First quantum-based network in UK is virtually 'un-hackable'

BT says it has built the UK's first practical quantum-secured high-speed fibre network. It runs across a standard fibre connection through multiple BT exchanges over a distance of 120km, and is said to be capable of transferring data at 500Gbps.

The network is part of a collaborative project led by the Quantum Communications Hub and was constructed by researchers from BT, the University of York, and the University of Cambridge over the past two years. It connects to the Cambridge Metropolitan QKD Network which was launched on 13 June.

The partners say the aim is to validate use cases for Quantum Key Distribution (QKD) technologies. This will include how the technology can be deployed to secure critical national infrastructure, as well as to protect

the transfer of critical data, such as sensitive medical and financial information.

The quantum link itself is said to be virtually 'un-hackable' because it relies on the use of photons to transmit data encryption 'keys' across the fibre. BT says that should this communication be intercepted, the sender will be able to tell that the link has been tampered with and the stolen photons cannot then be used as part of the key, rendering the data stream incomprehensible to the hacker.

The partners are using equipment from ID Quantique to transmit the data encryption key using a stream of single light particles across the fibre network. In parallel, the encrypted data flows through the same fibre, powered by equipment from ADVA optical networks.

The fibre runs from Cambridge University

Engineering Department's Centre for Photonic Systems via quantum 'repeater stations' at Bury St. Edmunds and Newmarket before making its way to BT's labs at Adastral Park in Ipswich in what's claimed to be less than a thousandth of a second.

Professor Tim Spiller, director of the Quantum Communications Hub, says: "We know that QKD technology works. The importance of this network is the demonstration of its operation to potential end users and customers in a practical network environment, in order to stimulate market pull."

The link is a joint initiative of BT and the Quantum Communications Hub which is led by the University of York and is one of four hubs in the National Quantum Technologies Programme. The hub is a collaboration between eight UK universities, private companies and public

The network ran across a standard fibre connection from Cambridge to BT's labs at Adastral Park in Ipswich (pictured) in what's claimed to be less than a thousandth of a second.

sector stakeholders that have common interests in exploiting quantum physics for the development of secure communications technologies and services. ∎

Breakthrough for long distance quantum comms – News, Oct 2017 issue.

Fear of data hacks leads to drop in use of unlicenced software

Twenty one per cent of software installed on computers in the UK in 2017 was not properly licenced, according to the 2018 *Global Software Survey* from BSA: The Software Alliance. This represents a one-percentage point decrease compared to the organisation's previous study that was released in 2016.

The study reveals that the commercial value of unlicenced software installed in the UK was £1.05bn. This is the third highest value in Western Europe after France (£1.4bn) and Germany (£1.2bn), and 15 percent of the total value in Western Europe.

The alliance believes this rate of use has been partly influenced by significant trends such as an increased uptake in software asset management (SAM) programmes, adoption of subscription models, and growing awareness of the cyber security risks linked to the use of unlicenced software.

Globally, 54 per cent of CIOs cited cyber security risks as the number one reason to avoid unlicenced software, while 46 per cent said loss of corporate/personal data was their top concern about malware effects from unlicenced software. As a result, the BSA

says the number of CIOs who have a formal written policy about the use of licenced software has jumped dramatically from 41 per cent in 2015 to 54 per cent this year.

While the use of unlicenced software around the world is down slightly, it is still widespread. The alliance found that it is still used globally at "alarming" rates, accounting for 37 per cent of software installed on personal computers. That compares to 39 per cent in 2016.

According to the BSA, studies show that organisations can achieve as much as 30 per cent savings in annual software costs by implementing a robust SAM and software licence optimisation programme. The alliance's president and CEO Victoria Espinel says: "Organisations around the world are missing out on the economic and security benefits that well-managed software provides. Businesses should establish SAM programmes to evaluate and manage the software on their networks. This, in turn, helps organisations reduce the risk of debilitating cyberattacks and helps grow their revenues." ∎

"Smartest" street showcases IoT

Newcastle is claimed to have become home to the UK's smartest street as part of the Great Exhibition of the North. Mosley Street and the connecting Neville Street will be equipped with IoT sensors to showcase the possibilities of smart city technologies.

Until 9 September, visitors will be able to experience several smart city applications which will be available either at the street installation, or through data displayed on screens throughout the city and integrated with the exhibition *Wayfinding App*.

The project will combine live and historic data on the street from several sources, including Newcastle University's Urban Observatory which is said to house the country's largest set of real-time urban data.

The smart city applications being showcased include: using data trends to predict whether you'll be able to find a parking spot; using predictive analytics to enable power companies to manage energy consumption more effectively and improve safety with lighting; using AI and video analytics to predict the effect of traffic on the road surface; amongst others.

All of the applications are facilitated by *Cisco Kinetic for Cities* which has been developed to provide a single platform for all smart city use cases. The company says this securely connects data from all kinds of devices, sensors, cameras, applications, etc., in an open, standards-based infrastructure.

Connexin has designed and built the infrastructure to support the smart city solutions in Newcastle. It has integrated sensors and cameras onto the network, providing a dashboard via *Cisco Kinetic* where data can be tracked and monitored.

Other partners include Mayflower which has supplied its *Central Management System* to provide remote control, monitoring and
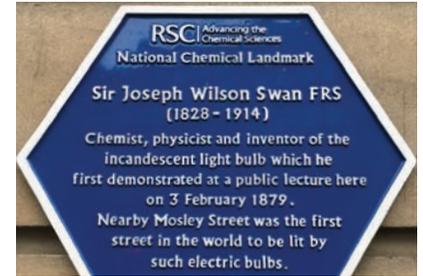
Mosley Street was the world's first street to be lit by an incandescent lightbulb. According to Cisco, it will now achieve another feat as the UK's smartest street.

energy measurement of street lighting over a wireless interface (ZigBee/GPRS). Quantela is the project's integration and AI partner. ∎

Fixed Wireless Access "crucial" for meeting broadband targets

Ofcom needs to consider new approaches to spectrum management to realise the full possibilities of 5G across the country, according to the Independent Networks Co-operative Association (INCA).

In a recently published report jointly compiled with the UK Wireless Internet Service Providers Association, INCA discusses the role independent networks will play in realising the government's broadband targets, especially in rural areas where investment in full fibre will take much longer to realise. It believes Fixed Wireless Access can play a crucial role in delivering high-speed broadband nationwide.

