

SPRING 2018

Next Generation Switch – latest upgrade to Spitfire’s network

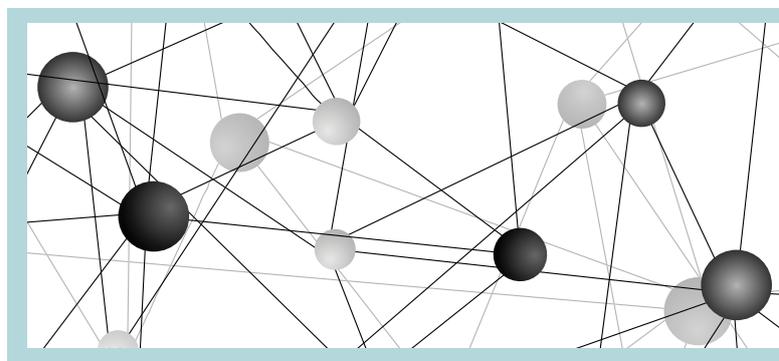
by **Graham Lewis**, *Director IP Engineering*

Spitfire has completed the refresh of its PSTN network with a new platform dubbed the Next Generation Switch (NGN).

Spitfire has been offering voice services using its own telephone exchange equipment since 2001 when we became what was known then as an Annex 2 interconnected operator.

Our old TDM network served us well but configuration limitations were becoming apparent and it was less reliable, with spare parts harder to obtain. We hoped that the old switches would last until TDM interconnect had been replaced by an all SIP national interconnect, however like much of the rest of the World, the UK still relies on TDM switching based on the SS7 protocol between carriers. We started the search for a new PSTN Exchange switch type in 2015. However, we found that replacement options were either using obsolete technologies or locked us into a vendor’s complete ecosystem. Consequently, we began work on building our own Next Generation Switch based upon our many years of experience of systems development.

The Spitfire NGS has been developed in-house using



open source software to perform basic telephony functions with Spitfire creating its own proprietary switching, routing and control software code. In the new network we have reduced proprietary hardware and software to the absolute minimum necessary, preferring to have control over as much of the software as possible.

PSTN interconnect is a regulated environment and connecting a new PSTN switch type to the BT network in the UK requires a series of approvals. Extensive interoperability testing with BT began in January 2017 and took several months to complete to ensure that the new switch type and proprietary gateways met the detailed regulatory requirements of Ofcom and technical requirements of the NICC.

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VDSL FOR VOIP



Foreword – Harry Bowlby

In this issue we have written on the launch of our Next Generation Switch network, an enhanced Core Network call divert facility, the appointment of Dominic Norton as Engineering Solutions Director and Nick Goodenough as Partner Service Director, the pitfalls of using VDSL for Voice and the corresponding launch of FTTC Ethernet and TalkTalk Ethernet. All of which have a common theme that they reflect our ongoing commitment to providing our customers and partners with the

best engineered, robust, complete and cost effective solutions to their network needs.

After making the decision in 2014 that we wanted to have a customer account management team that could deliver the best technical solutions and customer service in the industry, we have taken our whole sales team through both the Cisco CCENT examination and an extensive practical training program on IP Engineering. All senior members of the sales team including Dominic, Nick and myself are now studying for the Cisco CCNA Switching and Routing exam, which will be followed by further practical training and customer case studies on Quality of Service, MPLS and Security. We are also developing our technical sales methodology CANN, which stands for Customer Applications' Network Needs and reflects our philosophy that the purpose of a network is entirely to enable our customers' data and voice applications to communicate between disparate physical locations.

2018 is going to be a challenging, but exciting year, when we will continue to provide you with not only an industry leading portfolio of 'products' but also the engineering expertise and customer service to ensure that you receive the best attainable complete solution.

Harry Bowlby, Joint Managing Director



...continued **Next Generation Switch**

Testing manuals and specification documents several inches thick were poured over for weeks at a time as testing progressed.

After the interoperability testing was completed, a phased programme to bring the new exchanges into service whilst maintaining compatibility with the existing system was implemented. Extensive testing with BT was required as each new switch and set of routes were brought into service. The rollout project took place over the summer of 2017 with the final connections swapped over at the end of September.

