

# IP Voice is ready for business

## Benefits and implementation choices

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## Executive summary

Voice telephony can now be carried over IP, at business quality and with cost savings and productivity gains. It can be implemented in two ways, either based on customer premises equipment (CPE), or provided as a network service.

This paper looks at what voice over IP (VoIP) is, how the market is developing, the benefits of VoIP, and the choice of implementation strategies.

## Introduction

Voice over IP hit the headlines nearly five years ago when some consumers used the internet to make mostly international calls, bypassing international call charges. But the sound quality, reliability and security were significantly below what businesses required.

Now, there is renewed interest from businesses. IP networks are available that can guarantee the right Quality of Service (QoS) for voice. Even the smallest offices are accessible via IP at a reasonable cost, using broadband connections. Manufacturers have continued to improve their VoIP equipment and software, with the result that VoIP is now able to provide voice quality appropriate to business communications.

Analysts have found that the vast majority of businesses are now planning to implement – or have already implemented – VoIP services. Those that have implemented it feel positive – for example, in a survey, 71% said their productivity had improved (see page 3).

IP telephony is another term used in this area. The main benefit of IP telephony is that it provides access to multimedia features, such as presence, hotdesking, video telephony, whiteboarding, and XML applications.

Zeus Kerravala, Vice President, The Yankee Group, said, 'An increase in mobile workers, a desire to deliver productivity-enhancing tools that can leverage the communications infrastructure, and a mandate to do more with less have made IP telephony necessary for businesses to remain competitive.'

## What is VoIP?

VoIP pretty much does what it says: voice calls are broken down into data packets and routed over an IP network. All the packets must be reassembled in the correct order and virtually instantaneously, unlike other sorts of IP traffic – for example email packets don't have to arrive immediately and they can be reassembled as the packets arrive. Voice is highly sensitive to latency (delay) across the network, so this has to be tightly controlled – in other words, it requires a stringent QoS.

VoIP is a generic concept. The packets can be delivered in several different ways, such as via the internet, via gateways, over broadband or over dedicated networks. Each of these has different pros and cons. There is also a wide variety of management levels available, from do-it-yourself services to fully managed IP telephony services from service providers.

Today's networks use technologies such as multi-protocol label switching (MPLS) to prioritise traffic across the network. They enable the necessary QoS to be provided across more or less any wide-area connection – including broadband digital subscriber line (DSL) links. Internally, Ethernet local area networks (LANs) are now more than able to support VoIP.

### What does it mean?

VoIP specifically refers to sending voice traffic over an Internet protocol (IP) network. In the case of COLT services, this IP network comprises the customer's local area network (LAN), as well as the COLT European network. With VoIP, the end-points may be traditional telephones or IP telephones. Non-IP devices are used to originate and terminate calls – this is sometimes called IP trunking.

IP telephony refers to VoIP made using IP telephones (and soft phones) and IP PBXs, which are software-driven switches that perform a local exchange function.

A desire to deliver productivity-enhancing tools and a mandate to do more with less have made IP telephony necessary for businesses to remain competitive.

Organisations wishing to move to VoIP will need to upgrade or replace their existing private branch exchange (PBX) – the equipment that routes voice calls through an office building. Some may adopt an IP PBX. This allows customers to set up a service that is the most feature-rich and bespoke for their needs. The downside of an IP PBX is that it can require a significant capital investment and unlike their TDM predecessors.

An alternative approach is a network-based service providing PBX functionality from a carrier's network. There is no need for PBX equipment at the customer's premises. Phone calls are carried as data, routed over the LAN to a company's IP phones. This approach effectively outsources to the carrier both the CPE investment and the risk.

Gartner principal analyst Steve Koppman says a network-based service 'has the promise of cutting overall company costs because it can combine data and voice on the same lines, and thus reduces ongoing costs of managing multiple networks. It makes it possible to outsource telecom management.'

## Market background

This message is clearly hitting home to businesses: a survey revealed that more than 80% of business-technology executives say their companies are using, testing or planning to deploy VoIP or IP telephony (29%, 18% and 34% respectively). Of those using VoIP or IP telephony, 63% say they're going to spend more on it this year than last year<sup>1</sup>.

Network-based services are predicted to grow by more than five times over the next two years.

1. InformationWeek US survey.

## Key benefits

### Cost savings

Cost reduction is the most likely benefit, say three-quarters of those using, testing, or planning to deploy VoIP<sup>2</sup>. IP-based phone systems are typically 20% cheaper than TDM PBXs, with significant savings on calls between international offices that can now travel over the data network. On-net calls within an organisation are usually carried for free. In all, half the companies using VoIP expect a reduction in telecommunications costs this year. A quarter expect no change and only a fifth anticipate cost increases.

2. InformationWeek March 2004.

### Productivity

71% of those in the InformationWeek survey said that they had experienced improvements in productivity. Typically, these result from elimination of time wasted in taking and retrieving messages because people are easier to contact. The same capabilities, together with the ability to intelligently re-route voice calls based on caller identification, also resulted in 44% of those surveyed saying that they had seen faster responsiveness to customers.