"The way spectrum is currently managed means that large parts of the UK won't get access to services promised by the big operators which tend to be the winners in the national spectrum auctions," says INCA CEO Malcolm Corbett. "This means much of the spectrum is likely to sit unused when it could be used to connect entire communities in rural and hard-to-reach locations."

According to the association, the way spectrum is currently auctioned grants organisations exclusive use of parts of the spectrum with no obligation to use it. It says the proposed upcoming auctions of spectrum in the 3.6GHz to 3.8GHz band envisages national licences that are likely to be purchased by large mobile companies for use in urban 5G rollouts over the next 10 years.

"With access to the new spectrum band, wireless broadband operators could install superfast and even ultrafast broadband to millions of properties quickly and at a low cost. But this cannot happen without a change in how spectrum is allocated," says Corbett.

The report calls for Ofcom to consider allocating spectrum on a geographical basis. It says major operators should bid for valuable chunks in areas where it is economic for them to deploy networks, while other players should be allowed to purchase the usage rights of remaining spectrum in more challenging areas, where wireless broadband operators deploy services. ∎

Quobyte to manage storage for 'super-data-cluster'

The Science and Technology Facilities Council's Scientific Computing Department will use Quobyte's *Data Center File System* to manage the *JASMIN* phase 4 'super-data-cluster'.

Funded by the Natural Environment Research Council and the UK Space Agency, *JASMIN* provides the UK and European climate and Earth-system science communities with a globally unique data intensive analysis and computational e-infrastructure. The facility currently supports more than 160 projects and 1,700 registered users, processing an average of 1-3PB of data every day with expansion to 300PB expected by 2022.

The infrastructure provides compute processing and scale-out storage linked together by a high bandwidth network in a unique supercomputing topology. It provides short-term project storage, batch computing, hosted and cloud computing services, and is said to reduce the time it takes to test new ideas and obtain results from months or weeks to days or hours.

Quobyte says its *Data Center File System* gives *JASMIN* the ability to unify file, block, and object storage datasets in a centralised environment consisting of 11,500 cores on 600 nodes.

In addition to having S3 connectivity, the firm says its system also gives the facility's administrators the ability to scale their storage capacity – currently

JASMIN currently processes an average of 1-3PB of data daily with expansion to 300PB expected by 2022.

at 42PB – and performance linearly with complete hardware independence.

At the same time, Quobyte claims the system provides ease-of-management with very little staff due to the software's ability to self-monitor, -maintain, and -heal.

It adds that the software's dashboard allows an administrator to "easily monitor thousands of physical machines in real-time, easily identifying load or tracking down issues". ∎

JASMIN to be twice as capable after upgrade – News, March issue

"Keep everything, delete nothing"

Despite industry analysts such as IDC forecasting that the digital universe could grow to more than 160ZB of data by 2025, Spectra Logic predicts that much of this may never be stored or will only be retained briefly.

In its *Digital Data Storage Outlook* report for 2018, the vendor aims to provide an overview of the storage tiers that define long-term storage today and those that will impact the industry tomorrow, such as flash, disk, tape, optical and cloud.

In the report, Spectra estimates a high growth rate for solid-state storage through 2020, followed by steady growth at a lower percentage from 2021-2026.

It reckons that by 2020, the disk industry will be serving a singular market, predominately for large IT shops and cloud providers.

According to Spectra, tape technology has the "greatest potential" for capacity improvement of all current technologies,

with a "robust" growth path over the next several years. It also believes that complex workflows and cloud options are prompting IT administrators to consider new strategies regarding what data should be stored where for best practices in data storage and disaster recovery.

"We are living in an era of keep everything, delete nothing," says Spectra Logic CEO Nathan Thompson. "While digital information is clicked, viewed and shared, not everything is protected and preserved for the long term."

Thompson says the dilemma is that people think that they can keep data forever without putting a data protection plan in place. What's therefore needed is strategic planning and the implementation of a long-term digital data protection plan.

"As the volume of data expands, considerable storage innovation is needed to meet capacity, performance and budgetary requirements," says Thompson. ∎

Vodafone to trial 5G in seven cities as part of 'Gigabit UK' programme

Vodafone has unveiled seven UK cities that will become 5G test areas. Customers in Birmingham, Bristol, Cardiff, Glasgow, Liverpool, London and Manchester will be able to try out the technology following rollouts that are scheduled to begin between October and December this year.

In June, the mobile operator said that its engineers were already laying the groundwork for 5G at more than 40 sites in the cities. It said that discussions with a number of enterprise customers were also under way, with a view to testing new 5G applications such as AR and VR in offices, factories and hospitals.

Vodafone says the upcoming trials will ensure that it is ready for the commercial launch of full 5G, which is expected to arrive early in 2020. The company added

that it is able to commit to conducting the "most comprehensive" 5G trial announced to date after winning the largest block of spectrum in the auction that took place earlier this year (*see News, April issue*).

Vodafone said its *Gigabit* UK programme also involves offering customers fixed broadband using gigabit-capable FTTP connections. Customers in Aberdeen, Coventry, Edinburgh, Huddersfield, Milton Keynes, Peterborough and Stirling will start receiving the firm's *Gigafast Broadband* service, towards the end of 2018.

"We want to make 5G and new fibre broadband services available to consumers and business throughout the UK, delivering a Gigabit society for all," said Vodafone UK chief executive Nick Jeffery. "We will also be bringing ultra-fast 4G to several hundred sites in hard to reach rural areas this year, building on our position as the network that offers the best voice coverage in the UK."

Both 5G and the broadband services will be connected using *RedStream*, Vodafone's nationwide, all optical fibre core network. It's claimed this currently links 1,300 broadband exchanges and nearly 1,600 other locations such as retail parks, new builds and business premises.

Vodafone said that it has also recently tested new photonic technology capable of carrying information over the core network at speeds of up to 400Gbps. ■

James Hope, Vodafone UK's head of networks for the North, with a new 5G base station in Manchester which is one of seven cities set to become a test area.

THE WORLD ACCORDING TO...
Sandra Bell, head of resilience consulting, Sungard Availability Services

Organisations still approaching ransomware in the wrong way

It's now been over a year since organisations across the globe, including a third of NHS trusts, fell victim to a crippling ransomware attack. In the fallout, a picture began to form of a whole host of organisations setting themselves up for failure in the face of an attack of this scale by their inability to action a number of basic cyber resilience recommendations.