The Spitfire NGS overcomes the limitations of our old platform and allows us to introduce new services. In particular the flexibility to configure customer diverts is greatly enhanced and we will soon be offering the option to configure diverts

through the customer portal.

Resilience of the Spitfire voice service is provided by deploying four separate NGS exchanges spread across two geographic locations with each NGS connecting to multiple BT POPs. Diverse IP paths have been created for SIP to TDM traffic and power to each NGS is taken from separate feeds. NGS allows us to now offer fully resilient SIP trunks that allow for automatic failovers and more complex disaster recovery scenarios.

The creation of the Next Generation Switch is a landmark in Spitfire's history, seeing us going from a switchless reseller in 1999, an interconnected operator in 2001, through to 2017 where we have developed our own switching solutions for the benefit of our customers and partners.

Appointment of New Directors



With effect from 1 November 2017 our two sales managers, Dominic Norton and Nick Goodenough have been appointed to the Board of Spitfire Network Services Ltd.

Nick Goodenough continues to manage our Partner Service team with the title of Partner Service Director. Dominic Norton will continue to manage our Direct Sales team with the title of Engineering Solutions Director. Dominic's job title reflects our commitment to deliver a complete IP Engineering solution for customers that meets the network needs of their operational objectives and computer applications.

These appointments reflect the substantial contribution that Dominic and Nick have made to the development of the business.

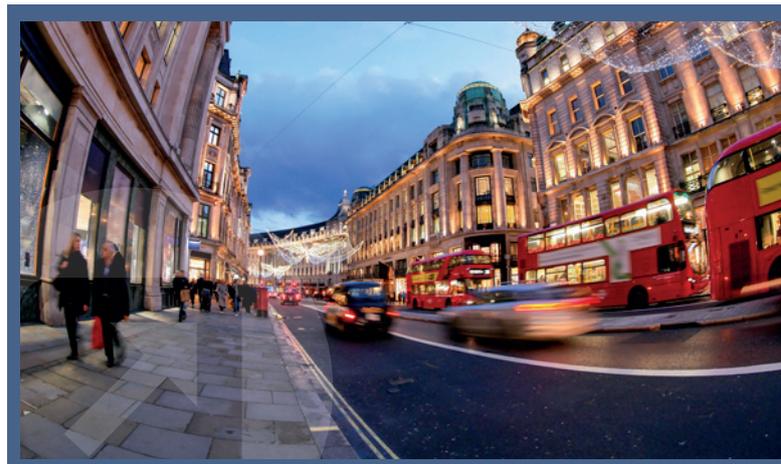
Connect Westminster Scheme – Spitfire, a registered supplier

Our customers in London's Westminster and West End areas will be pleased to know that Spitfire has registered for the Connect Westminster Scheme which runs until 31 March 2019. Westminster City Council has secured £2.8 million from the European Regional Development Fund for delivery of the scheme, which aims to connect SMEs within Westminster and the West End Partnership area to gigabit capable internet connections. The Council sees the provision of future-proof internet connectivity as being essential to breaking down barriers to business growth.

The funding will enable small to medium sized enterprises to receive up to £2,000 towards the capital cost of their connections. All connections must deliver speeds of at least 30Mb/s but have the capability of being configured to deliver gigabit speeds. In addition, connections in the scheme must deliver at least double the speed, when compared to the current business-grade connection being provided.

To support the delivery of the scheme the council is running a supplier registration process to provide vouchers under the scheme and Spitfire has been accepted into the registered supplier group.

Businesses can apply for vouchers at the Business Westminster website: www.businesswestminster.com The offer expires in March 2019 and is subject to availability.



As part of the scheme we provide customers with free connection on a one year term, or a free router, with any spare funding put towards excess construction charges, wayleave and so on. This will significantly help with the uptake of fibre Ethernet to SMEs in Westminster and the West End, by eliminating upfront costs which are the main barrier to entry.



TalkTalk Business Ethernet added to our portfolio

Spitfire is now offering TalkTalk Business Ethernet. This addition to our portfolio means customers have an even greater choice of network and pricing options.



Spitfire already supplies Ethernet from BT Wholesale, Colt, and Virgin Media Business. Spitfire's portfolio of Ethernet services includes delivery via fibre, EFM and GEA/FTTC enabling the company to offer the most appropriate solution for each customer.