A key advantage of VoIP is that a person's phone number is tied to them and them alone. Only when they log in does their telephone number become associated with a physical location. This means that IP voice calls are automatically routed to an employee irrespective of their physical location (so long as they are connected to the network). This includes home office locations connected to the main network via a secure IP VPN connection

The network-based approach outsources investment and risk to the carrier.

over broadband. Gartner's Koppman says: '(VoIP) is well adapted to a mobile workforce'.

Looking to the future, VoIP could take advantage of wireless LANs, so office workers could have cordless handsets to carry about, reducing the use of mobile phones in offices. 4G technology integrates fixed and mobile telephony to allow IP phones to use the cheapest available network to make a connection, using a wireless LAN in the office, a wireless hotspot in cities, or a 3G network if out of range of any LAN. These technologies are still under development, but are worth mentioning because of their potential productivity and cost-saving benefits.

### **Optimised resources**

VoIP can reduce maintenance costs as organisations have to maintain only a single converged voice/data network, rather than two separate ones. Also, the costs of moves, adds and changes (MACs) – a cumbersome process with a PSTN-based system involving physical access to the PBX – drop to almost zero with a VoIP system, since this can be done remotely, via a web-based user self-management tool, or from a single console where sophisticated features are required.

### **Support for flexible working**

Users can be reached at any location where they are connected to the corporate network, which makes hotdesking very easy. Employees simply log on to an IP phone, and voice access is automatically provided. This means the organisation can have a uniform phone system throughout, rather than a mixture of equipment at offices plus single lines for home workers, presenting a more professional appearance and ensuring the same user end experience. Employees are also less likely to use mobile phones, reducing costs.

### **Customer satisfaction**

Overall, users consider VoIP to be better than or equal to conventional voice for advanced features (93%), ease of administration (85%), total cost of ownership (83%), vendor support (83%), end-user satisfaction (81%) and QoS (69%) (InformationWeek survey).

## Implementation

Typically, organisations wishing to implement VoIP services are looking for either an immediate transition or a gradual one.

Multinational organisations and companies with greenfield sites are finding it attractive to converge voice and data traffic onto a single IP infrastructure. Early-adopter businesses may want to make a fast transition from legacy services.

Other companies are opting to exploit existing voice assets and migrate gradually towards an IP infrastructure, adding features and functionality at their own pace. IP systems can co-exist with legacy systems – known as a hybrid solution.

## Implementation strategies

Organisations implementing VoIP often choose between two different approaches; they either create their own solutions, described below as a CPE-based approach since it requires ownership of expensive physical assets, or they can take a network-based approach by opting for a carrier-managed service.

Three-quarters experienced improvements in productivity.

Network-based services are highly cost-effective.



## **CPE-based approach**

An organisation wishing to invest in the equipment necessary to provide VoIP in-house may find that it results in cost savings over time, and carries the benefits of having a bespoke service. However, the business case for this will have to be worked out carefully in order to ensure that the risks entailed are justified, as significant costs may arise during the migration phase. Considerations such as frequent software upgrades (and associated network) downtime, as well as shorter equipment lifecycles need to be taken into account when budgeting. Often small-scale pilots are not cost-effective because of the significant up-front investment in CPE.

Both start-up and upgrade costs should also be looked at carefully: it may not be cost-effective to implement more sophisticated functionality at the start of the project so the organisation concerned may choose a fairly basic service to begin with and upgrade it later. A CPE-based solution has benefits for companies that prefer to own and manage their voice infrastructure.

## **Network-based approach**

As organisations look to reduce the total cost of ownership of their communications infrastructure and increase its flexibility, work by COLT has shown clear advantages of network-based services. Businesses no longer have to invest in capital-intensive CPE, but can benefit from the flexibility to scale their infrastructure up or down as the business changes, add or remove sites and users, and roll out new features to all sites simultaneously.

This approach is a highly cost-effective alternative to CPE. The main hardware costs are the IP phones, and there are predictable monthly costs. Low capital investment makes a small pilot possible with the PSTN-based system kept in parallel use until the VoIP system has proved its value and reliability.

The approach will also be attractive to organisations that are highly focused on their core skills and do not want to operate a PBX in-house.

In the network-based approach, service providers can implement sophisticated and advanced services (such as security measures) in the network more effectively and cheaply than individual organisations could. Naturally, rigorous service level agreements should be put in place to ensure network performance.

## **Conclusion**

VoIP has now come of age, with advancements in network technology ensuring reliability and voice quality comparable to traditional PSTN systems. Acceptance of IP voice might be compared to that of wireless LANs a year ago: the early adopters are highly satisfied. Analysts agree that the VoIP market is set for enormous growth in the coming years.

The precise manner in which VoIP is implemented should be a matter for careful consideration. To the possible cost savings of an in-house solution must be added the increased risks of managing a complex and mission-critical converged network. These also need to be compared to the flexibility and scalability offered by outsourcing the VoIP network to a managed service provider.

Overall, the question for enterprises looking to implement VoIP is not 'if' but 'when?' and 'how?' COLT is ready to help you make these choices.