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choosing IP phones

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AS VOIP GAINS POPULARITY, MORE businesses and home users are looking for innovative ways to incorporate this technology into their everyday lives to enhance communications with colleagueS, business associates, friends, and families. In most cases, the piece of equipment and technology they choose for VoIP enablement will dictate the prospect they have with VoIP.

What is a good IP phone? Is there a single VoIP client that runs on Windows, Linux, and Mac? What features should I look for when sourcing IP phones? These are common questions asked by IT managers and technology experts who are involved in the implementation of a VoIP platform. The quick answer is, "It all depends . . ."

Soft Phone

Whether you are looking for a soft phone or a hard phone, gathering requirements from different user groups is essential to successful deployment of chosen technology. Here are examples of what a soft phone should do:

- Run on multiple platforms, including Windows, Mac, and Linux
- Have the same interface for configuration across all supported platforms
- Work well behind NAT gateways
- Support noise and echo cancellation
- Utilize minimum bandwidth and offer various CODECs
- Support out-of-band Dual Tone MultiFrequency (DTMF; better known as Touch Tone)
- Display caller ID

X-Lite (by CounterPath, formerly Xten) is one of those software-based SIP phones with multi-platform support, running on Windows, Mac, and Linux. The next versions up, X-Pro and eyeBeam, support even more CODECs and have video conferencing capability. Most will find X-Lite or eyeBeam sufficient to connect local and remote users to the company's IP PBX for accessing voicemail and for normal voice calls.

The protocol-savvy may prefer an implementation based on Inter-Asterisk eXchange (IAX); not only can it guarantee more effective use of bandwidth, but it can eliminate confusion regarding out-of-band DTMF, a problem to which some SIP setups are prone. Some IAX soft phones offer more

choices of CODEC over their SIP counterparts. An example is IAXComm, an open-source application that runs on Windows, Mac, and Linux. Of course, this will require an IP PBX that supports the IAX protocol, Asterisk.

A soft phone setup isn't complete without a good headset, especially on laptops. Acoustic echo, whereby voice received leaks into the stream of audio sent, is a common problem found with laptop users. As a result, the distant party can, irritatingly, hear his or her own voice. The effect often worsens with higher amplitude of the echo or with longer delay. By physically separating the microphone and speaker, such problems can be prevented. Since most laptops today are shipped with Bluetooth, using a soft phone with such technology may not be a bad choice, if your budget allows.

Hard Phone

With traditional PBXs, it is common for vendors to employ proprietary signaling on handsets and phone switches. Investment in handset equipment from any particular vendor will often lead to costly upgrades and maintenance of the system. With IP PBX, you now have the option of managing your own telephony equipment and perhaps have significant influence on what features such equipment should provide.

Basic IP phones residing on employee desktops, in cafeterias, in reception areas, or at loading docks should have the following essential features:

- A multi-line LCD display
- Caller ID information and call status
- The ability to switch multiple lines
- Call hold, retrieve, and transfer features
- Speed dialing and redialing from call history
- Volume adjustment

The Grandstream GXP2000, Snom 190, and Siemen OptiPoint 410 are examples of basic IP phones; they range from $100 to $400.

Power users, managers, and executives, with more demanding telecommunication needs, often opt for sophisticated models, which include features such as these:

- Full graphic display rather than multiline LCD
- Color displays and backlit buttons
- Built-in full-duplex speaker
- Auxiliary port for headset support
- Message waiting indicator (MWI) (some basic phones also have this feature)
- 10/100 Mbps switched PC port
- Compliance with power over Ethernet (802.3af)
- Web browser
- Voice encryption
- Support for various CODECs
- Conference capability

Cisco's 7960 and 7970 are phones in this class. High-end phones typically cost $400 and up. The Cisco 7914 module expands conferencing and transfer capability of the Cisco 7900 series phone, making it ideal for console operators who need to set up bridges, route incoming calls, and forward calls. The alternative is to use the vendor's softphone app running as a PC interface.

To ensure that your investment in hardware is protected, firmware images are generally made available by vendors to implement new features and to provide bug fixes (alas, they sometimes introduce new bugs). These firmware images are usually loaded at boot time from a TFTP or HTTP server, along with provisioning parameters. IP phones are usually provisioned in two steps, first with some generic parameters, such as server or proxy addresses, and second with phone- or account-specific parameters. After all, each employee's desk phone should have a unique extension number.

Although PoE (power over Ethernet)–capable IP phones alleviate the need to run 110/220 VAC power and have desks cluttered with power bricks and cable, misuse can often lead to expensive repair or a total writeoff of equipment. It is important to understand that not all PoE equipment currently in use is compliant with the standard IEEE 802.3af. According to the standard, the power-sourcing equipment supplies power either on spare pins (10/100 Base-T) or over data pins (1000 Base-T), whereas the powered device must be able to accept power from both options. It is obvious that power supplied to a powered device on the wrong pins will cause damage. Long before the PoE standard was approved in June 2003, vendors had been shipping switches and devices with proprietary PoE capability. This problem is expected to diminish; however, it is always best to check with the vendor for proper compliance, especially in mixed-vendor situations (e.g., using Cisco 7960 IP phones with non-Cisco PoE switches).

Conclusion

SIP has gained a significant foothold in the past months, becoming the protocol many companies are betting their businesses on. On the one hand, there are enterprise telecommunication manufacturers turning away from their well-respected proprietary protocols toward SIP. On the other hand, businesses are searching for SIP peers to allow them to bypass expensive toll charges. It remains too early to tell whether or not SIP will become the predominant protocol for VoIP, but the protocol itself will sure be around for quite some time. Nonetheless, it is advisable to invest in VoIP infrastructures capable of supporting different protocols. In terms of soft IP phones, it may be as easy as running separate applications for different protocols. For hard IP phones, vendors will need to provide different firmware images for each of the protocols they support.