Greater customer demand for high-speed Ethernet connectivity is being driven by the migration of applications and data storage to the cloud. This accelerating trend is being powered by Google Apps, AWS, Microsoft Azure and other cloud based services.

For Spitfire, Justin Orde, Joint Managing Director commented, "Our new supplier agreement with TalkTalk Business means Spitfire really can offer customers the best circuit at the best price. We aim to provide customers with the right network connectivity solution for their business needs and not a 'one size fits all' product. Increasing demand for high speed bandwidth means we need to offer customers prompt implementation and flexible pricing options."

Call diverts

The replacement of our TDM voice interconnect platform with a network of new Next Generation Switches allows us to offer improved call divert services for UK Geographic and non-Geographic numbers.

In addition all SIP trunk numbers can now have diverts and divert on failure to ISDN and mobiles. This enables SIP trunk customers to have automatic failover in the event of failure of the SIP service or their PBX.

We will shortly be offering customers and partners the capability to control their own diverts through the customer portal.



Game-changing FTTC Ethernet for £99PM

We recently announced the launch of a ground breaking FTTC (Fibre to the Cabinet) Ethernet service with full Quality of Service (QoS) SLAs for VoIP for only £99 a month. The new offering is intended to bridge the gap between basic broadband and pure fibre Ethernet circuits, which can sometimes be difficult to cost-justify for SME customers.

As the new FTTC service can support both voice and data connectivity, it can replace two broadband circuits used separately for voice and data, making it an extremely price competitive and future-safe alternative for customers. The service SLAs mean that the new FTTC offering can be used both for voice applications such as hosted telephony and high-speed data connectivity with full confidence.

Spitfire also offers a range of competitively priced backup solutions to ensure resilience and business continuity.

Commenting on the solution Dominic Norton, Engineering Solutions Director for Spitfire said, "Our new FTTC offering is a game-changer for the market, making high-speed Ethernet affordable for SMEs for the first time. The SLAs with the service mean customers can use it for both voice and data applications with full confidence. With the rapid growth of VoIP and 'on-net' data services, customers now have a critical need for assured connectivity, which is not available on basic broadband products."

Case Study

Wrest Park Ltd. choose Spitfire to deliver

Wrest Park Ltd. (WPL) provides serviced office accommodation for clients at five locations, including its original and largest Wrest Park site in Bedfordshire. Bob Sampson, Head of IT for WPL, wished to deploy fibre leased lines for data connectivity at each site and invited eight comms providers to tender for the contract, including Spitfire. "I have known Spitfire for 15 years and have always found their service to be exemplary." Spitfire is one of a very few specialist business only ISPs, focusing on the needs of their customers with business class ISP services.



Spitfire strives to provide business class QoS levels and SLAs which are unavailable from ISPs catering mainly for the domestic consumer market. This is the key differentiator for Spitfire's ISP services and the reason why so many business customers trust Spitfire to provide their network connectivity.

For WPL, Spitfire installed gigabit fibre bearer circuits which provide up to 250Mb of bandwidth to each of the five WPL serviced office sites. "Connectivity is increasingly a major selling point for tenants", Bob explains. "These include health service agencies and financial service companies and for them a fast internet connection is critical."

In terms of reliability, Bob has been pleased with Spitfire's service. "I calculate that in the years with Spitfire we have had less than four hours downtime across sites, which is negligible. Spitfire's fibre leased lines are very stable and reliable. But Spitfire also provide a VDSL backup

failover should the leased line suffer an outage."

Regarding support, Bob has only praise for Spitfire. "The level of support you get from Spitfire, both from the account manager and the service team is brilliant, they really look after you." Bob says he also appreciates the personalised service. "When you call, people know your name and are really helpful. If I need something to happen quickly, I know Spitfire will get it done. It's a very good supportive partnership based on teamwork - we're on the same side."

As well as using Spitfire for WPL sites, Bob now uses Spitfire for other businesses in the group. "We use Spitfire for our logistics division which has a mission-critical role within the group. We even use Spitfire for the personal internet connectivity of senior staff, including my own", Bob confirms.

Spitfire aims to operate at the highest standards and provide a quality management system which complies with the requirements of ISO 9001:2015 for the sales, installation and support of integrated telecommunications and internet solutions.

