

Guide to migrating to SIP

Whitepaper

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Session Initiation Protocol or SIP is the VoIP standard used by most telecommunications service providers as a replacement for ISDN or analogue telephony services. Often this will be transparent to the end user, in other words the end user will be using a VoIP service without realising it.

There are both cost savings and productivity benefits to be had by moving from the old circuit switched telephony world to SIP. This short guide describes the steps you need to take and things you need to look out for in making the move.

SIP Fundamentals

At the basic level a SIP phone call is no different to any other phone call although the SIP call quality can be much better. SIP is delivered either to a personal telephone handset as a Direct Dial number or as a group of lines to a phone system that allows multiple calls to be made over a "trunk".

SIP calls can be outbound to any other telephone number in the world. Inbound SIP services have their own numbers just like any other telephony service.

SIP calls are made over Internet Protocol data networks. Any network connection that can be used to connect to the internet will typically suffice. This indeed is often where the biggest cost savings are made as only one type of network is needed. The connection does need to be sized appropriately for the number of simultaneous calls to be carried and will ideally have some form of Quality of Service enabled.

SIP is an open standard and is supported by practically every network equipment vendor in the voice market. A huge amount of testing has been performed to ensure interoperability between different vendors' equipment. Phone systems today will all have a SIP interface but it is also possible to connect an old system to the new SIP network using an adapter known as a gateway.

Sizing your IP connection – best practice

There are two quality levels used for SIP calls, each requiring either roughly 50kbps (G729) or 100kbps (G711) per call. The "G" numbers refer to the compression algorithms used to encode the call. Timico normally opts for the higher quality as the standard set up, but the lower bandwidth call is perfectly usable for those after the lowest possible cost.

The type of connection used depends largely on your bandwidth requirements. Small offices requiring only a handful of lines can use a normal ADSL broadband connection. Best practice is to use a line dedicated to SIP to avoid quality problems associated with large data downloads by PCs on the Local Area Network.

The number of calls that can be made on a broadband line depend on the upload bandwidth available as this is normally smaller than the download speed. An upload of 1Mbps from a 24Mbps service (ADSL2+) would allow 10 simultaneous phone calls.

A Fibre To The Cabinet (FTTC) line with 10Mbps upload would allow 100 simultaneous phone calls. However if an office genuinely requires 100 simultaneous calls on its phone lines then reliability factors start to become important and point towards a stable fibre based Ethernet connection with perhaps a broadband backup.

Larger offices might use higher bandwidth services such as EFM or fibre delivered dedicated data circuits to support dozens or hundreds of VoIP end users. Ethernet connections, which can be delivered in speeds of up to 10Gbps (a lot of calls) can also be configured to provide Quality of Service for voice calls which means that the same connection can happily carry both voice and data traffic without degrading the former.

Set Up

Equipment set up at your premises is straightforward. A SIP line connects with the VoIP server in the same way an email client picks up email from a remote service. All that is usually needed is a username, password and server IP address from the service provider. This is true whether the line is a single channel on a telephone handset or a multi channel pipe connected to a PBX phone system.

The dial planning for the phone system will normally be the same regardless of the type of phone line being used. This normally requires someone with knowledge of the particular phone system although a self installation is not precluded.

In some scenarios both SIP and ISDN/analogue lines may be used as backups to each other. Here the choice of outbound line is normally determined by prefixing a call with a number. for example 9 for ISDN, 8 for SIP.

DR Planning

SIP is an ideal technology for coping with Disaster Recovery situations. As mentioned above it can be used in conjunction with another physical technology such as ISDN. However the great benefit of SIP is that it is truly location independent.

If a disaster happens at a particular office location it is very easy to redirect SIP calls to an alternative office. Moreover this is something that can be set up in advance so that the recovery from disaster is quick, if not instantaneous.

For larger locations with multiple IP connections for data resiliency it is also straightforward to implement a failover mechanism so that if one connection fails (e.g. if a digger cuts through the cable) the other kicks in seamlessly.

Porting a number

Telephone numbers can be ported between most of the main telecommunication companies in the UK, regardless of whether the existing service is VoIP or otherwise. Members of the Internet Telephony Service Providers Association (ITSPA) also agree to port numbers between each other thereby offering a fairly wide spread of options.

The system is not without its pitfalls however and some end users have been caught out having taken VoIP telephony services, and consequently numbers, with Communications Providers that have subsequently gone bust and then were not able to easily port their numbers.

It is worth checking who your ITSP of choice can port with before signing on the dotted line. The process usually takes ten working days from order acceptance and must be the subject of careful planning. You need to have all the elements of the service in place and tested before making the move.

Testing your set up and typical problems found

It is advisable to test a telephony system before using it, regardless of the technology being used. In the case of SIP this can easily be done in advance of porting the numbers, assuming this is being done. Any issues can be sorted out before the go live date.

The most common problem areas we come across when using SIP relate to connectivity issues and firewalls. The firewall problem is normally easy to fix. LAN problems can take time to trouble shoot, sometimes because the person managing the LAN is often not the same as the person managing the wide area connectivity or has limited experience with VoIP. Whether it is LAN, WAN or firewall the problems are fairly standard and there are well understood processes for resolving them.

Cost savings and other benefits

Because every business is different the cost savings and benefits vary from company to company. For example Timico customer Honda UK has been able to demonstrate 45% cost savings on voice calls and line rental by implementing SIP trunks. Honda workers are now also able to use their work telephone from any location, including their home office. By moving to VoIP, Honda has also increased the resilience of the company's telephony network and improved the support for Disaster Recovery.

Conclusion

Voice communication is one of *the* mission critical services in a business and needs the appropriate degree of focus when implementing a solution. SIP technology has been around for many years now and has become a mainstream product for the telecoms industry. Like any networking technology care needs to be taken when implementing a service but the issues likely to be encountered are well understood and unlikely to be show stoppers.

About Timico

Timico is an independent internet service provider supplying business strength communications solutions. Since being founded in 2004 Timico has consistently been one of the fastest growing privately owned companies in the UK and European Tech sector (Sunday Times/Microsoft TechTrack100 2007, 2008, 2009, 2010, Deloitte's European 500, 2009, 2010).

The company is rare amongst ISPs in that it offers the full range of fixed and managed internet services (including broadband, Fibre To The Cabinet, Ethernet, MPLS, hosting, VoIP) but is also a fully licensed mobile service provider (O2 and Vodafone). Recent investments include the acquisition in 2010 of award winning south coast ISP NewNet and Newbury based mobile applications developer HandHeld PCs.

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Trefor Davies is CTO of Timico, responsible for formulating technical strategy and the development of new products and services. An expert within the world of IP, he is a council member of both ISPA and ITSPA (of which he was a founder member), a member of the industrial panel of Bangor University Engineering Department and of UK Internet Minister (DCMS) Ed Vaizey's advisory panel for IPv6. He was also for 4 years a board member of the SIP Forum at a critical time in the development of the technology. Before joining Timico, Trefor was Assistant Vice President of NGN technology strategy at Mitel Corporation before founding online VoIP retailer ETphones.

Trefor writes a widely read industry blog at www.trefor.net where he comments on a range of technology issues. He has been very active in promoting the problem of rural access to broadband and the need for businesses to adopt IPv6. He was very heavily engaged in the debate with politicians and Copyright Holders in the run up to the passing of the Digital Economy Act and is now active in discussions with MPs and stakeholders against the notion of introducing website blocking.