

Transitioning Business Telephony from Legacy to VoIP: A Brief Introduction by: Mark Wiles / VP of Engineering

In looking to the future we must first understand the past. Therefore, let's take a look at the world of telephone service as it exists and has existed without VoIP (voice over internet protocol).

UNDERSTANDING TELEPHONE SERVICE WITHOUT VOIP

Outside of VoIP there are four types of legacy telephone services available to the business community:

1. Standard POTS
2. Standard POTS lines key systems
3. PBX systems
4. Centrex systems

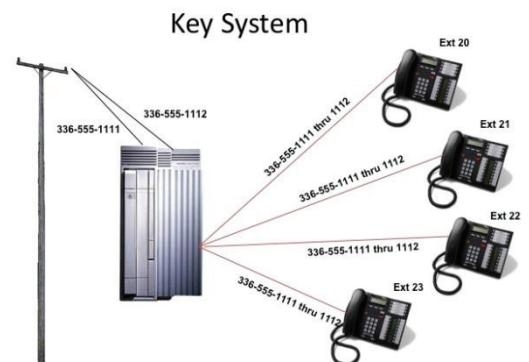
Standard POTS Lines

A POTS (plain old telephone service) line is a phone service supplied by the local telephone company and is much like your home phone service where one copper pair cable provides a single telephone number (line). POTS lines have been a mainstay for small businesses because they have been cost-effective in initial startup when only one or two lines and phones have been required. Their downside would be moderate-to-high monthly reoccurring costs, lack of features and limited expandability.



Standard POTS Lines: Key Systems

A key system is hardware-based, physically located in a small-to-medium business and is normally deployed when no more than eight POTS lines to the outside world are needed. Usually, there are more telephones than there are lines – this is called “oversubscription.” The concept is that all phones will not be used at the same time. A key system phone has a line key assigned for each outside line and, to make a call, you must manually select an available line. They can offer a small business some limited features such as call transfer and voicemail at a reasonable startup cost (usually \$1,000 to \$5,000). Expandability is fairly limited and in most cases, costly. To meet customers’ needs, a contracted support provider usually must perform any necessary changes.



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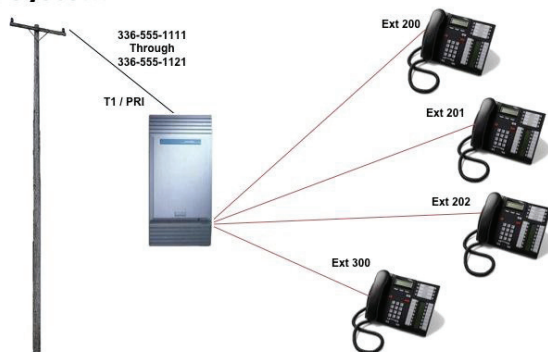
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PBX Systems

Unlike a key system, a PBX (Private Branch eXchange) does not have line keys assigned on a phone to each line to the outside world; instead, the lines are pooled into groups and therefore utilize over-subscription. To make an outside call, you select a line by dialing nine (in most cases) and the system automatically assigns an available line for the call. A PBX system is hardware based, located at the customer facility and is normally deployed for large businesses needing many phones (usually greater than 25) and more than five or six lines to the outside world. Those trunks (lines) usually terminate to the telephone company via T1's or PRI's.

A PBX usually offers numerous features to a customer, at a fairly substantial initial cost - often greater than \$20,000. Because of the complexity of a PBX, changes needed by a customer require programming by a highly skilled technician on staff or by a contracted service provider.

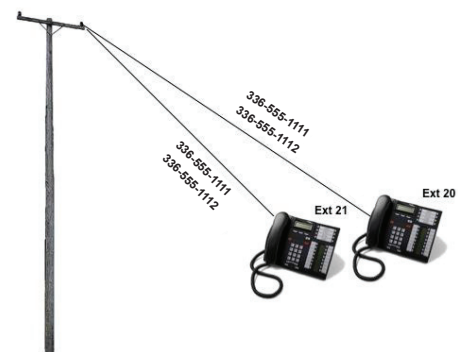
PBX System



Centrex

Centrex is conceptually like a PBX in functionality, but it is hosted (located) at the phone company, so the physical telephones would be the only hardware at the customers' facility. Centrex can offer most of the same features as a high-end PBX without the large initial cost. However, the monthly recurring costs can be expensive. Programming changes needed by a customer are done on the phone company's schedule, and therefore, may prove to be timely.

