



SIP TRUNKING

W H I T E P A P E R



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WHAT IS SIP TRUNKING?

SIP stands for Session Initiation Protocol. It enables different technologies and systems to communicate with each other simply via a common standard.

This protocol is used to control multimedia communication sessions such as video and voice over Internet Protocol, or IP networks. It is an IP signalling architecture that controls the exchange between two devices to initiate and terminate communications.

SIP

THE BENEFITS. THE REALITY. THE IMPLEMENTATION.

The Maturity of SIP Technology, the Implications and Reality for your Business

Whilst SIP (Session Initiation Protocol) is not new it has emerged over recent years as the universal standard for “open” VoIP communications!

Today most people are familiar with VoIP (Voice over Internet Protocol) or IP Telephony, which gave way to converged systems (voice and data on a single network infrastructure), simplified management, faster deployment, easier networking (incorporating satellite offices and homeworkers and of course new wave applications and ways of working, such as Unified Communications (UC). The premise of UC is an integrated suite of communications channels (voice, video, data, web, text) over a single VoIP protocol, that of SIP.

SIP provides more options than ever before for your telephony network, system interoperability, ease of use and context aware communications across a wide range of devices, with simple indicators for presence and availability. SIP provides the mechanism for improved communications, blending traditionally separate worlds and can do it with greater flexibility and more cost effectively than ever before.

One application for SIP that has emerged is that of SIP Trunks, providing high capacity phone line connections. The beauty of SIP is that it is inherently more flexible than analogue and digital lines, it is quicker to set up, can provide much higher capacity than traditional lines and can flex in-line with business requirements. Added to that, it is possible to create a centralised pool of lines that can be shared across a distributed enterprise, providing more effective resource allocation, cost savings and comprehensive options for DR / Business Continuity Management.

The adoption of SIP trunks are growing at over 60% year on year and with over 20% of all active lines now based upon SIP, SIP has become a mainstream technology and is a strong proposition for organisations of all sizes.

This white paper will explain what SIP is, its advantages and then raise some considerations for your business before switching to SIP infrastructure.

Voice over the Network

SIP is the treatment of voice information as packets of data to be sent over the internet or private networks, rather than the traditional use of specific telephone infrastructure such as PSTN gateways and ISDN Basic Rate Interfaces. Through this process it negates the need for expensive hardware inherent with ISDN connections and due to the increased number of calls possible over a single data connection. The great thing is the scaling of lines / resource does not require additional hardware as was the case with ISDN, nor does it require the long lead times associated with ISDN connection – or associated contract inflexibility. SIP also enables further services to be delivered and is quick and simple to control. Here at Britannic we operate our own SIP exchange platform with multiple direct connections into BT and other major carriers, capable of delivering a broad range of technologies as well as carrier grade voice quality services.

The History

Developed in 1996, SIP has now become a ratified standard, overseen by the Internet Engineering Task Force and supported widely by numerous vendors and network operators globally.

SIP was originally engineered to control individual IP communication sessions, but with the introduction of SIP trunking it can now govern multiple simultaneous sessions. SIP Trunking sets up virtual IP channels over an IP connection for the flow of information and maximise network efficiency.

Britannic Technologies have been providing SIP trunks since 2004 and today we route many millions of calls through our resilient carrier platform. We initially routed customers through our own technology gateway / SBC (Session Border Controller - BriPORTAL). This provided SIP trunking on legacy systems and more latterly we have introduced directly connected SIP trunks into netX, our SIP exchange.

Britannic Technologies were the first to market with a SIP offering in the UK. We know this because we spoke with all major carriers but none had a market ready SIP offering, so we set about building one ourselves. We found one of the worlds’ largest carriers who were prepared to make changes to their network to support our innovative approach enabling us to release our offering to market.

Configuration

Configuring a SIP service is usually fairly simple and involves the provider's network operations centre to remotely configure the customer's SIP Trunk group allowing the service provider to communicate with the customer's IP PBX. Britannic Technologies has a first class Network Operations Centre and our own development team, enabling us to integrate into any system and provide you with round the clock support and management.

SIP works across any IP network and Britannic offer a range of connectivity options from Private DSL through to Ethernet networks to ensure the quality of the delivery. Once a SIP Trunk is established, it will integrate natively to most modern phone systems and deliver calls with a high level of control. Interconnections between the Service Provider's network and the PSTN will enable calls to flow simply and efficiently across the SIP Trunk, whether using a traditional line or mobile phone.