In fact, being resilient in the face of ransomware is fairly straightforward if you are prepared. From a technical perspective, if you have backups and your network is segmented, all you have to do is wipe the infected computers and retrieve them from backups. In this instance, the recovery could take as little as 20 minutes.

But, as we've seen in the past year or so, even the largest of organisations aren't getting these basics right. This means that what should have been fairly straightforward technical fixes are escalating to uncontrolled operational business issues and then to full blown crises involving the boards of organisations needing to intervene and fight for the company's survival.

In the face of an increasingly threatening cyber landscape, why are organisations continuing to set themselves up for failure?

It often comes down to human psychology. Ransoms rely on manipulating someone into doing something they don't want to do: so in the case of ransomware,

the systems and data they hold are the prisoner being held for money.

Interestingly, our recent research revealed that 28 per cent of UK employees claim their company hasn't provided them with the tools to overcome the challenges they face. If businesses aren't providing the right tools and training to mitigate against security threats, there is little that employees can do to help shield the company.

But tools are only half the story. Companies also need to build a working culture that prevents employees becoming attractive targets. This could be as simple as analysing working practices. For example, if you're in an open-plan office and a ransomware screen pops up, you're likely to point it out to your colleagues before acting yourself. However, if you are in your home office or feel only loosely affiliated with your employer, you're more likely to act on your own gut feeling, which could have serious consequences.

While there's no single solution to the ransomware problem, businesses need to recognise the need to safeguard their people from becoming targets while also having a solid backup strategy and disaster recovery and business continuity arrangements in place. But, should the attack escalate, your response won't succeed unless you also have the crisis leadership skills and knowledge.

IEEE adopts OpenFog's reference architecture as new standard

The OpenFog Consortium's reference architecture has been adopted as an official standard by the IEEE Standards Association.

Known as IEEE 1934, the new standard relies on the reference architecture as a universal technical framework that enables the data-intensive requirements of the IoT, 5G and AI applications.

Fog computing is a system-level horizontal architecture that distributes computing, storage, control and networking resources and services anywhere along the cloud-to-things continuum. It is said to enable services and applications to be distributed closer to the data-producing sources, and extends from the 'things', over the network edges, through the cloud and across multiple protocol layers.

The OpenFog Consortium was founded more than two years ago to accelerate adoption of fog computing through an

open, interoperable architecture.

Its reference architecture was released in February 2017 and is based on eight core technical principles (termed 'pillars') which represent the key attributes that a system needs to encompass to be defined as 'OpenFog'. These include: security, scalability, openness, autonomy, RAS (reliability, availability, and serviceability), agility, hierarchy and programmability.

OpenFog Consortium chairman Helder Antunes says: "We now have an industry-backed and supported blueprint that will supercharge the development of new applications and business models made possible through fog computing. This is a significant milestone for OpenFog and a monumental inflection point for those companies and industries that will benefit from the ensuing innovation and market growth made possible by the standard." ■

KADIUM

F-Secure acquires MWR InfoSecurity

F-Secure has agreed to buy all the outstanding shares of MWR InfoSecurity. "Their threat hunting platform (*Countercept*) is one of the most advanced in the market and is an excellent complement to our existing technologies," says F-Secure CEO Samu Konttinen. With close to 400 employees, MWR InfoSecurity is said to be one of the largest cyber security service providers serving enterprises globally. F-Secure reckons the acquisition, for an initial cash consideration of £80m, makes it the largest European single source of cyber security services and solutions. In addition, an earn-out of a maximum of £25m in cash will be paid after 18 months of the completion subject to the achievement of agreed business targets for the period from 1 July 2018 until 31 December 2019. ■

LiveAction and Savvius merge

Network management and analytics software provider LiveAction has acquired Savvius. It's claimed the deal will enable Savvius to accelerate the development of its packet-capture, analytics appliances and forensic software solutions, while adding new capabilities to LiveAction's visualisation engine. The companies claim that combining their strengths will yield solutions with an "unprecedented" ability to visualise, simplify, optimise, and troubleshoot enterprise networks, from data centre to edge, including east-west traffic and key multi-vendor application and performance monitoring metrics. Financial terms of the deal were not disclosed. ■

Telefónica UK upgrades critical power systems

Telefónica UK is upgrading its existing UPS systems with the help of Sudlows. Under a multimillion pound contract, the Manchester-headquartered critical infrastructure specialist will design and install a range of modern solutions and associated electrical switchgear throughout the Telefónica UK estate. The company says it will also provide "enhanced" cooling capability to support the UPS operation, delivering N+N resilience and "substantial" operational energy savings. Simon Wedd, programme manager for Telefónica UK, says: "We'll work together to achieve a seamless swap out of equipment in a commercially viable way." ■

TfL trebles BYOD users in one year

Transport for London (TfL) has increased the number of users on its bring your own device scheme by 170 per cent in a single year, according to new research from the Parliament Street think tank.

Following a Freedom of Information request, TfL disclosed 816 devices registered under its BYOD scheme in the 2016 financial year which grew to 2,328 for the 2017 financial year.

When mapped against publicly available staff records of 28,000 employees, Parliament Street says the data suggests the organisation has nearly trebled the number of people who are permitted to work using their personal mobile device or laptop.

TfL said 1,326 devices had so far been registered under its BYOD scheme for the current financial year, surpassing the total throughout 2016.

Researchers also asked for a breakdown of devices currently registered. The *iPhone* topped the list with 606 staff members

Experts say that for TfL to build a truly digital transport service, it must enable staff to work on devices they are familiar with.

registering the handset, followed by 469 Samsung devices and 43 *iPads*. On the lower end of the scale there were 19 Google Pixels, 19 Huawei phones, 15 Sony *Xperias*, and only six HTCs.

A TfL spokesperson also provided the following comment: "We take personal security management extremely seriously and each device has a unique password. We regularly analyse our authorised user database and our information security policies are refreshed to address the

changing cyber threat landscape."

Parliament Street published its findings in a report entitled *Smart Transport: BYOD and Beyond*. Among its key recommendations is for TfL to increase its BYOD usage to at least 15 per cent of the workforce in the next financial year, and encouraging it to share analytics and performance data across the network.