Centrex



Transitioning Business Telephony from Legacy to VoIP: A Brief Introduction (continued)

So far we've discussed four types of legacy telephone services available to the business community. Let's stop a moment and summarize them.

POTS Lines

- Deployments: SOHO (small office / home office); one-to-two lines / phones
- Strengths: low initial investment for hardware; little-to-no maintenance costs
- Weaknesses: lack of features; limited expandability; high reoccurring monthly rates

Key Systems

- Deployments: small-to-medium offices; two to eight lines / multiple phones
- Strengths: common features; reasonable hardware startup costs
- Weaknesses: limited expandability; costly support; maintenance contract needed

PBX Systems

- Deployments: large office / campus; high call volume; many phones / trunk count
- Strengths: flexible features; highly expandable
- Weaknesses: high initial cost; complex programming; costly support / maintenance

Centrex

- Deployments: diverse locations; large facilities / municipalities
- Strengths: minimal capital outlay; maintenance / service usually included
- Weaknesses: high monthly reoccurring costs; programming is telco based

UNDERSTANDING VOIP

We have looked at the past. Now let's look at the future and see how legacy systems and VoIP compare. Proven VoIP options include:

- Single VoIP lines and trunks
- Hosted PBX service
- vPBX solutions (virtual PBX)
- Hybrid systems

The benefits of using VoIP for telephony include:

- Rich features
- Extreme flexibility
- Diverse transport and delivery options
- Lower monthly costs for local and long distance service in most cases
- Superior digital quality, better than landline
- Service and support usually included
- Reduced dedicated hardware costs
- Geographical diversity options

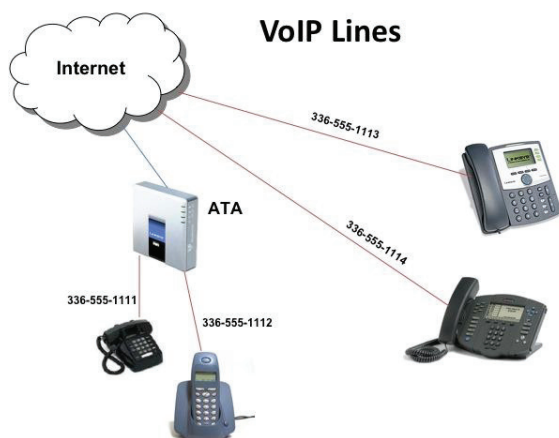
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Single VoIP Lines and Trunks

In concept, single VoIP lines and trunks can be thought of much like a POTS line from the local telephone company, with a few exceptions. They are of course delivered via a broadband internet connection and are more feature-rich with functions such as unified messaging, find-me-follow-me and selective call services. One of the major influencing factors that most take into consideration in migrating to VoIP service is the cost. Frequently, a significant savings in both local and long distance service is realized. Specialized hardware such as a VoIP phone, IAD (integrated access device) or ATA (analog telephone adapter) is required. Also, VoIP trunks can be utilized with legacy equipment such as a key system, allowing the subscriber to benefit from the savings usually gained in a transition to VoIP. Deployment of VoIP lines and trunks are generally done in applications requiring only one or two lines, such as a small or home-based office using VoIP phones or small business operation using a legacy key system or PBX.

This illustration shows how VoIP lines connect to the internet via VoIP phones and ATAs. Specialized hardware such as VoIP telephones and ATA-allowing analog phones can be utilized effectively to provide economical service for one or two line offices.

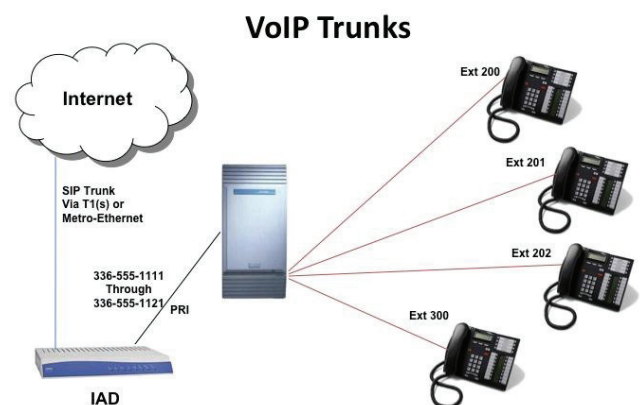


As you see in this illustration, a legacy key system with its key phones can be connected via VoIP trunks allowing a business to benefit from the cost savings realized by transitioning to VoIP.

