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## Planning and Managing Voice over IP (VoIP)

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Voice over IP, or VoIP, is a technology increasingly popular in business for its ability to run voice communication over computer networks – including the internet – and reduce costs.

### Why businesses are switching to VoIP

The major reason is to cut costs, often dramatically. It's not uncommon for rental costs to be halved moving from ISDN lines to VoIP.

The integration of business phone systems with PC applications – as users increasingly work with devices other than the traditional desk phone – is another key driver.



## The benefits of VoIP

VoIP eliminates some of the limitations of traditional telephony by replacing high cost, specialised and proprietary hardware with low cost services and commodity hardware. VoIP is far more scalable both in terms of users and locations.

Traditional telephone lines are inefficient since a pair of physical copper wires is needed for each concurrent call, and these lines are utilised only when a call is made. Since VoIP calls run on existing computer

networks, investment in broadband or leased line connections is maximised by eliminating ISDN rental charges.

VoIP also brings new features including:

- video calls and video conferencing
- high definition voice calls
- integrated collaboration tools like instant messaging and presence.

## What about Skype?

Skype is a form of VoIP that operates on PCs, tablets and mobiles over the internet. It's a peer-to-peer system that uses participating PCs to process and carry calls.

Being internet based, Skype has no network infrastructure of its own and so the cost base is cut – but this also means that the quality of calls can't be controlled.

Skype is generally seen as a service aimed at the consumer market, in particular for international video calls. As such it doesn't yet provide the range of services that businesses usually expect, for example extensions, call hold and forward and voicemail.

## Potential costs

Cost	One off or recurring	Typical amount
VoIP telephones	One-off	Typically £50-£200 per unit
Installation costs	One-off	Dependant on local network survey
End user licences	Variable	Variable by system choice
Feature charges	Variable	Variable by package
Call costs	Recurring	Mostly per-second
Connectivity; ADSL (includes line rental of landline) or leased lines.	Recurring	Variable by provider. Can often leverage existing connectivity arrangements.
SIP trunks	Recurring	Variable by package
PBX services	Recurring	Variable by package

## Potential savings

Saving	One off or recurring	Typical savings
ISDN circuits	Recurring	Line rental can typically be halved
Inter-branch call costs	Recurring	Usually un-metered (i.e. free)
Call costs	Recurring	Variable by service providers, but VoIP is almost always the same or better value than PSTN
Home working	Recurring	Contingent on the value of phones operating at home as in the office
Business continuity & disaster recovery	Recurring	Contingent on the value of being able to set up phones anywhere with an internet connection
Flexibility	Recurring	Contingent on the value of adding and removing extensions and services at will
PBX maintenance costs	Recurring	Hosted systems require no maintenance
PBX Capital Cost (avoided)	One-off	Physical PBX typically £5,000+



## Telephone numbers

Whilst we're familiar with geographic telephone numbers, with VoIP both geographic and non-geographic numbers can be delivered anywhere, by porting existing numbers to a SIP provider (SIP is a standard for voice and multimedia calls using the internet and other computer networks in place of the traditional telephone network (PSTN). In addition to the cost savings and functionality enhancements, this also provides a way for businesses to retain telephone numbers if moving offices to another area.

## Hosted services

A private branch exchange (PBX) telephone extensions within an office. It typically serves a single physical location.

Today's hosted PBX services do away with the hardware required on-site. Instead, they offload the functionality to a service provider (increasingly referred to as a cloud solution).

As a result, personnel can easily work across locations, since the hosted PBX doesn't care where a telephone is physically located, in the same way that email can be picked up anywhere.



An interesting and useful side effect of hosted VoIP services being location independent is that it considers all calls between its extensions as internal, regardless of physical location. For smaller companies, this can create the perception of a larger organisation and also means that calls between extensions are unmetered, even if they are separated by thousands of miles.

### Handset options and provisioning

A wide range of telephones are available, from £50 to £500 or more, with features and functionality designed for every use case from individual consumers to large international businesses. Soft phones - an app that runs on a PC, smartphone or tablet - are also generally available.