Adam Perry, director at connected transport provider Resonate, says: "Building a truly digital transport service means enabling staff to work on devices they are familiar with, which will inevitably improve productivity."

Perry adds that increasing mobility is only the first step in enhancing the transport network. He believes it is also vital to share critical data such as insights into arrivals, departures and timetables. "This will enable every team member to make informed decisions based on accurate information and improve customer experiences for the long term." ■

Hospitals maintain data centre health with SITE

Secure I.T. Environments (SITE) has announced two separate data centre projects with hospitals.

Towards the end of June, the Bedfordshire-based firm said that it has now completed the new 41m² secondary data centre at the Ysbyty Glan Clwyd Hospital which is part of the Betsi Cadwaladr University Health Board, the largest health organisation in Wales.

The hospital is currently undergoing a major redevelopment and modernisation programme which included the need to establish a new energy efficient secondary

data centre within its premises.

SITE worked closely with the principal redevelopment contractor, Laing O'Rourke, to design, supply and install the new facility which meets the Class 2 requirements defined in BSEN 50600 parts one and two.

The room comprises 16 19-inch cabinets, raised access flooring, an overhead busbar power supply system, Novec fire suppression and VESDA detection systems, DCIM environmental monitoring of the room and infrastructure, access control and CCTV.

SITE says cooling and environmental

controls are achieved through a chilled water system with a capacity of 160kW, with secondary piping to support additional chillers to achieve a Class 4 rated system. N+1 in-row air conditioning was installed in a hot aisle containment configuration, while UPS systems and batteries were installed in a separate nearby room, derived from separate A&B power supply stream.

Earlier in the month, SITE announced that it had been awarded a three-year maintenance contract at The Queen Elizabeth Hospital King's Lynn NHS Trust. ■

Intercity to manage Lambeth's LAN

Lambeth Council has partnered with enterprise mobility and IT specialist Intercity Technology to enhance its digital services for local residents through a fully-managed and flexible IT support service.

Since 2011, Intercity has worked in partnership with Virgin Media Business to manage and monitor Lambeth's LAN and security systems. The council has now extended its contract to benefit from what's described as a "secure and flexible" fully-managed network service delivered by the Intercity Security Operations Centre.

The company claims this round-the-clock monitoring of Lambeth's network estate will ensure the continuous smooth-running of its core systems. Intercity says it will also help to improve efficiency across the

council's workforce by removing the need for on-site network resources, allowing the organisation to focus on serving the 330,000 residents across the borough.

"It's important for us to work with a provider that is receptive to our needs," says Paul Wickens, head of IT, Lambeth Council. "Throughout our seven-year partnership [with Intercity], we've always been able to adjust the services we need as and when."

As part of its ongoing relationship with Lambeth, and following its provision of enhanced management and support during the local elections held earlier this year, Intercity will also be on hand to offer additional resource during peak times to ensure the council can keep up with the network demands.

Intercity says 24/7 monitoring of the council's network estate will ensure the smooth-running of its core systems.

This latest deal for Intercity follows a recent contract renewal to support GÉANT's pan-European research and education network (*see News, May issue*). ■
Monitoring the LAN – feature, pp10-13.
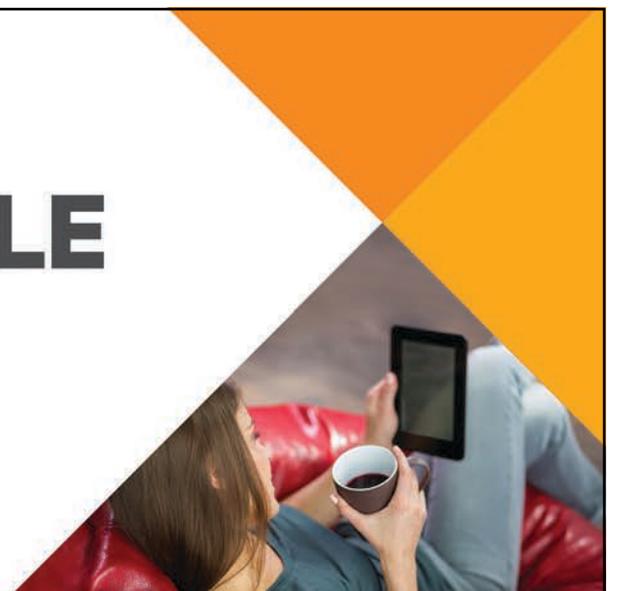
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Mellanox claims a first with hyper-scalable enterprise framework

Mellanox Technologies claims to have launched the industry's first truly scalable, open framework for private cloud and enterprise data centres.

The company says its *Hyper-scalable Enterprise Framework* enables organisations to build a high performance 25G, 50G and 100G hyperscale Ethernet network using industry standard hardware and commercial and open-source software, and without the need for a hyperscale budget or resources.

There are five key elements to the framework. They include: Mellanox's end-to-end suite of adapters, cables and switches; an open and fully disaggregated networking platform; a fully converged network supporting compute, communications and storage on a single integrated fabric; 'software defined everything' ('SDX') which embraces networking, storage and virtualisation; and cloud software integration with the most popular cloud platforms such as *OpenStack*, *vSphere*, and *Azure Stack*.

The company reckons its end-to-end networking suite delivers advanced acceleration features combined with ease of deployment and management.

According to Kevin Deierling, Mellanox's VP of marketing, the new framework provides an intelligent, high performance

and fully converged network to enable enterprise and private cloud architects to build a world class data centre.

He adds: "With the advent of open platforms and open networking, it is now possible for even modestly sized organisations to build data centres like the hyperscalers do." ∎
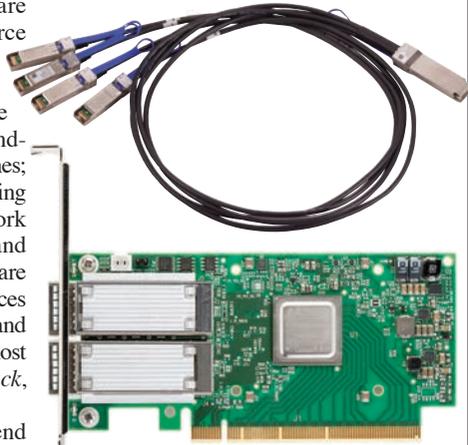
Mellanox says one of the key elements of the new framework are its end-to-end suite of adapters, cables and switches that have already been "proven" within hyperscale data centres.