VoIP Lines with Key Systems



This example illustrates how VoIP lines connect via the internet to a key system by means of an ATA.



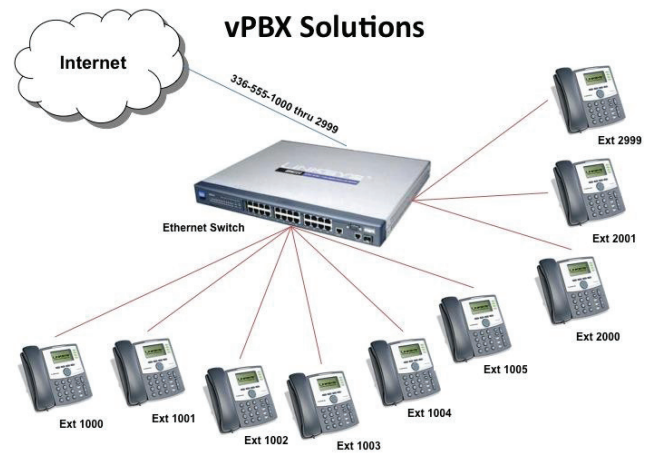
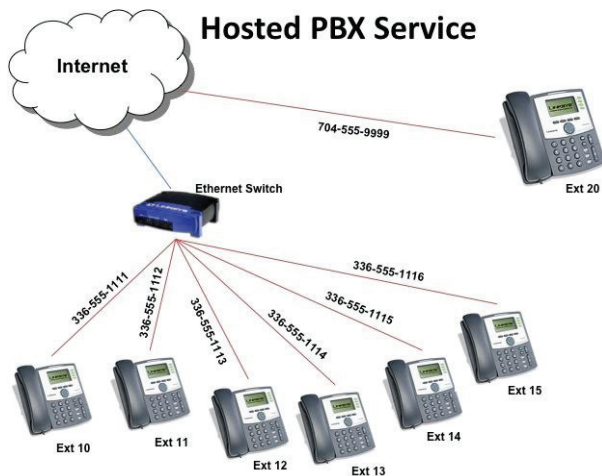
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The term “hosted PBX” is somewhat of a misnomer. This service might be better thought of as a “hosted key system.” With the exception of the VoIP phones, all telephony hardware is hosted (located) with the service provider (ITSP) and, in most deployments, there is one DID (direct inward dial) number associated with each line key on the phone, much like with a key system. Strong selling points of this service include geographical freedom (Hosted PBX telephones can be located anywhere in the world instead of all in one office) and a rich offering of features and functions. Auto attendant, find-me-follow-me, unified messaging, selective calling services, extension dialing and transferring are just some of the PBX-like features that make hosted PBX a popular service choice. Typical deployments can range from a small office with two phones to a small-medium business using five to ten lines. The maximum number of lines is dependent upon available broadband bandwidth.

vPBX Solutions

The vPBX (virtual PBX) is a solution that is, in many ways, akin to a customer-based hardware PBX. It also offers geographical freedom and is feature-rich like the hosted PBX service, but differs in that there’s not a one-to-one match between the number of lines to the outside world and the number of phones. vPBX relies on oversubscription. For example, there could be 12 lines (virtual facility trunks) to the outside world and 48 desk phones (virtual PBX lines) resulting in an oversubscription ratio of say one-to-four. The total number of virtual facility trunks is throttled-down by the internet telephone service provider (ITSP).

vPBX solutions are ideal for large corporations, educational facilities and municipalities. They are cost-effective in that less CO (central office) lines are needed to support a large number of desktop phones (again, due to oversubscription).