Summing up, Bob says, "Providing premium quality internet connectivity, both in terms of bandwidth and quality of service is a major operating cost for us, but it's key to our service offering for clients. We trust provision of that service to Spitfire because I know they will deliver and it's one less thing to worry about."





The pitfalls of VDSL for VoIP

by Harry Bowlby, *Joint Managing Director*

Businesses of all sizes are increasingly migrating to Voice over IP (VoIP), instead of using conventional ISDN phone lines. VoIP telephony has numerous benefits in terms of cost, flexibility and functionality. But to provide dependable VoIP telephony, a high quality, reliable and secure online connection is required.

Over recent years VDSL (Very High Speed Digital Subscriber Line) technology (aka Fibre Broadband) has become widely established in the UK and offered by a number of business and consumer suppliers through wholesale connectivity arrangements. VDSL is increasingly being used by businesses for high speed Internet access. With download speeds of up to 80Mbps it is not difficult to see why. However a broadband circuit optimised for Internet browsing is not the best choice for VoIP.

While many businesses have found VDSL 'good enough' for VoIP, it carries no guarantees of voice quality or any route to resolution should voice quality become unacceptable. To give satisfactory voice quality, it is generally considered that, a circuit must meet these technical requirements for VoIP:

- Maximum latency 150ms end to end (mouth-to-ear)
- Packet loss less than 1%
- Jitter less than 45ms

These requirements may be met on a VDSL service most of the time; however they are not guaranteed to be met for all or any of the time. A 500ms delay on a web page is barely noticeable; such delay during a telephone call is very noticeable.

Fundamentally VDSL technology is unsuitable for VoIP because it offers no Quality of Service (QoS) guarantees.

As a chargeable option QoS is available on VDSL. VDSL supports two types of services – Best Efforts and Real Time. By default all traffic is 'Best Efforts' meaning that in the event of congestion, voice traffic could get dropped just as likely as all other best efforts traffic.

Real Time QoS is an additional service that can be purchased for downstream VDSL. But there is no QoS mechanism deployed upstream on VDSL, as this is not considered necessary because most web access involves download, not upload. However, a phone conversation is synchronous requiring equal download and upload quality.

So what guarantees does Real Time QoS give? No actual latency, jitter or packet loss targets are stated for VDSL Real Time QoS, the service just offers to prioritise marked packets over others. In the event of poor voice quality on VDSL faults may be reported, however, fault investigation is limited to the underlying broadband service.

VDSL is probably okay for now for many customers. It is considered by many to be adequate for voice, based on how the wholesale network is currently dimensioned and performing. But in the future, VDSL may not perform as it currently does, in which case there are no guarantees to fall back on, because no contractual commitments have been broken.

Network usage is growing all the time. A current important development is television delivery over broadband with new service providers such as Amazon Prime, BT Vision, Netflix and NOW TV requiring assured data rates needed for their subscribers. As this grows other IP traffic may have to take lower priority. High definition TV is already here and Ultra HD (4K) has been launched that uses 30Mbps per TV channel.

As competition grows to become a leader in the streaming TV market, the national IP network will have to meet this new objective. Given the amount of money being spent on content for TV services, internet broadcasters will be keen to ensure that viewers on VDSL have priority access.

As video traffic grows it will take priority over VoIP traffic and voice may get squeezed out resulting in call quality issues, which neither the end user nor the service provider have any recourse to resolve.





So a critical consideration for customers should be: "If VDSL proves unsuitable over time, can I swap it for another circuit that will work?"

If in time your VDSL circuit proves unsuitable, you may consider replacing it with an Ethernet circuit or complementing it with a voice approved circuit. One problem that can occur is that this is dependent on the supplier chosen being active in your local exchange and also that there is spare capacity to provide the circuit. These conditions may have applied when you initially installed a VDSL circuit but not when you wish to replace it. You may also find that your premises is not suitable for copper or fibre Ethernet, and it can take up to one year or more to install a new Ethernet circuit.

During this period of time, while you are waiting for your new circuit to be delivered and installed your business will continue to experience voice calls of an unsatisfactory quality which may prove unacceptably detrimental to your business.