SIP can be configured to then support the number of call paths that the customer needs and the bandwidth available to adequately support those call volumes.

SIP Telephone Numbers

Like traditional connections (ISDN & PSTN) telephone numbers are set up on the SIP trunks. New DDIs (Direct Dial Inwards) numbers can be provided on the SIP trunks with much more flexibility than that of traditional connections.

Existing telephone numbers can be ported from the PSTN network to the SIP network. This is a paper exercise to ensure the registration is managed and moved from the old network to the new network converting traditional numbers into SIP numbers.

There are a number of scenarios that are a little more complicated than others, however Britannic has worked with OFCOM and the Number Portability Group to set up new practices within the industry to accommodate the more complicated scenarios when porting numbers between range holders (carriers). Not only has Britannic addressed the complexity of porting into their platform (connected to the BT IP platform – IPX), they have also made provision for managing the porting out of their SIP platform back to BT – should this ever be required, thereby not locking in numbers as some other providers have done!

SIP numbers provide a great deal of flexibility when it comes to Business Continuity as they can be "pointed" at different destinations (as is the case with non-geographic telephone numbers, such as 0800, 0845, 0870, 03 and so on), ensuring that in the event of a failure / loss of connection or site, the calls can be re-routed to alternative destinations, either automatically or ad-hoc, as required. SIP numbers are also portable so if you are moving location, or indeed want a virtual presence within a particular location you can do so, without having to have physical equipment or exchange connections.

THE ADVANTAGES OF SIP

Why are so many organisations making the switch to SIP? There are several excellent reasons

Flexibility

SIP Trunks are extremely flexible and configurable to business requirements and are often configurable almost instantly. When you compare this to traditional infrastructure and the complications involved and combine it with the pace of modern business, cost savings and Business Continuity controls, SIP becomes a no brainer.

Simpler Infrastructure

Traditional infrastructure, such as ISDN, locks customers into 30 line bundles with a minimum 8 lines, irrespective of how many were actually being used. For instance if an organisation had 30 active lines, but needed to add another 2 they would have to buy a new ISDN bearer, which is not a cost effective option. In direct contrast SIP Trunking can enable fully tailored propositions for organisations, matching usage and requirements with incremental scaling as required and at a fraction of the cost! Britannic have implemented award winning solutions for organisations based on SIP, providing as much as a 50% cost saving on their telecoms bill, whilst providing more functionality and services – supporting that call of more for less.

When adding call paths to the network, SIP Trunking comes out on top too. To expand the line count customers simply purchase additional paths and the service provider configures the connections – provided of course that the bandwidth can support the extra allocation. As mentioned previously, here at Britannic that process can be almost instantaneous.

In addition to these more flexible offerings, SIP also saves customers money by requiring less telephony hardware. Traditional PRI will require one (or more) expensive cards in the PBX requiring installation on site by a technician and on-going maintenance.