Moving Wireless Forward

Mobile Mark is a leading supplier of innovative, high performance antennas to wireless companies across the globe. We benefit from enhanced design capabilities and expanded production capacity all of which have allowed us to become one of the best antenna developers in our field.

Our customers have been our partners for many years. We believe in taking the time to understand our customers' and deliver innovative, tailored solutions to meet their specific antenna requirements.

Rapid prototyping capabilities allow us to take our designs from concept to reality in an extremely short time span, and to verify the performance of the antenna. Here are a few examples:

Commercial Fleet Management
Mobile Mark has consistently lead the industry with the most extensive and innovative range of antenna solutions that combine multiple wireless technologies: from simple GPS & Cellular antennas to complex 6-cable antennas combining LTE MIMO, WiFi MIMO, DSRC and GNSS in the same antenna housing. This combination of wireless technologies allows fleet owners to track and/or redirect their fleets of cars and trucks for optimum efficiencies. Mobile Mark antennas are rugged enough to handle tough environments and efficient enough to maintain reliable connections.

Public Transit & Bus Management
From monitoring the location of the bus to monitoring the condition of its tires, wireless has become an essential part of professional bus management. Mobile Mark's multiband antennas allow the system to capture that information and transmit it back to a central monitoring station with real-time connectivity. For an added touch, real-time WiFi service can also be added for the passengers.

Let us know how we can help

We understand the RF wireless world and are ready to help you evaluate your options. Contact us by email, phone or fax and let us know how we can help.

THE IoT CONNECTION
News & developments from the world of the Internet of Things. This month, we look at the automotive sector.

Making truck tyres smarter

Tyre-maker Continental reckons it is helping to make the world's roads safer with Vodafone's support through a new digital tyre monitoring platform that uses the IoT.

The *ContiConnect* platform is currently deployed in Canada, Malaysia, Thailand and the US, with more markets in Europe and Asia to follow in 2018 and next year. A date for UK availability has yet to be announced.

ContiConnect is connected to Vodafone's mobile network. Special Continental sensors continuously monitor tyre pressure and temperature data and transmit this information to a receiver unit. This then sends the data in real-time to a central web portal where a software program analyses it. It sends alerts via email or SMS to fleet managers if tyre pressures or temperatures deviate from the defined value, and suggests corrective measures where necessary.

According to Continental, the regular data streams that are sent to the managers help them plan tyre changes and maintenance far more efficiently, improving the operational performance and lifespan of the tyres.

It adds that pressure monitoring also contributes to protecting the environment because tyres that are operated at optimum pressure save fuel and reduce a commercial vehicle's CO_2 output. For example, the company says a tyre operating at just 80 per cent pressure uses around 0.9 litres more fuel for every 100km. Over an average distance covered of 120,000km per year, that adds up to 1,080 litres more fuel consumed for each tyre.

Jaguar Land Rover gets mobile with on-board cell connectivity

Transatel will provide a global cellular connectivity solution for Jaguar Land Rover (JLR). As part of a recently signed agreement, Transatel will cover JLR's

Using Vodafone's mobile network and ContiConnect, fleet managers can check the tyre pressure and temperature levels of their trucks anywhere in the world. Inset: the sensor is mounted onto the tyre's inner liner, and can either be retro- or factory-fitted.

connected car passenger applications for internet browsing and navigation services from the vehicle console, as well as on-board Wi-Fi. It will provide the service, manage customer and retailer support, and ensure the payment process for the purchase of data bundles by end users.

Transatel will offer data plans for JLR models available in the UK, Italy and Germany. The first cars equipped with the technology include Jaguar's *XE SVR*, *XF*, *XE*, *F-PACE* and *F-TYPE*, and Land Rover's *Velar*. Transatel says users will be able to "seamlessly" manage their accounts via a multilingual self-care application which is accessible with any device using the car's on-board Wi-Fi system.

Paris-based Transatel is a telecoms operator that specialises as a mobile virtual network enabler/aggregator (MVNE/A). Since it was established in 2000, the company says it has launched more than 150 MVNOs (mobile virtual network operators) and built "strong expertise" in M2M connectivity.

It entered the IoT market in 2014 with a cellular solution for global, multi-local data connectivity with eSIM capabilities.

This latest deal is Transatel's second connected car project for Europe. Earlier this year, it won the tender to provide mobile network services for Fiat Chrysler Automobile's on-board telematics units, *Mopar Connect*, in the EU.

Symantec debuts cloud-based network security platform

Symantec reckons it's come up with the industry's first cloud-based network security solution, adding complete endpoint protection.

As part of enhancements made to its *Integrated Cyber Defence Platform*, the company has now added Web Isolation technology to its *Web Security Service* (*WSS*). It claims this enables web browsing without risk of infection by zero-day malware or advanced threats.

WSS is a single-service offering which, as well as Web Isolation, also includes a secure web gateway, malware inspection engines, sandboxing, data loss prevention, and cloud access security broker, and integrates with multi-factor authentication.

Symantec president and COO Mike Fey says: "Web Isolation is a critical innovation that is helping our customers address new types of advanced threats that target employee web browsers by protecting against malware and phishing attacks without over-blocking or impeding productivity."

Other enhancements to the platform include what Symantec describes as "comprehensive" network-to-endpoint protection. Here, it has integrated *Symantec Endpoint Protection* (*SEP*) and *SEP Mobile* into *WSS*, allowing web traffic re-directs to *WSS* for enforcement of network security policies. The firm says this therefore eliminates the need for a separate agent to manage traffic flow.

There's also an *SD-Cloud Connector* which enables customers to combine the performance and reliability of SD-WAN technology with *WSS*. Symantec says this creates a "simple, high-performance method" to connect branch office locations with its cloud security service.