It is usually recommended to acquire phones from the VoIP solution provider, since some configuration is required and different handsets often have different system licensing implications.

### Network requirements

Broadband typically has more download capacity than upload, and since telephone calls need equal capacity in both directions, the lower (upstream) capacity is the limiting factor, determining how many simultaneous calls are possible. Generally, a couple of phones and PCs can be used on a standard business broadband connection, and a dedicated broadband connection should be able to support ten or more phones.

### Codecs

The actual bandwidth each concurrent call needs depends on the codec used (the method of converting voice to digital data), alternatives providing a trade-off between audio quality, bandwidth and compatibility. Calls of the same quality as a PSTN line need about 100kbps each, but that can be halved at the expense of some audio quality by using a compressed codec.

### Separating voice and data

Because speech data is real-time, normal computer-network transient conditions (such as packet loss, latency, and jitter) do impact VoIP call quality. It's therefore important for the provider to understand the nature of the network and offer robust solutions such as class-of-service prioritisation and VLANs to separate traffic types.

The final design depends on the network infrastructure already in place, security requirements, and of course budget. For larger systems, a detailed network assessment will be needed.

### SIP trunks

SIP trunks use the SIP standard to connect VoIP systems to the outside world, enabling calls to be made to and received from any other telephone.

SIP trunks can carry many simultaneous calls, making it possible to reduce costs by replacing many ISDN lines with a single internet connection.

SIP trunks are marketed in various ways by VoIP providers, from a free service associated with their telephone numbers or PBX, to a chargeable service based on the number of simultaneous calls or channels supplied. VoIP for the Sole Practitioner and Small Firm.

## Some forms of VoIP are targeted specifically at the smaller business

Hosted VoIP services for this sector are capable of providing a range of telephony services with low rental costs. In addition, numbers, extensions, services and features can be added or removed as required, usually without penalty or the need for long term contracts - and sometimes, with no contract at all.

Companies that specialise in services to small firms can be found in the Small Enterprise category on the ITSPA Awards website [www.itspaawards.org.uk](http://www.itspaawards.org.uk).

## Support, management and recovery

### Service provider support

A key benefit of hosted VoIP solutions is that service providers can offer more effective remote support, reducing costly site visits, since the major components of the system are located within their data centres. This also enables maintenance tasks such as software patches and upgrades to be undertaken more regularly and without downtime.

The service providers also generally have real-time monitoring systems to alert them to faults proactively, in contrast to traditional telephony providers who generally rely on fault reports lodged by customers.

### Online management

Many service providers have taken advantage of internet technologies to provide sophisticated online management tools or web control panels with their VoIP services. These go further than traditional PBX management tools by providing a range of real time information such as:

- itemised call records
- usage statistics
- autodials from your address books
- integration with online services such as Salesforce.com and Google Apps

Other features offer organisations better control of their telephony- such as setting up call forwarding from a web interface. A business

with multiple offices, home offices and mobile workers can generally control the complete service from a centralised online management interface.

### Disaster recovery and business continuity

VoIP can address the telephony side of Disaster Recovery and Business Continuity almost by default.

Whilst companies using both SIP and ISDN channels have the option of using one technology if the other fails, many companies moving to VoIP will completely eliminate ISDN lines and achieve redundancy with combinations of broadband connections and leased lines from different providers. Failover between such networks can then be achieved automatically.

Multiple failover is also achieved by VoIP's ability to be easily redirected. In the event of something preventing an office from working, the calls can be taken by another office.

It's usually possible for phones to be taken home and used there. Even if the worst happens and an office burns down, preconfigured phones could be shipped the same day, plugged in anywhere and work exactly as they did in the office.



## Security and compliance

### Security

Traditional PSTN calls can be intercepted by tapping the wires anywhere along their route, but intercepting VoIP calls usually requires access to either the customers' or service providers' premises. Because on-premises call interception can be avoided through network design and use of encryption, VoIP is considered to be more secure than PSTN.