Delivery

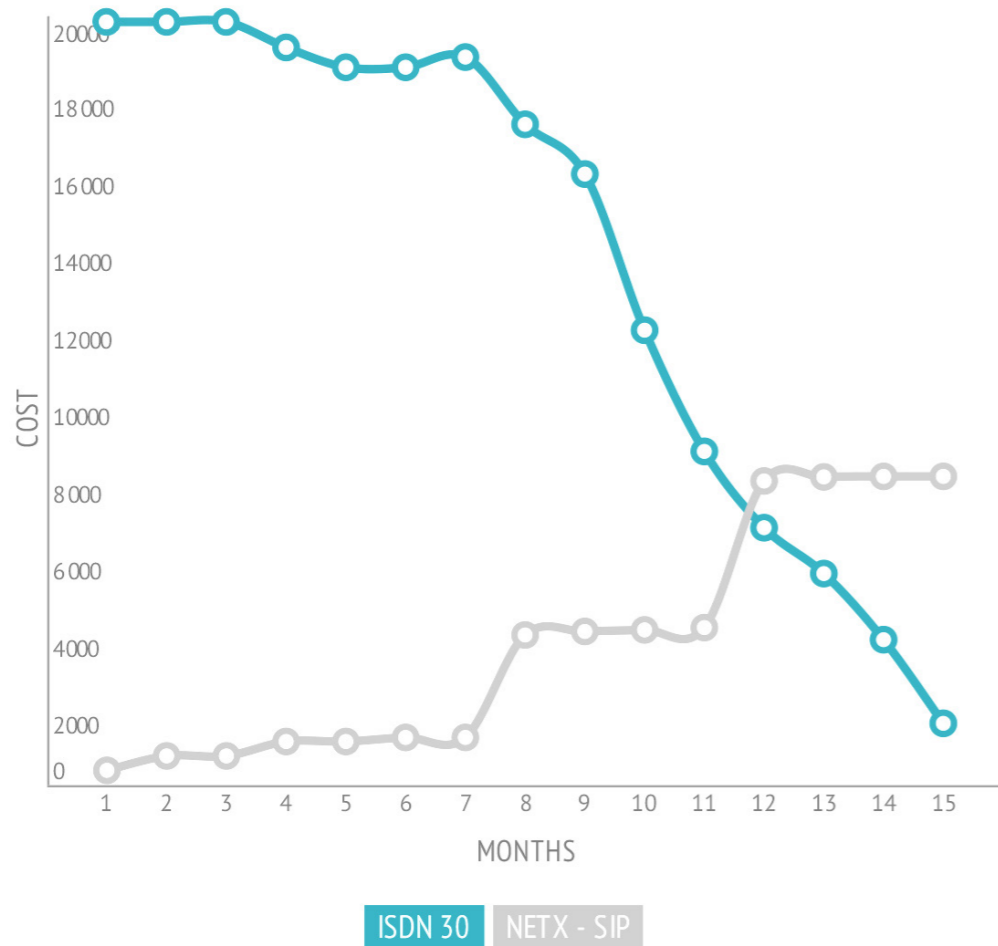
SIP Trunking is traditionally delivered via a standard Ethernet connection and can be plugged straight into the IP PBX. All IP PBXs will have an Ethernet connection port for no additional charge. Additional Trunks can then be configured without the need for a technician, saving time and money.

There are some hardware requirements and software compatibility requirements for SIP. For instance the corporate firewalls will need to be made "SIP-Aware" and customers using a traditional PBX will need a gateway (or integrated access device) to provide the IP-to-switched-TDM signal translation between the Trunk and the PBX. Also with SIP Trunking standards being a recent development in the market there will need to be some checking into interoperability between the provider's phone system platform and the customer's IP PBX and software release to validate services to work as expected.

Cost Saving

SIP will enable you to save money, be more flexible around telephone lines with scale up and scale down options and implement resilience, to support your business continuity plans.

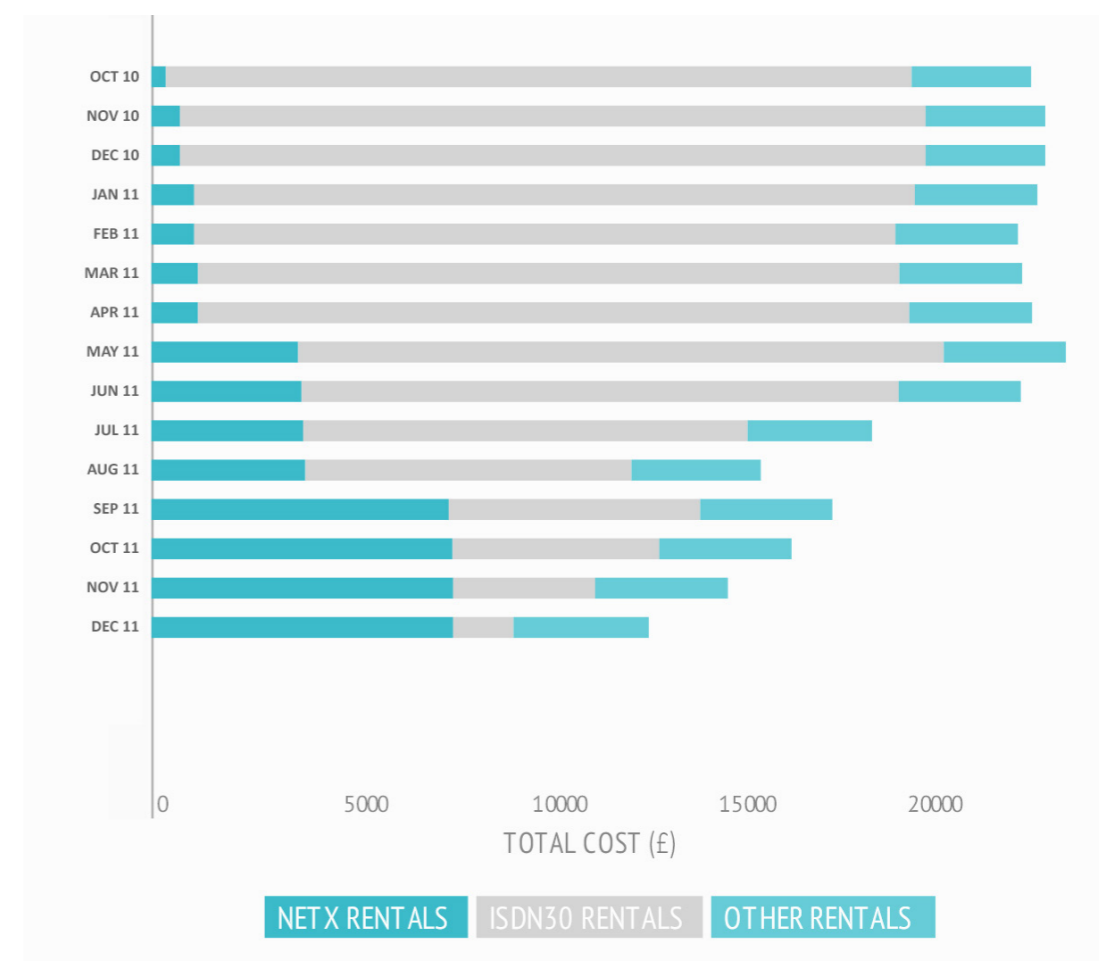
The advantage that we have here at Britannic Technologies is that it is our own SIP platform. When our customers need things changing, either more SIP trunks or extra DDIs, we can do it almost instantly providing our customers with fantastic flexibility and almost real time control. We also have a range of value added integration capabilities and applications that sit on top of our platform. This includes cloud based IVR, routing and PCI suppression of card details meeting compliance requirements.