The firm says the new features "provide businesses with a comprehensive, easy-to-use, cloud-based network security service that safeguards critical business information for secure and compliant cloud application and web use". ∎
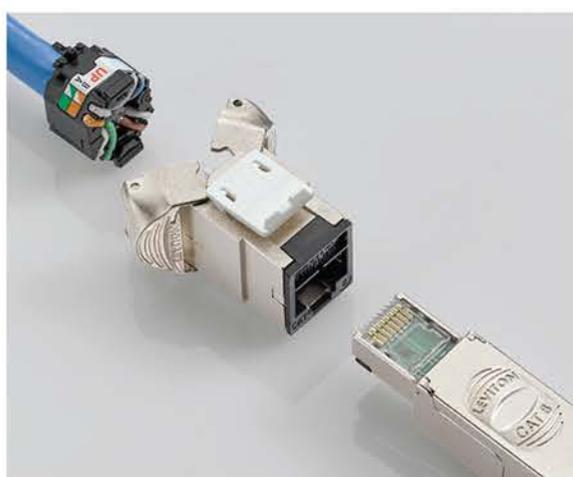
Shop. But don't let the network drop

The face of retailing continues to change dramatically, thanks to innovations in networking.

Networking a Doddle for click and collect businesses

Doddle's aim is to make click and collect the preferred delivery choice for consumers, retailers and carriers. The company has already partnered with more than 100 retailers, including Amazon, ASOS, eBay, amongst others, to offer what it claims is the "best" parcel collection and returns service.

With ambitious expansion plans, Doddle needed the ability to deploy and remotely operate its network across a large number of dispersed sites. It has more than 80 stores in train stations, universities, shopping centres and business parks, and many sites are in confined or restricted spaces. The company therefore needs to operate an efficient and reliable network without cumbersome and space-intensive hardware.

Doddle turned to Cradlepoint for help

to design and deploy a cost-effective, robust solution that would not require a fixed cable or hardware cabinet. The vendor's *AER1600* all-in-one network solution was chosen to replace legacy equipment across 50 stores and is now the technology model for ongoing expansion.

Cradlepoint says it was able to offer a flexible solution with cloud-managed networking and built-in connectivity for DSL, Ethernet, and Wi-Fi with dual-modem, multi-carrier cellular support. Doddle can run multiple handheld computers, label printers, tablets and payment devices alongside the *AER1600*. The platform is then supported by *Enterprise Cloud Manager*, the network management service available in Cradlepoint's *NetCloud* platform.

Doddle CTO Gary O'Connor adds that Cradlepoint has enabled his company to shrink the space taken up by hardware, freeing-up more square inches for parcel storage. As a result of the deployment, it's claimed Doddle can now have a shop up and running within hours and operate from even the smallest places with a minimal footprint.

Cradlepoint says the firm can operate sites from a single in-store connection, bringing together routing, multi-WAN support, advanced security, private network support, and high-performance Wi-Fi in a platform that it can deploy,

manage, and optimise via the cloud.

The platform has also helped overcome another challenge Doddle faced – the company only has a small IT team supporting its employees and resources shared with retail partners. O'Connor says cloud management capability is a big support to the team, allowing them to remotely provision hundreds of devices around the country and isolate and address any issues without having to go into the field. "If we have to validate and switch a connection from wired to mobile, it's easily done."

Constructing a new network for builders' merchant

Grafton Group is said to be one of the country's largest independent building materials group, owning brands including Selco, Buildbase and Plumbase.

The group has started a strategic IT investment programme, replacing legacy systems, updating productivity and collaboration services, and modernising its infrastructure. As a result, it knew that it needed to upgrade its whole network to support the rollout of new technology.

Group IT services director Nathan Bishop says: "As our company had grown, our IT needs had become increasingly complex and our reliance on high levels of network bandwidth and resilience had increased. We knew we needed to update our network and needed the right provider to help us do this."

Grafton had run the majority of its UK data centre operations from Six Degrees' Birmingham facilities since 2010. Following a competitive tender process, the company chose Six Degrees to provision its new group-wide managed network.

The solution includes three key elements: a core MPLS network, managed internet access, and delivery of a branch network across Grafton's entire UK mainland business.

The core provides connectivity from the group's networks in the UK, Ireland and Belgium. This supports shared data centres and managed internet access, as well as branch sites that are the merchant offices serving customers in the UK mainland. Six Degrees has created a private MPLS network linking all of these core and branch locations together.

The service was rolled out to the 500 branch and head office locations in the UK, with managed internet access provided to all Grafton Group companies in the UK and Ireland.

Following the successful implementation, Six Degrees says its experts now manage the services, ensuring Grafton's network is reliable and secure. "Using the Six Degrees infrastructure allows our businesses to stay connected with no fear of overloading the systems or unwelcome downtime," concludes Bishop.

Smart connected lighting cuts costs at Claire's

Claire's (formerly Claire's Accessories) is a speciality retailer of fashionable jewellery and accessories for young women, teens and kids. It was founded in 1961 and is headquartered in Chicago.

In the UK, it reportedly has more than 500 stores and concessions, and one of its major warehouses in the country is in Birmingham. Here, the company has managed to dramatically reduce its energy bills thanks to a smart connected lighting system supplied by enModus. The Chepstow-based firm says its *Wattwave* technology can make any building smart by transforming the existing cabling infrastructure into a building-wide communications network.

When combined with a cloud-based platform, enModus says *Wattwave* delivers connectivity for smart control and intelligence to measure energy usage in real-time across every connected light, asset, circuit or building.

The project for Claire involved using enModus' system with the warehouse's mains wiring. This has enabled lights to be connected to the internet, and then monitored and intelligently controlled.

Using real-time measurement, enModus says Claire's validated a total energy saving of 96 per cent against the replaced light fittings. The company adds that once the solution is deployed throughout the warehouse, it can potentially cut energy costs by £107,000 over five years.

Coupled with reduced energy costs, it's claimed the project also helped improve the lighting quality and comfort for warehouse staff, and the management of emergency lights by remotely testing them via the cloud. Crucially, there was zero disruption to operations because the enModus solution uses the existing powerlines.

John Wanklyn, VP of sales and marketing at enModus, says: "Claire's was keen to test out our unique technology to see how it could radically reduce costs and improve its environmental impact with minimal disruption to the busy workforce.

"As well as saving money and reducing CO2, companies can deploy our solution without the need for expensive refits as it uses existing power cabling infrastructure."

Wanklyn points out that smart lighting is just one application for *Wattwave*. "Once installed, we enable a building-wide communications network that can deliver other benefits including real-time intelligence on building occupancy and other sensed inputs, plus ultimately control any mains connected asset."

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When asked exactly what should be monitored on the network, many specialist vendors say the answer is simple: everything. For example, ExtraHop claims its platform uses real-time analytics to auto discover and classify every asset in the enterprise, map all connections and dependencies, and monitor traffic flow at up to 100Gbps.

