SIP Connectivity
A Beyond Wires White Paper
**Introduction**

Can you ever imagine having a life without wires? No more being drawn back to a power socket, being stuck to a location or being governed by some CAT5 cabling?! In this White Paper we will look at the vital next step along the road to technologies beyond wires.

**Background**

The way in which organisations grow and expand on all sorts of factors does not always happen in a structured and logical way.

Market opportunities, demographic changes and demand fluctuations do not always follow a predictable cycle. The growth of an organisation is not always organic. M&A’s for example can mean additional locations have to be factored in, with their own existing systems, IT infrastructures, networks and connections. It is no surprise, therefore, that many organisations have network infrastructures that are far more costly, complex and less efficient than they could be.

This is a guide to a better and less wired world; one in which reducing the number of lines through centralization, and an integrated approach to your organisation’s connectivity requirements increases its ability to respond to every call and every opportunity.
**What is SIP Trunking?**

SIP (Session Initiation Protocol) Trunking connects existing PBX telephone equipment to the public-switched telephone network (PSTN) directly over the IP-based data link such as IP-VPN or Ethernet.

Since SIP trunking works with both traditional TDM PBX switches and the new generation of IP-based communications platforms, there is no need to change existing voice infrastructures or telephones.

Unlike traditional ISDN or analogue line connections, SIP trunks are not geographically tied to locations and are scalable on a per line basis. This enables organisations with multiple connections from multiple offices to consolidate their lines through SIP trunks. You can retain your existing numbers and get access to new number ranges from different area codes across the UK. SIP trunking allows you to integrate and route calls between separate locations in a more flexible and efficient manner. Dynamic failover provides additional business continuity by automatically re-routing calls in the event the normal telephone destination cannot be reached. SIP trunking also offers customers a future proof roadmap to additional multimedia services such as presence, IM, web-conferencing and video.

Effectively, all organisations need SIP trunking or, to put it another way, all organisations would be well advised to revisit their telephony arrangements from both a technical and contractual point of view as doing so will no doubt unearth savings and efficiencies that can be made!
History Snapshot

Although the first versions of VoIP began to appear in the 1980’s, SIP began its history in the 1990’s when the original protocol was co-designed by Prof Henning Schulzrinne of the University of Columbia. The university of Columbia define the SIP protocol as – “SIP, (Session Initiation Protocol), is a signalling protocol for internet conferencing, telephony, presence, events notification and Instant Messaging”

Dr Schulzrinne also co-developed the key protocols that enable VoIP and other multimedia applications. SIP trunks themselves have been around since approx. 2007, when the protocol RFC4904 appeared. This might come as a surprise to some people who are worried that SIP trunking is a “new” and therefore untrustworthy way of communicating.

Why Now?

So why has SIP trunking become such a buzzword if it has been around for some time? What makes now the right time to think about SIP, and whether your business should implement it?

Essentially it’s all down to connectivity. Traditional broadband connections are being rapidly replaced with new and improved fibre broadband services, which are more able to cope with simultaneous demands of today’s business world.

Improvements in fibre technology are such that companies are finding themselves able to take advantage of technology that they couldn’t before. As the Government commit themselves to ensuring the UK has wide access to superfast fibre broadband, the business world is benefiting in significant ways. Smaller companies can reach more customers in an increasingly diverse number of ways, and mid-sized to larger companies are finding they can make the most of powerful tools and systems, and encourage more flexible working practices whilst also preparing themselves for future growth.

Upgrading a business broadband connection to a dedicated, superfast connection often prompts companies to review their current communication infrastructure at the same time. This is the point at which a shift from ISDN to a SIP trunk model is proposed.
### SIP versus ISDN

#### Cost:

<table>
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<tr>
<th>ISDN</th>
<th>SIP</th>
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<tr>
<td>Required dedicated install costs</td>
<td>Can use existing connectivity, already planned connectivity, or dedicated at a much cheaper rate</td>
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<tr>
<td>Rental costs on average between £15-£20 p/m per channel</td>
<td>Rentals usually between £5-£10 p/m per channel</td>
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<tr>
<td>Call costs on average can be up to 25% more expensive</td>
<td>Free calls between sites connected on network including internationally</td>
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#### Scalability:

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<th>ISDN</th>
<th>SIP</th>
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<tr>
<td>ISDN2 has 2,4,6,8 Channels</td>
<td>SIP can have 1-2,000 channel on one connection</td>
</tr>
<tr>
<td>ISDN30 has 8 to 30 Channels</td>
<td>No limitations on DDI ranges</td>
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<tr>
<td>ISDN30 requires sequential DDI ranges with a maximum of 5 different ranges</td>
<td></td>
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<tr>
<td>Can only increase/decrease channels with Openreach planning. Once an ISDN30 has 30 channels a new bearer is required for additional channels</td>
<td>SIP can expand/decrease instantly</td>
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#### Flexibility:

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<th>ISDN</th>
<th>SIP</th>
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<td>Can only use local geographic pre-fix numbers from the local exchanges</td>
<td>Use any geographical &amp; international number</td>
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<td>Needs to be diverted by the network provider and can only divert main number bearer</td>
<td>Can be diverted instantly and can divert by DDI</td>
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<tr>
<td>Lead-time for ISDN installs can be 2-8 weeks</td>
<td>Can be delivered instantly</td>
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So is it secure?

You may have concerns about the safety of SIP trunks, and possible heard about instances of fraud carried out against other companies utilizing SIP trunking.

Whilst these concerns are understandable, it is worth remembering that, if SIP trunks are implemented correctly, fraud should not be an issue.

My call quality will be compromised?

This myth comes partly from the confusion between non-business VoIP applications like Skype (which runs on an open public internet platform) and business dedicated VoIP services such as SIP trunking.

There is also legacy of ISDN providing excellent call quality that makes potential users dubious about SIP and whether it can deliver the same quality.

SIP trunking uses private IP connections specifically designed to carry voice, and as such come with QOS guarantees. SIP trunks therefore can deliver the same or sometimes even better call quality than ISDN. Call quality is also dependant on the network that delivers the call if the network has any packet loss or poor jitter rates the quality of the call could be compromised.

This is why it is better to have uncontended networks in place and why SIP trunks are generally delivered via connections such as leased line or an assured connection.

NSN offers dedicated support teams to help maintain SLA’s and QOS.

It’ll cost me too much!

Upgrading to SIP trunks should have the exact opposite effect, in that it could save you money in quite a significant manner.

You’ll save the most noticeable when it comes to no longer paying ISDN rental line costs. Additionally, you’ll have access to lower call rates or in some cases, free calls to UK destinations or mobiles, depending on the promotion. Some SIP providers talk of typical savings of 50% on line rentals, and 25% on calls. Calls between connected sites are also free, even those that are international calls.

SIP trunking has the added benefit of allowing you to avoid expensive call-forwarding costs in the event of disaster or relocation.
SIP is new and not to be trusted?

As mentioned SIP has been around since the mid 1990’s. SIP trunks have had a presence since around 2007, so the technology has been in use for some time.

Whilst perhaps it is too early to call it a mature service and although carriers are still evolving their provisioning and support services when it comes to delivering SIP, it is safe to say there is a substantial body of expertise around the marketplace today, and that the technology has been well tested to date.

Migrating will be a hassle!

Deploying SIP trunks is an arguably easier process than with ISDN, as long as you have a good plan in place before you start your project. NSN can help assist you here.
SIP trunking will just complicate everything.

If anything, the reason businesses like SIP so much is that it really helps when it comes to rationalizing and streamlining telephony. You can converge voice, media and internet in one go, and rationalize the number of ISDN’s and PBX’s you need. This is particularly useful for companies operating on a multi-site basis.

There will always be doubts about the different technologies, especially when your previous solution has always served you well. However, it is true that the business world is in a constant state of evolution. Whilst traditional communications types such as ISDN might have fulfilled your objectives several years ago, at some point the needs of your business will surpass the capabilities of your current solution. This is why SIP is being embraced so widely – it is flexible, adaptive and easy to mould to any business scenario.

Conclusion

It is true that SIP is not for everyone. It is also true, despite the current market hype, that ISDN is not yet redundant. In some cases, companies choose to marry SIP trunking with their legacy ISDN as a dual solution, proving that is possible to test the capabilities of SIP whilst not yet letting go of an ISDN service that has performed traditionally well.

This flexibility is what defines SIP trunkings well. It means that a huge opportunity exists for companies to take advantage of a means of business communications that is extremely adaptable to the most business scenarios.

The benefits are many, and the process of migration itself is straightforward. SIP can now also be leveraged by adopting Cloud based Telephone systems that whose infrastructure is delivered via SIP and other off premises technologies meaning that the customers own infrastructure is increasingly delivered as a service (IAAS).

Perhaps the most important thing to conclude with, however, is that there are now many SIP trunk providers out there, looking to capitalize on this growing industry. As with most moving across to SIP provider should be chosen with care to ensure that your experience with moving across to SIP is hassle free. We hope that this white paper will help you in this selection with NSN.

References used: KCom (www.kcom.com) & Solution IP (www.solutionip.co.uk)