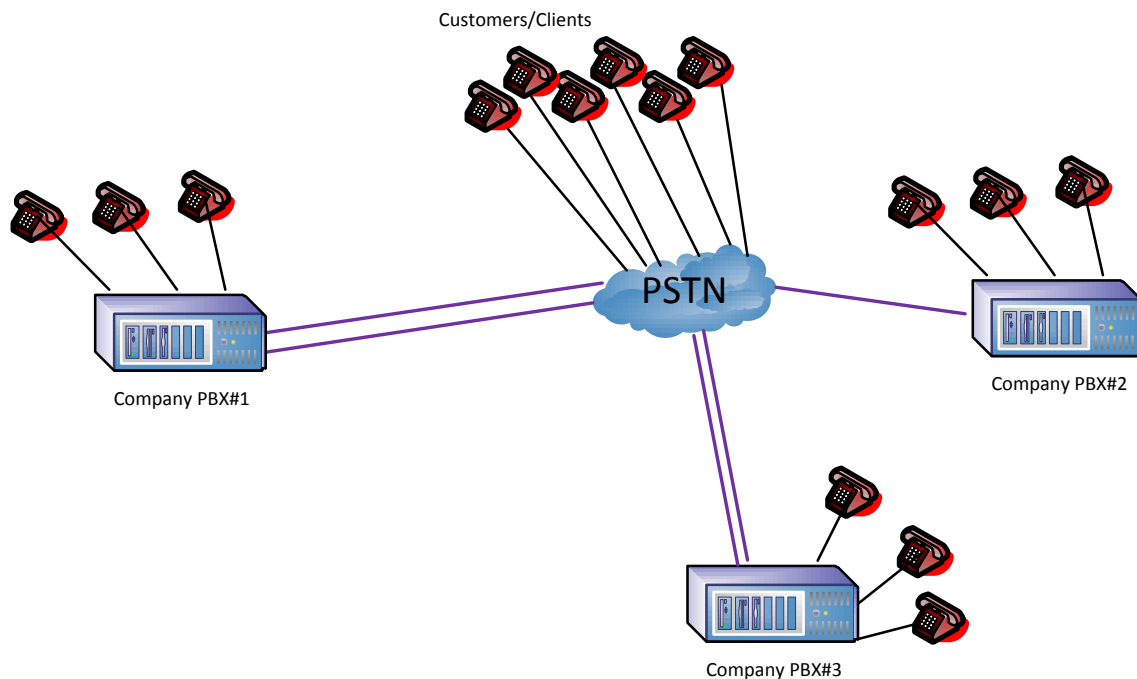
IF the current PBX supports VoIP connectivity - Is it currently using ISDN circuits ? What is the cost to move to SIP trunks ? Is the system using a tied or proprietary company's support and maintenance ? It is often more cost effective to move away from proprietary system and maintenance companies and look at vendors and equipment that will 'play nice' with others so you are not tied into expensive contracts or one vendor's products

No matter what existing PBX systems are in place, the object is to save money on telephony and plan ahead to make the most of the existing systems while moving to the latest technologies, but in a time frame that fits the business financially and causes least disruption. Most enterprise companies have the same goals = minimise telephony costs while improving functionality with minimum disruption.

VoIP connected PBX systems in the enterprise should be providing for the basic requirements ; Low cost maintenance, High availability, Low cost calls with least-cost-routing, Feature rich services to suit the business (video/voicemail & unified messaging, conferencing, IVR/menus, full mobility, contact center functionality, reporting, least cost routing of calls, zero cost calls between company sites etc..), no ties to proprietary manufacturers, freedom to interface with any manufacturer (open standards).....