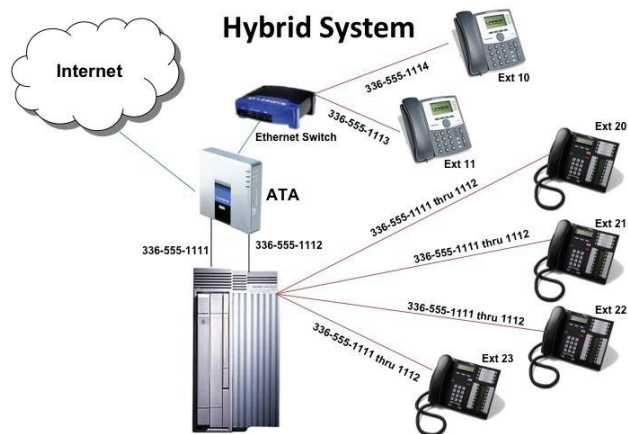


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Hybrid Systems

The hybrid system is a solution that allows businesses to utilize their existing key system (not PBX) along with additional VoIP phones as a way to economically expand as its needs grow. It also facilitates a smooth, gradual migration to a total VoIP solution. High-level, the key system's CO (central office) facing side would connect to an ATA (transitioning VoIP to copper lines). The VoIP provider then creates a business group and each individual line is assigned an extension number. VoIP phones can then be added to that business group, thus allowing limited extension-to-extension dialing and utilization of such features as a MADN (multiple appearance directory number), call hunting and auto attendant. This solution is ideal for customers that are reluctant to do a complete system replacement of their legacy system.



Let's summarize the VoIP options we've just discussed:

Single VoIP Lines and Trunks

- Deployments: small office / home office; one-to-two VoIP phones / key systems and PBXs
- Strengths: low initial and recurring costs; no maintenance charges; feature rich
- Weaknesses: potential service interruption because of power or internet outage, although there are ways to mitigate this issue

Hosted PBX Service

- Deployments: small-to-medium offices; two to ten lines / multiple phones
- Strengths: low initial and recurring costs; no maintenance charges; geographical freedom; feature rich
- Weaknesses: potential service interruption because of power or internet outage, although there are ways to mitigate this issue

vPBX Solutions

- Deployments: large office/campus; high call volume; many phones / trunk count
- Strengths: low cost; geographical freedom; flexible features; highly expandable
- Weaknesses: potential service interruption because of power or internet outage, although there are ways to mitigate this issue

Hybrid Systems

- Deployments: small to medium businesses with legacy key systems
- Strengths: minimal capital outlay; migration path to total VoIP solution
- Weaknesses: potential service interruption because of power or internet outage, although there are ways to mitigate this issue

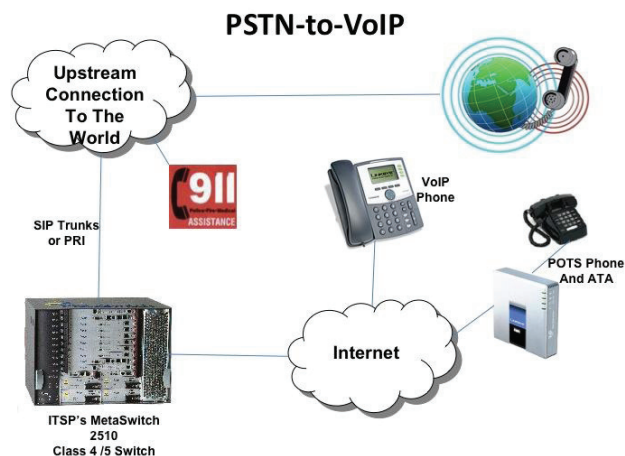
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To complete our view we now need to look at how the PSTN (Public Switched Telephone Network) connects to a VoIP network.

PSTN to VoIP

As illustrated in this graphic, a VoIP provider connects to the outside world much the same way as other carriers interconnect, that is via trunks (T1's, PRI's or SIP, is usually the case). The VoIP provider then connects to their customer base either over the public internet or via controlled (private) networks. ITSP's generally connect to E911 PSAP's (Public Safety Access Points) either directly or via an inter-connection provider.



In conclusion, VoIP can, in most cases, provide a customer with superior quality service, rich features and significant cost savings. Transitioning to VoIP services makes sense because:

- VoIP includes rich features usually not available with non-VoIP service including
 - Find-me-follow-me
 - Unified messaging
 - Web portal (web portals offer services such as e-mail, news, stock prices, information, and entertainment)
- VoIP offers extreme flexibility allowing business group features to span wide areas
- VoIP offers diverse transport and delivery options allowing dynamic bandwidth
 - DSL
 - T1
 - Metro-Ethernet
 - Wireless
- ITSP rates, in most cases, significantly lower than the incumbent
- Digital audio quality vs. traditional analog
- Expensive service and support contracts can usually be eliminated
- Hosted services reduce the need for most dedicated hardware
 - No PBX or key system required – significant initial savings
 - Minimal staff training and support needed