At Spitfire, we only offer customers our own Voice Approved Broadband circuits for VoIP 'SIP trunks' assuring the end-to-end call QoS with guarantees on Latency, Jitter and Packet Loss both upstream and downstream – guarantees not available on VDSL broadband services. As one of the few ISPs and fixed line operators to offer a SIP trunk service, Spitfire provides a complete end-to-end SIP service via its own IP and TDM infrastructure. Our reassurance of an end-to-end service with QoS guarantees has been a key factor in the success of Spitfire SIP trunks for VoIP.

Businesses, who chose a VoIP solution without appropriate QoS guarantees are gambling with their future. Should voice quality issues arise, they may find that an acceptable solution is unavailable or takes an unacceptable period of time to deliver, leaving them unable to receive a business quality telephone service with a consequent materially adverse effect on their trading ability. VoIP over VDSL is a significant potential risk to UK business.

Partner Service wins 'Editor's Choice Award'

Spitfire's Partner Service has received an 'Editor's Choice Award' from *Technology Reseller* magazine (www.technologyreseller.co.uk) for the company's Partner Service. The Spitfire Partner Service is aimed at enhancing the products and services offered by IT companies, consultants and other organisations that want to offer customers a superior, more integrated service than that offered by the large impersonal ISPs and comms providers.

The Spitfire Partner Service has been highly successful with over 500 reseller partners benefitting

from generous commission payments, outstanding training, support and assistance from technically competent IP Engineering certified account managers.

Nick Goodenough, Partner Service Director stated, "It's extremely gratifying for our staff and partners to be awarded this 'Editor's Choice Award' by *Technology Reseller* magazine. We have built our Partner Service thanks to our dedicated Partner Account Managers who are available to meet all our partners' requirements, from



on-site meetings, demos, and quoting the end user or our partners as required. Our partners can generate incremental new revenue from voice and data services from their clients. Spitfire provides partners with regular conferences, training seminars, partner newsletters and access to a dedicated portal and extranet."

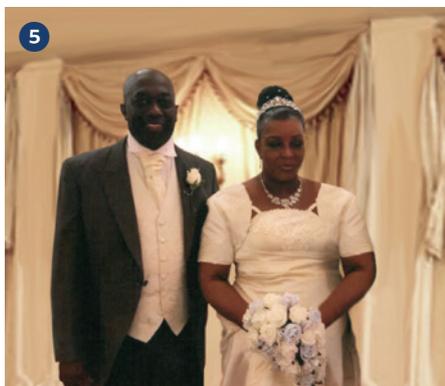
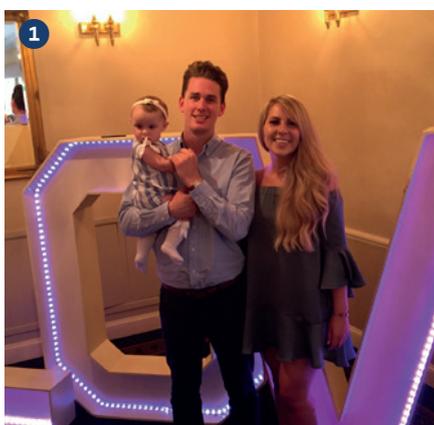


Update to Spitfire Logo

SPITFIRE®

VOICE • INTERNET • WAN

With growing demand for our WAN and IP Engineering solutions we have updated our logo to reflect this, replacing Data with WAN in our strap line. Our cost effective WAN solutions can be scaled to suit any size of business needing a solution to accommodate remote workers, multiple office locations or using cloud services ensuring high-speed, secure and ultra-reliable inter-site and internet connectivity.



Staff News

- 1 James Warcup and his partner Melanie celebrated the birth of their daughter Avery.
- 2 Neil Harper with his partner Kate and Oliver who is starting his Spitfire training early!
- 3 Rob Harradine, Sarah and Willow welcomed Lorelei to the family in August.
- 4 Andrew and Elinor Battersby with their twins Henry and Felix.
- 5 Congratulation to Terri Labastide on her marriage to Lloyd in September.
- 6 Rob Harradine, James Newton and Andrew Battersby were relieved they made it to the end of the Rough Runner Fun Run.

Spitfire Awards

We are delighted to have been awarded the Soft Tech 100 award for *Best Business ISP* and in November 2017 to receive the Facilities Management Award for *Best Telecoms and IP Engineering Services* in the South East from *Build Magazine*.

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