However, VoIP systems, like anything else connected to the internet, are potentially vulnerable to malicious use, so it's essential to use an ITSP with robust network security such as dynamic fraud detection.

Using reputable VoIP suppliers is also essential because these companies all provide emergency services. However, it is important to note that power outages (without a UPS) and interruption of internet connectivity will prevent emergency (999) calls being made with VoIP telephones - as it will with most normal PBXs.

Where an advanced IP solution is deployed that allows users to roam and 'log in' in other buildings, it is worth consulting your supplier regarding what 999 address information is automatically presented by your network operator in an emergency call.

### Regulatory compliance

Companies that need to be FSA compliant often find that the cost of initially achieving compliance and call recording. For businesses with multiple locations, the costs of recording calls using traditional telephony is generally far higher than with a VoIP solution, since a single, centralised recording platform solution can be implemented with VoIP.

Additionally, whilst traditional recording solutions require on-site recorders and storage, VoIP providers increasingly offer on-tap per-minute call recording services, making call recording accessible to even the smallest businesses. reduce the carbon footprint associated with traditional commuting. Audio and video conferencing can also reduce the amount of business travel. In its own right, unified communications is a green technology, requiring little hardware. Softphones, for example, can replace handsets which would otherwise end up in landfill.

Similarly, unified communications is an application that can be easily deployed on the existing network – it does not require a new server or separate cabling. Software updates are simply downloaded from the internet, which further reduces carbon consumption by avoiding the use of CDs, packaging and delivery services.

## Calculating the return on investment

While the financial rationale for unified communications should be primarily based on the total cost of ownership, it is relatively quick and easy to calculate savings and therefore a return on investment.

### Savings may arise from:

#### Reduced travelling expenses

Unified communications can significantly reduce commuting and travel to meetings, saving both fuel and the cost of employee transit.

#### Reduced overheads

By facilitating remote working, office space can be minimised, which in turn will reduce costs such as rent, lighting and heating.

#### Reduced cost of audio and video conferencing

Many unified communication packages include the option of audio and video conferencing, which will eliminate the need for additional separate expenditure.

#### Reduced IT equipment costs

As previously covered, unified communications is a software-based application, which eliminates the need to buy or update expensive IT equipment and can actually replace desktop handsets. Existing IP handsets can also be integrated seamlessly into the unified communications environment.

#### Improved collaboration, productivity and decision making

Although more difficult to quantify, these benefits can deliver vital strategic outcomes including quicker problem resolution, reduced time to market, and improved customer satisfaction and knowledge sharing.

## Do's and Don'ts

### DO



Review your local network and broadband access before jumping in.

Your homework - Service providers aren't all the same. Test your service provider before committing - call their support line.

Use a VoIP provider that is a member of ITSPA and preferably one that has earned a Quality Mark certification.

### DON'T



Use VoIP if your access to the internet is poor.

Commit to long contracts

Try to cut costs on hardware and Internet access - your firm's reputation will be damaged by poor call quality.

Choose separate providers for your phones, SIP trunks and broadband. (Unless you like playing pass the parcel).





## About Telappliant

Telappliant has been delivering internet telephony solutions since 2003. It is a founding member of the Internet Telephony Service Providers Association (ITSPA) and was one of the first companies to launch VoIP services into the UK SME market.

Telappliant owns one of the largest VoIP networks in the country and through its flagship VoIP phone system, VoIPOffice Hosted, provides a reliable telephony service to more than 20,000 businesses.

VoIPOffice Hosted Professional is an IP PBX solution hosted by Telappliant 'in the cloud'. It provides low cost calls at less than 1p per minute and enables

users to enjoy the features and benefits of an advanced business telephone system but without the hardware and maintenance costs.

Telappliant also offers a range of complementary VoIP services. These include SIP trunking (VoIP 'telephone lines'), VoIP-optimised broadband, global telephone numbers and unified communications solutions.

The company is fully ISO 9001 certified and uniquely positioned to deliver state-of-the-art, integrated end-to-end solutions, with high quality business support and dedicated account management.

Get a quote for VoIPOffice,  
our cloud telephone system



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