Examples for a three-site company

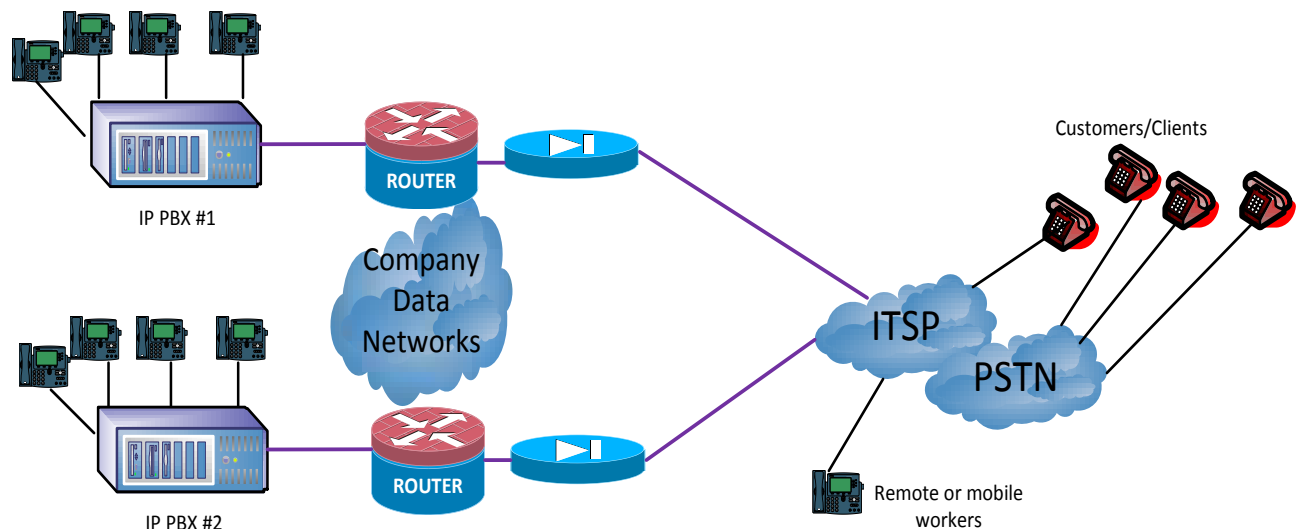
Traditional PBX Infrastructure ;



Dedicated ISDN PRI circuits from the local telco into each of the company sites with DID numbers allocated and fixed to the local ISDN PRI. Company will also have a separate network of circuits and services for the data connectivity. Company pays for calls between sites and to clients over the PSTN networks of the telcos at each site/country etc... Company pays long distance calls from site#1 to site#2 and pays full price for calls outside of the site local area. Company pays high price for ISDN PRI circuit rentals and pays for PBX maintenance from the manufacturer or vendor. Any changes and upgrades to the PBX must be done through the vendor and all parts and protocols are proprietary. Adds moves and changes are difficult as

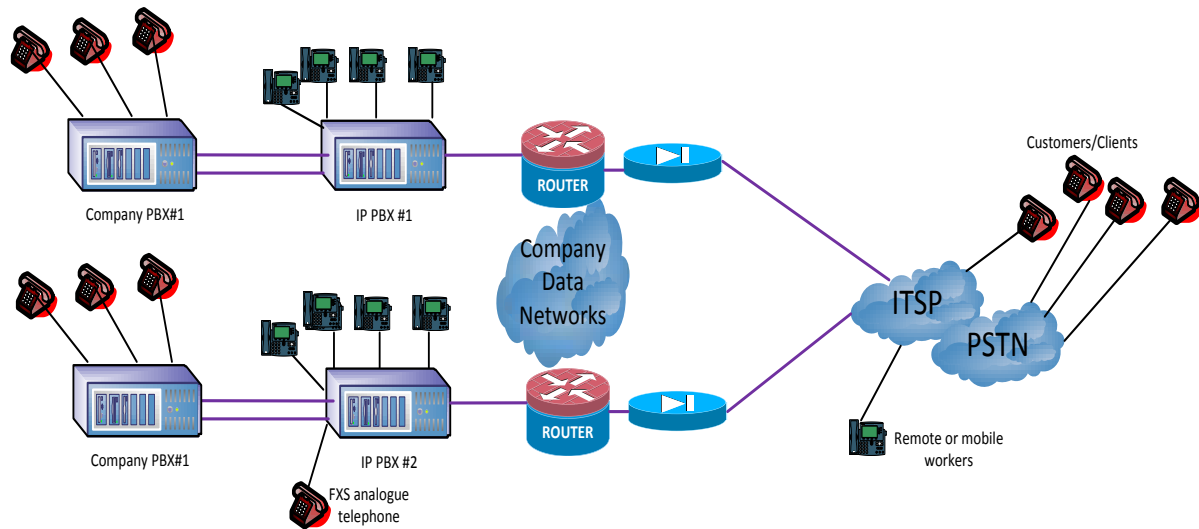
the extensions are hard wired to the legacy PBX. Failure of a site PBX results in approx. 4 hours outage for that site while the vendor sends an engineer to the PBX (single point of failure).

VoIP PBX Infrastructure ;



ITSP example using the Internet to connect to the outside world and remote workers etc.. ITSP provides DID numbers and full reporting on SIP trunks into the company sites. Company data networks used to route calls between sites at zero cost. Redundancy is provided over the company networks if an outage occurs with the site Internet connection. No expensive ISDN circuit rental and no expensive call charges. IP PBX provides full feature set (video calling, remote mobility, voicemail unified to email, IVR menu systems, call conferencing, calls use least cost routing, detailed call reporting etc...), IP PBX often installed as high availability pair or cluster to ensure resilience. Adds moves and changes are easy as the telephone numbers are not hard coded to individual extension cabling - telephones are open standards IP devices or softphone clients = fully mobile.

