

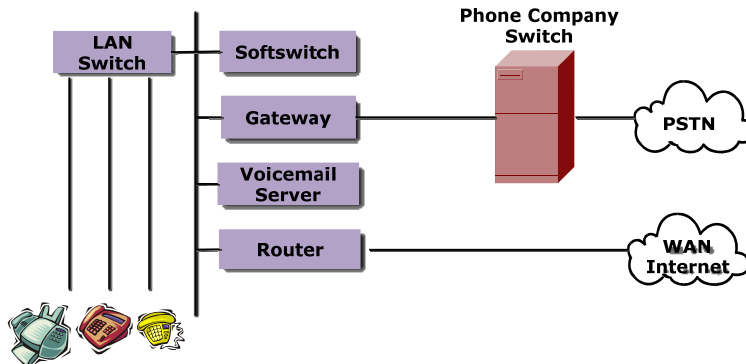


What is an IP-PBX?

IP-PBXs are rapidly replacing traditional PBXs and key systems. There are a number of reasons for this trend, but our purpose here is to explain how IP-PBXs work.

Requirements

- For an IP-PBX to work, it needs to replace the key functions of a traditional PBX:
- Call control
- Interface with the public switched telephone network (PSTN)
- Support user phones



Call Control

To perform call control, the system must act on signals from the calling phone. This requires specialized call processing software that tracks and manages call progress and handles conversion between the IP addresses used on data networks and telephone numbers. Think of this device as an automated operator, handling all the tasks the switchboard operator – or a PBX – handles. We will refer to this device as a softswitch. Another common name for it is an IP-PBX.

Interface to the PSTN

Until the world converts completely to IP, we need a way to communicate between the IP world and the circuit-switched world. Gateways accomplish this function.

User Phones

While a complete system with a softswitch and gateways can potentially support existing analog handsets, in practice, most implementations use IP phones. Phones can either be hardware devices that plug into the Ethernet network and look just like a normal legacy telephone or softphones that run on the user PCs. IP phones actually provide the functionality of a single user gateway, converting the analog speech pattern into digitized voice packets which are then sent over the IP network.



A Cisco IP Phone

Today's IP phones have software hooks for customization and are far more flexible than their legacy counterparts. Even the simplest of telephone designs can be extended with applications that reside on the user's PC.

Today's IP phones also provide intuitive interfaces with access to application-rich features and is also capable of leveraging recent improvements in sound quality to provide a better experience for users and the people with whom they communicate.

The Complete System

Using these components:

- Softswitch for call control
- Gateways to interface to the PSTN
- IP phones for users

Let's see how they work during a call.

- A phone tells the PBX if it is off hook, on hook, etc.
- The IP-PBX sets up calls, finds routes, keeps track of the phone's state
- The IP-PBX converts between telephone numbers and IP addresses
- Once a call route is established, the IP-PBX gets out of the way so that the path for the voice stream is independent of the IP-PBX
- If the call is leaving the IP network and being routed to the PSTN, a gateway converts the IP packets back into the appropriate format for the trunk
- If the call is being sent to another IP device, the call may be managed by multiple IP-PBXs. But when the packets reach the called party's phone, they are converted back into voice.