

VoIP: Telephones and Networks

Running voice over IP networks (VoIP) is currently a much talked about technology, but most people are not sure what it means for a professional services firm. As with digital TV, the most obvious fact as far as the end user is concerned, it makes no difference at all. But this is only partially true, and in this article we will have a brief look at what the differences are and why they may be important.

What is VoIP?

Voice over IP is a major change to the way that telephone systems work. Up to this point, if you make a phone call to someone else with a landline phone, you could follow a single length of wire from your phone to theirs. There may be a few joins in it along the way, but these are set up when you dial the number, and disconnected when you hang up.

With VoIP, your voice is turned into lots of separate packets of data, which are all sent individually over a data network in the same way as web pages, email and files are sent between computers. The trick is to get them all together again at the other end in the right order and fast enough that no-one notices any delay, and that is what has led to the long gestation of the technology.

The components of VoIP

There are four components to the phone system based on VoIP:

The *call processor* is the brains of the system, and keeps a record of who is where, who has what phone number and all the other details needed to make everything work. When you dial a number from your VoIP handset, the processor interprets the number dialled and makes the appropriate arrangements to connect you to another handset or perform some other function such as forwarding your calls.

The *telephone handset* does a lot more than you would expect (which partially explains why they are shockingly expensive!). As well as allowing you to dial numbers and access various other features, such as looking up phone numbers in a directory, the handset converts your voice into data and sends it over the network. Note that normally the data for the phone call goes directly from one handset to another; the call processor is only involved in setting up the link at the start. As well as 'traditional' handsets, calls can also be made from a computer running phone software so long as it has a microphone and speakers or headphones.

If you want to connect to the outside world, you also need a *VoIP gateway*. This acts a bit like a telephone handset, but instead of turning the IP traffic into audible voice, it turns it into an appropriate signal for a standard analogue (PSTN) or digital (ISDN) voice circuit, as provided by BT or another telephone company. Note that you also need a gateway for internal devices

that do not use VoIP such as analogue fax machines. If the whole world used VoIP, including the telephone companies, you would obviously not need a gateway.

The final component is the *network* itself. If you want your data network to carry voice, you will need equipment that understands it, and in particular supports QoS (quality of service) and related standards. These help guarantee that time sensitive voice packets get passed through the network ahead of less critical data packets. A well designed network put in recently may well be up to the job, but a network that has grown over time with a selection of entry level switches is unlikely to deliver the quality you expect. The same applies to the much hyped ability of VoIP to use the internet for cheap phone calls; this is technically possible but only at a very basic level of service. Having said that, use of VoIP over an ADSL line to provide a phone extension to a user at home will probably work better than using a mobile phone, which may well be what happens at the moment, as well as being a lot cheaper.

The benefits

A properly set up IP based system in an office will be almost indistinguishable from a traditional digital PBX, so where are the benefits?

First, there are some behind the scenes benefits your IT department will like, mostly in a huge reduction in cabling and patching requirements. Setting up phones and making changes becomes a lot simpler.

Secondly, there are many additional options for remote workers. Not only can system provide an extension to a user at home with full functionality (if slightly reduced quality) but some systems can handle the transfer of calls between the fixed line and a mobile with ease.

A third benefit applies to smaller firms. The standard nature of the system means that they scale from very small (just 2 users in some cases) to massive, without changing functionality. What this means in practice is that small firms can now easily have a phone system with all the advanced functionality that used to be the preserve of larger organisations.

Fourth in the list is the ability to handle internal calls between offices as data, leading to a large saving in the rental of dedicated voice lines or external call costs. Most wide area network connections, except internet based VPN connections, can now be obtained with the capability of handling voice traffic at little or no additional cost to a traditional data only connection.

The final major benefit is one that is not really available yet, but will come. This is the ability to take an IP connection to the public phone network instead of renting individual lines. This is likely to result in cost savings as it will be cheaper to install and importantly will be much more flexible. While this is not widely available as yet, BT's 21st Century Network (21CN) project aims to replace the entire analogue PSTN infrastructure with an IP network over the next few

years. Digital services are likely to transfer to IP over a similar period, at least as far as the end user is concerned.

Conclusion

The most important thing from the perspective of managing a firm is that voice over IP is the way things will work, and will become the standard in the same way that CDs overtook vinyl. The second most important thing is that the technology works now and can already deliver some benefits over a traditional system.

If you are thinking of replacing your phone system, or even investing in your existing PBX, then go for a full VoIP system. If your current system appears to meet your needs, then look carefully at any cost savings or features that may be of benefit, and then plan a replacement accordingly, which may well be planned replacement date anyway.

The most likely firms to benefit will be those with several offices who run their own network between them, and firms with a large number of mobile users or remote workers.

The final change that will make old systems obsolete and replacement a necessity will be when the telcos deliver their voice services over IP. This process is already starting, and 3rd party companies are likely to emerge rapidly to help fill any gaps in this provision.

Adam Westbrooke is the managing director of Firstcourt, a strategic IT solutions company specialising in helping professional services firms. For more information call Adam on 0870 350 3660 or see <http://www.firstcourt.co.uk>.