These charts show the cost savings achieved during a phased migration from ISDN to SIP.

Added Benefits

SIP Trunking also offers its users some added applications that become available through IP infrastructure. Businesses can more readily layer in Unified Communications, Video Conferencing and Collaboration solutions, all of which can be integrated directly with the SIP Trunking service. It also allows for mobile integration and communications, distributing calls simply between offices, mobile phones and home phones - sharing features such as voicemail across all platforms. The core of our business is in providing these services with a view to longevity, simplicity and ultimately growth. Understanding the nature of your requirements as a business both immediately and progressing into the future is an important aspect of any installation, and something that underpins the foundation of our work as a consultative partner, rather than just a “reseller”.



Britannic provide the cost savings of SIP – for example a typical line rental charge for SIP could be £5, compared to £13-£15 per month for ISDN – and we also deliver savings on call charges. What we have seen through experience is the opportunity to centralise the telephone lines within SIP and achieve a much more efficient model for telephone call routing. A customer of ours was able to reduce the number of telephone lines within their business from 1400 to around 500 which resulted in over £150k savings per annum in rental charges alone.

Business Continuity

As part of the Britannic platform we are able to provide automatic business continuity call routing plans, which means that you never need to lose a call again. Additionally, because we have been providing SIP for so long our platform delivers great quality and additional functionality, for example:

- Exchange level intelligent routing based upon the number from which people are calling from
- Cloud based PCI that meets and exceeds the requirements of credit and debit card payments taking PCI out of the scope of your systems
- Cloud IVR providing queuing and automated routing and interaction with databases
- Integration with Microsoft Lync to provide SIP trunks into Lync allowing customers to use Microsoft Lync as a voice platform, or indeed integrate with existing PBX systems as required
- Port existing numbers into SIP to retain numbers and control
- A flexible and customisable billing platform supporting consolidated billing and cost centre codes

So with all of the benefits the SIP brings why isn't everyone adopting this technology? Well let's examine a few concerns.



CONSIDERATIONS

Adopting a SIP trunking service is not a simple process. A vast array of choices and decisions must be met on pricing, service, capacity, SLAs, and more. That is in addition to selecting the equipment required – the IP PBX, session border controllers and sizing the SIP Trunking implementation correctly.

There are a lot of questions that need to be reviewed to ensure that the decision being made is the right one. It isn't surprising that many organisations require support and guidance. There are some critical considerations of migrating to SIP Trunks, most importantly understanding current call activity and volumes across your existing VoIP environment. We undertake a thorough analysis of our customers' networks and capacities, discuss options and recommend what we believe is the best way forward and why.