Joining the dots

When it comes to network visibility, a good monitoring platform should start with the needle and not the haystack, according to one specialist firm we spoke to. RAHIEL NASIR finds out more.

Many network managers have a lot more than usual on their plates at present.

As well trying to lasso networks that seem to be carrying a non-stop supply of traffic fed by an ever-growing number of devices (both authorised and unauthorised), there's the never-ending quest to keep on top of security issues, facilitating ongoing digital transformations as well as other projects, and all while dealing with day-to-day issues and trying to please the taskmasters.

When asked to identify the current pain points when it comes to monitoring LANs, many of the companies that specialise in network performance analytics that we spoke to agreed that the move to cloud-based services is certainly making things trickier.

For instance, Ian Hameroff, director of product marketing at ExtraHop, says the complexity and surface area of today's enterprise networks are growing at a rapid rate, and it's not only what's behind the firewall that's critical: "It's also the fact that every organisation is now a hybrid enterprise with a healthy mix of on-premises, edge, and cloud investments.

"NetOps professionals often find themselves metaphorically stuck watching all of their haystacks grow, while they struggle to know where to begin when the business expects them to quickly find the needle if there's a security, user experience, performance, or compliance issue."

Steve Brown, director of solutions marketing at VIAVI Solutions, says the decision to move networks and applications to hybrid clouds or maintain on-premise services is typically made

outside of the network team. He points out that this creates visibility, control and resolution challenges. "The movement to the cloud means rethinking how you view, assess and troubleshoot performance and user experience. These same visibility challenges can be seen as the network pushes to a more software-defined model, and the question is whether visibility and performance management is built-in during deployment or bolted on after it."

Jay Botelho, director of products at Savvius (which has now been acquired by LiveAction – see News, p4) agrees that the accelerating move towards private/public cloud application deployment is leading to significantly decreased network and application visibility.

He says: "Most network performance management and diagnostics (NPMD) solutions on the market today were designed and optimised for 'traditional' on-premise, data-centre-style deployments. These provide a good view of data going to and from the cloud (private or public) but are completely blind to traffic within the cloud, hiding critical data needed to troubleshoot problems like poor application performance."

For Edmund Cartwright, sales and marketing director at Highlight, Wi-Fi is probably the biggest pain point when it comes to LAN monitoring. Unlike switched and wired networks, which tend to be predictable and stable, he says Wi-Fi is "highly susceptible" to interference and signal strength problems, despite increasingly being the path of choice for people working on-site. "A wide range of vendors with no clear market leader, and

rapidly changing management interfaces as people scramble to develop their offerings, makes monitoring Wi-Fi a real challenge."

Enterprise cloud networking specialist Aerohive also considers the oft reported issue about the Wi-Fi not working as a typical problem. "Any networking professional out there will instantly understand the frustration behind this complaint because it provides little context," says the company's product marketing director Mathew Edwards. "In actuality, it could be a number of issues – incorrect credentials, DHCP server out of leases, unresponsive DNS server, account lockout in AD, WAN-related issues, etc. It could also be something Wi-Fi related – poor signal strength, low S/N ratio, incompatible encryption, and much more."

Edwards continues by saying that once enough information has been gathered, the network manager begins the troubleshooting process. "You might check the DHCP server, AD account, Wi-Fi conditions in that area… the list goes on. All that time and effort is spent attempting to resolve a simple issue for a single client."

And as Edwards goes on to highlight, when you're dealing with an organisation with hundreds or thousands of user complaints, each with varying degrees of complexity, the IT team suddenly ends up with a major crisis to resolve.

That's assuming that they can get all the data they need to resolve the issue in the first place. Botelho believes another pain point in monitoring LANs lies in the depth of information available in today's monitoring systems. He says NPMD solutions are increasingly relying on

flow-based data to provide networking monitoring information. Although this is very useful and in most cases plentiful, he says it often lacks sufficient detail to truly determine the root cause of a problem.

Clearly then, and in the words of Paessler's UK&I head Martin Hodgson, network performance has never been more crucial, whether it's at the core, edge or WAN. He adds: "It's important to consider and prepare for the influx of new devices and the extension of responsibility to items outside the network manager's usual scope, such as CCTV, IoT and BMS, for example."

Paracetamol for the pain

According to Mark Boggia, partner for learning and development at Nexthink, having an end-to-end monitoring solution that centres itself around the end user experience is critical. He says this essentially represents a customer-first approach and, importantly, is not presumptive.

"When you're a hammer, everything looks like a nail. So, when you're just using a network monitoring solution, you tend to assume that you're having network problems, when in practice it could be something as mundane as running out of disk space, an application crashing, or an altogether different and relatively minor issue."

Boggia believes network monitoring needs to be positioned as a component to a service that a user is consuming. "At a metric level, we typically see latency and slow response times as good indicators, which typically could also be due to related issues such as how shared storage

has been configured in the environment and not the network itself. For this reason, it's important to start with a holistic approach that puts the end user first."

Brown also highlights the importance of prioritising people as well as processes. He says that the questions that need to be asked here include if there is any active communication and decision-making between all the IT stakeholders when new initiatives are rolled out; and if the server teams are working with the application and network teams when migrating to virtual or cloud environments to ensure the service functions as expected. "Being transparent and having active discussions during the roll out of initiatives before implementing configuration and network changes can reduce unexpected performance problems."

Next, Brown says there should be performance solutions in place that can be used by any team from the network to support positive end user experiences in hybrid environments. "This is where visibility, ease of use, and accurate analysis are key to providing teams with the right information to prioritise and solve performance issues."

Of course, the subject of data security is never far away from all things networking, and especially when it comes to monitoring. While new data rules and legislation may be a hassle for IT teams to implement, they also present a good opportunity for them to re-assess all aspects of the enterprise network infrastructure.

For instance, Paessler's Hodgson says: "As many vendors have used GDPR to focus on single elements of threat and exposure, now is the time that you really need to know your entire stack – from the physical aspect of the network upwards. And, of course, where additional levels of protection have been drafted in, these add an additional layer of complexity, something that the IT team need to monitor and develop."