PBX with VoIP Integration ;



ITSP example - New IP voice servers can be phased into the infrastructure and eventually positioned to take the place of the original PRI circuits into the old legacy PBX. Old legacy telephone hand sets can remain on the old PBX or be migrated to the new IP PBX in addition to any new IP phones brought into service. Initial phase might have the legacy PBX connected to the ISDN PRI circuits at the same time as the IP PBX connects to the SIP trunks, then as the ISDN circuits are disabled by the telco, move the PRI connections from the telco to the new IP PBX so enabling the legacy PBX to remain in service for as long as financially liable.

ITSP provides DID numbers and full reporting on SIP trunks into the company sites. Company data networks used to route calls between sites at zero cost. Redundancy is provided over the company networks if an outage occurs with the site Internet connection. No expensive ISDN circuit rental and no expensive call charges. IP PBX provides full feature set (video calling, remote mobility, voicemail unified to email, IVR menu systems, call conferencing, calls use least cost routing, detailed call reporting etc...), IP PBX often installed as high availability pair or cluster to ensure resilience. Adds moves and changes are easy as the telephone numbers are not hard coded to individual extension cabling - telephones are open standards IP devices or softphone clients = fully mobile.

Selecting A SIP Trunk Provider

Don't be forced into the SIP provision from the local telco that is currently retiring your ISDN circuits. The ISDN telco will always try to recover the money they will be losing when ISDN reaches end of life.

Always consider the options and try to replace your ISDN circuits with two different SIP providers to minimise any single points of failure.

It can be useful to diagram and/or document the call flow for the enterprise prior to designing the requirements specification for the telephony infrastructure - i.e. which sites have the most calls between them and/or between main PSTN area codes. This information is essential prior to selecting the SIP trunks in order to optimise the provision location for maximum calls at lowest cost with best resilience/redundancy etc...

Three Main SIP Provision Methods

- **TSP (telephony service provider)** will provide SIP trunks on dedicated circuits. Provision is often via a managed customer edge SBC to ensure site security, services are monitored and dedicated. The TSP should have several sites to provide full resilience and redundancy. Often the TSP provides a dashboard for management and reporting.
- **Dedicated SIP trunk** can also be implemented between enterprise sites and/or between companies using any data circuits or paths through existing networks. Great for corporate networks allowing all company offices to communicate over the data networks at virtually zero call cost and minimal implementation costs - QoS and bandwidth availability on the company data network are obviously a consideration. Important to consider the demarks between telephony and data networks.
- **ITSP (internet telephony service provider)** will provide the SIP trunks over the Internet. The ITSP should have several sites to provide resilience and redundancy. You will have to consider NAT and public addressing when using an ITSP which can be complex for large implementations, but works very well for small enterprise.

CONSIDER - **The larger TSP networks** can provide an end-to-end SIP architecture which allows better rerouting and disaster-recovery than any traditional TDM ISDN service. Check where the provider breaks out onto the PSTN networks and verify their redundancy and quoted uptime.

CONSIDER - **SIP provider flexibility to suit the business** = auto failover and call re-routing with primary, secondary and tertiary priority that can be configured and monitored by you. IP level redundancy, load balancing and failover suited to your business requirements

CONSIDER - **Emergency** number services and the need for any analogue or alternate SIP services for E911/999/112 etc...

CONSIDER - **Security for telephony is very important.** IF your enterprise has to be PCI compliant, you must consider the storage and handling of voice calls so that credit card and personal data is not compromised. Security for the VoIP systems has to go through the same management you use for your data firewalls with regular audits and updates to mitigate against the latest vulnerabilities. IF you are moving from an old legacy PBX this will be very new to the company and may need investment in equipment and training.

IN SUMMARY

In most cases, we have until 2020 before ISDN is completely removed, but only until 2017 in some countries before many telcos are no longer supplying ISDN circuits. Some EU countries have already moved to IP and no longer support ISDN. By planning NOW we can minimise the disruption and make the most cost effective decisions to move the telephony systems into the 21st century at a pace suitable to the individual business.

Rather than performing a knee-jerk reaction and implementing the PBX vendor or telco recommended upgrade path to VoIP, you can plan toward vendor-free open standard telephony which will provide the best value as you migrate the PBX in stages suited to your business.

- Plan NOW for ISDN to SIP migration
- Continue to use legacy PBX systems
- Implement VoIP alongside the legacy PBX
- Migrate to the VoIP system when financially viable
- Phase out the expensive legacy PBX and maintenance
- Phase out the expensive ISDN circuits
- Phase out the restrictive legacy telephony hand sets
- Migrate to the VoIP systems for full functionality, easy adds moves and changes
- Migrate to SIP trunks to lower call costs