The positive note with the development of technology is that organisations are now in a position to better understand and analyse their environments and make more informed decisions. The tools exist to provide valuable information that will position them well to design and negotiate rates, contract and service level agreements with carriers and service providers to achieve best value. We pride ourselves as being a customer focused organisation, and we work in a consultative approach with a great team of highly experienced and qualified staff. We undertake thorough analysis of all aspects of the system and discuss the best course of action for your business, involving you every step of the way. Our SIP exchange currently sits across multiple data centres with multiple connections into tier 1 carriers including BT, Level3 and Verizon. Built with business continuity in mind it has been constructed to a highly resilient and available platform enabling us to work to five 9s SLA guarantees.

Capacity

Understand just how much of your network you are using. Take the guesswork out and know your environment before you change it.

One thing that Britannic Technologies has discovered is that businesses are wasting enormous amounts of time and money on legacy PRI systems and over capacity of lines / trunks. Collect some information from your network over the course of a day/week/month and you should easily be able to see the spare capacity you have that you are paying for and not using, especially across a distributed organisation!

Is the network ready?

SIP Trunking implementations raise dependency on the WAN to carry real-time voice traffic as well as all the data. There is an element of risk in doing this, however at Britannic we would not advise any customer to route their traffic over the network if the analysis showed that it simply wouldn't be able to provide a great service in doing so.

We work with customers to review existing networks and confirming whether they are SIP ready, or if not what is required to implement SIP. We will also advise on how best to set up the network and necessary class of service to support business grade voice, supported with a great range of monitoring and network optimisation applications.

There are a number of ways in connecting into our SIP exchange. We provide next generation connections to customers, which are automatically connected to our SIP platform. We also deliver SIP into existing network / data centre environments, either through data centre / network interconnections, direct connections, IP VPN's or via the open forum LINX (London InterNet eXchange).

Security

The security and integrity of any telephony system is a critical element of any solution. Phone Systems were connected to each other before Computer Systems and IP were invented and so they have always been target of hackers and malicious users. SIP does not change this, but it allows telephone systems to be further secured through IT practices.

Britannic have built into netX nearly 30 years of experience of securing communication systems through both IT and Telephony principles. Our approach to security is multileveled and follows best practice.

To enhance the security built into the implementation of the netX SIP, we also extended a comprehensive portfolio of private connectivity options to enable systems to be connected directly to netX without traversing public networks. Although we support encrypted connections across the internet, your systems can more preferably be directly connected via Ethernet over Fibre, Copper lines and Radio, Private DSL and FTTC options.

This approach enables Britannic to offer guaranteed SLAs for service uptime, quality of calls and a confidence that your call traffic will not travelling across public networks.

Monitoring Flows

By monitoring availability, capacity and call volumes you will have a good insight into the flows in and out of your infrastructure and plan for any network upgrades, or consolidation that may be required.

Understanding the number of active calls across the network will allow you to establish the number of lines that you need. Not everyone uses the phone at the same time. If you operate a call centre then you may require a higher ratio of lines to employees to cover queues etc. - however it is very rare that an organisation will need one line per person.

There is potential to conduct pattern analysis to establish trends and determine the calls offered and carried, and if there were any queuing overflows.

All this information is even more useful when establishing busy periods (or the busy hour) and ensuring that the system is configured to adequately handle these bursts of activity.

Quality

This has been the traditional stumbling block of SIP implementation. Once all the information and data is being transferred across the network, will the quality of service suffer? Will the quality of the calls be as good? We are so confident of the quality of our service that we encourage customers to test the technology through pilots and proof of concepts. Everyone who has undertaken a pilot has gone onto roll out the technology.

Real time, historical online data and custom reports provide very useful statistics to understand call quality prior to SIP Trunking. Real time displays and historical reports will help you uncover patterns of unacceptable voice quality and narrow problems to phones, regions, locations and route patterns, or even just time of day. With this data it is then easy to correlate, diagnose and fix network performance issues that could result in sub-standard voice communications.

Britannic Technologies also monitor call quality and network capacity pro-actively with our network management centre, and as such will more often than not alert our customers to areas where a sub-standard quality in calls could result and recommend changes accordingly.

Managing the transition from ISDN to SIP

Britannic recognise that any change needs to be well managed. Consequently their team of Prince2 practitioners are well versed in successfully managing the detail of migration projects, including; number porting, SIP registration, system configuration, capacity planning and the physical switch over process all supported with clear documentation, plans, communication and suitable testing.

Reporting

Gathering all the information that you can from your environment will help prepare you fully for the transition to SIP. When considering the switch you should be able to analyse the voice quality, the service levels, capacity requirements, and have a detailed analytical tracking of call failures and types to aid not only yourselves, but your potential providers working with you to implement SIP. Britannic's network operations centre can provide you with all the information that you require enabling you to make excellent decisions for your network for the future.

Inter-operability Issues

As mentioned previously, it is only recently that standards have been introduced with SIP, so you must check and understand that all elements (IP PBX, SIP Trunk, Border Device) are compatible in order to complete voice calls.

Least Cost Routing

SIP can allow your organisation to reduce calling costs even further compared to traditional Least Cost Routing services, including greater control over call breakout options. It is the process by which an organisation chooses the path of outbound communication by the price of the call, opting for the lowest price available. It can be based on geographic locations and time zones and each call can be routed to the cheapest provider – this can save a considerable amount of money on international calls.

Service Validation

Once SIP is deployed it is imperative that you keep track of the service you are receiving and make sure that you get everything that you have signed up for. If you have real time and historical data available you can see details of quality of service, availability, capacity usage, throughput and performance. Britannic's commitment to all of our customers is transparency and honesty and we don't make promises we can't keep. We consult with our customers so they are fully aware of all the service levels that they can expect to receive.

Border Control

Although border controllers maintain connection logs, you don't want to open them each time for analysis when you need information. Management should be able to do this for you in real time enabling you to see at a glance details of available sessions, broken down into inbound and outbound, as well as the burst rate and latency metrics.

Multi-Vendor Integration

As SIP provides enterprises options for integration and unified communications solutions, potentially creating multi-vendor environments, it becomes ever more important to have a good management system in place. Successful SIP Trunking reduces costs but with the introduction of other technologies it can become a complicated system to manage, especially if there are many moving parts.

Britannic Technologies offer SIP as part of a managed service and as such can provide all the unified communications tools that you can need and manage them. This means that with just a single point of contact, and a single bill, you can have all the unified communications infrastructure delivered in a simple to manage and control package.

ABOUT BRITANNIC

We are multi award winning specialists in IP communications, systems integration and managed services, with approaching three decades worth of experience - built upon a philosophy of technical excellence, quality, innovation, predictable delivery and excellent customer service.

We were founded in 1984 and have a reputation for delivering high quality solutions and services, complemented with our ability to innovate. This includes our fully integrated end to end cloud service models and services, which can be blended with existing systems and operations, or delivered as a fully managed contract with simple cost per user per month framework agreements.

Our mission is to work in partnership with our customers, ensuring that our technology and services accurately support business requirements, customer expectations and enable future business strategy and vision.

We have developed our position within the fast evolving ICT market by partnering with world leading manufacturers, software and infrastructure providers complemented with our blend of innovative cloud applications, services and middleware applications. This enables us to provide our customers with tailor-made solutions to meet their specific business requirements with appropriate and agile roadmaps for the future. We invest the time in truly getting to know our customers so that we may give intelligent and considered advice, solutions and support.

We directly support over 800 organisations across the depth and breadth of the UK and many countries worldwide, across the public and private sector affording us a wealth of experience and best practice. Customers include organisations such as Trailfinders, Endemol, ISS, Baker Tilly, CNBC, Autowindscreens, Detica BAE Systems, CIPD, Mears plc, Ince & Co and Foster & Partners, to name but a few.

We are well versed in managing complex technology migration programs and strategies – including diverse technologies and supply chains. We adhere to best practice methodologies such as Prince 2 project management.

Our customer first philosophy is central to what we do and we have invested heavily in our service delivery, managed services and people, enabling us to provide complimentary resource to augment our customers' teams and add real value.

We are committed to keeping pace with the evolving market place and continuously improving the products and services we offer our customers. We have a vision to succeed through partnership with our customers, suppliers and staff - exceeding expectations - and to meet future market requirements through innovation, development, investment, best practice, quality and flexibility.

We provide high quality customer service with comprehensive SLA's (Service Level Agreements), monthly service reviews supported by service delivery managers. Our customer satisfaction experience is very important to us, currently running at 97%.

Our customers benefit from comprehensive SLA's, customisable billing, proactive and intelligent reporting tools and web based management interfaces, 24x7 support via a dedicated NOC and access to an excellent multi-faceted, highly skilled and experienced team of professionals who work hand in hand in partnership with our customers for mutual benefit.



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