Dan Payerle Barrera, global product manager for data cable testers at IDEAL Networks, points out that network protection technologies like IEEE 802.1x, which requires any device to log in to the network at Layer 2, have unfortunately proven difficult to implement and manage. As a result, he reckons many organisations are abandoning these solutions. "This means that network managers need to be continuously monitoring their networks for unauthorised network devices. Many tools exist to accomplish such tasks ranging from PC/mobile device applications, to handheld testers and dedicated network security 'boxes'."

Barrera says handheld testers provide a simple way to connect to a network, either using a wired or wireless link, and scan all the devices, generating a list that can be compared to previous scans or a list of known MAC addresses.

But he goes on to warn that as most networks are configured to have some level of segregation between the wireless and wired portions, a network scanner that connects via wireless only may not detect intruders on the wired LAN.

Barrera also warns that MAC level security is not 100 per cent secure. "Software tools allow network intruders to spoof another MAC address. Spoofing alters the data frames of an attacker's computer and changes its own MAC address to be the same as and approved device that is already on the network.

"For increased protection, network managers can go so far as to track the association between MAC addresses (permanent hardware ID) and IP addresses (temporary software address). They can then be alerted when a device on the network is using an unauthorised combination of MAC and IP addresses."

Monitor everything

So what exactly needs to be monitored on the network?

Aerohive's Edwards says it's firstly essential to understand users and their associated devices. This will be a by-product of UID-based authentication (PPSK or 802.1x, for example).

Secondly, he says managers need the information that relates to a client's connection and journey on the network – IP address, connected SSID (or switch/port for wired), location, and connection health (for wireless, this could be S/N ratio, RSSI, data rates, frequency, etc.).

Thirdly, something along the lines of a packet capture tool will be needed to record network traffic, interpret that information, and then relay it for the purposes of monitoring and diagnoses.

Brown's advice is to have visibility into performance wherever services are hosted and users reside. Hodgson echoes this view and says that when asked what needs to be monitored, the answer is simple: everything.

"That's the first enquiry we get when we discuss our product with an administrator. You want to be able to monitor the physical aspects, such as whether a device is responding, the status of the hardware within it, and how it's performing.

"Then you want to step this up a level and see a management view of what's going on. Flow-based views are a good example. Following this, you would need to get the full instrumentation of your OS, virtual and application stacks. For most of our users, the ability to dynamically change in an instant what their focus is, is compelling."

Savvius' Botelho also agrees that you need to monitor "everything and everywhere", adding that it is important to collect as much data as you can and to find a solution that can do just that.

"In the past, solutions only focused on a specific type of data, such as just packet, just flow, or just SNMP. But today's modern solutions can collect data from all three sources simultaneously, aggregating the data into a single view that indicates overall device health (SNMP), general network behaviour (flow), and specific details for root cause analysis (packets).

"And the more sources of this data, the better. More measurement points lead to a more complete network view, and significantly better metrics, especially for KPIs like network and application latency."

ExtraHop's Hameroff points out that while everything needs to be monitored, not all packets are created equal. He believes every organisation needs to

identify and understand what the most critical assets that impact user experiences and the delivery of business are. They then need to get a firm grip on the dependencies that make those experiences possible.

"No organisation can afford to have tunnel vision, and having a way to effectively know how to balance what's most critical from a performance and security perspective can look like trying to score a goal from outside the stadium," says Hameroff. "You may know where the target is, but the chances of getting the ball to bulge the net seems nearly impossible."

So how do you get the "net to bulge", especially – as VIAVI's Brown says – as engineers don't often know what they need until they are knee-deep into assessing a problem?

"Network monitoring should be capturing all wire data and then automate the process

to help the engineer to decide what data they need to solve the issue," he says. "The network monitoring platform should be smart enough to actively flag the issues, provide guidance to the correct root causes, and granularity to solve the issue.

Brown reckons that many tools currently on the market provide "very limited" perspectives to address only infrastructure, system, or application optimisation. From this, he says the engineer cannot assess user experience or contextually understand service performance.

So what should network managers look for when it comes to choosing a network monitoring platform? Hameroff "strongly" encourages them to find a visibility solution that offers three things: scalability; real-time, definitive insights (not just more alerts or log entries that require data scientists to uncover anything actionable); and a

solution that can provide a fluid, simplified investigatory workflow. "It should be one that starts by giving you the needle instead of asking you to start with the haystack, i.e., not beginning the investigation from a pile of potentially unrelated packets."

He goes on to warn readers to be wary of solutions that only look at Level 2 to Level 4. "User experiences are not solely built on whether packets can flow between hosts. It's critical to have the context of the entire conversation, from L2 through L7. Otherwise, you'll only be able to confirm that a conversation took place – you will not know if the conversation was in the right language or actually accomplished the expected outcome if you just consider the network flows."

Highlight's Cartwright says some network and managed service providers are beginning to invest in SaaS tools that

are "truly multi-tenanted" and designed to be used by the provider and the enterprise network manager. He says this allows both the users of a service like Wi-Fi and the provider delivering it to see a common picture and collaborate on fixing both short- and long-term issues. So for Cartwright, finding a provider that is focused on enterprise customer service through ensuring visibility and transparency is crucial to overcoming the challenges noted earlier.

Meanwhile, IDEAL Networks' Barrera says that when managers are choosing testers, they should opt for models that are in-line or dual port. "Users are often disappointed when they plug their network monitoring tester into a switch port and see a low level of network traffic. By design, only special broadcast traffic or traffic intended for a specific network device is sent to a physical network port. Therefore, it is impossible to see all network traffic by simply plugging into a switch."

According to Barrera, in-line or dual port testers are designed to sit silently between any two points in the network, like a switch and a router, and monitor the packets going back and forth. "It is with this type of connection that all devices and the total bandwidth can be monitored. Think of it as a police checkpoint. Very few vehicles can be inspected if a checkpoint is positioned on a rural road. They will encounter only the vehicles travelling to and from those homes. For maximum effectiveness, a checkpoint needs to be positioned between two main thoroughfares."

Paessler's Hodgson says managers should consider the following when choosing a monitoring platform: "Agentless is essential; the concept of having to install and maintain anything other than the fewest possible number of software components is a given."

He adds that you should also look for support for standard protocols, flexibility of deployment options, and inclusion of all features without the need to purchase enhanced elements.

Edwards adds a caveat to Hodgson's latter point when he says: "Avoid solutions that provide all the bells and whistles but require you to be a vendor-specific expert to actually translate and dig through all the information."

He also says that as user complaints about the network are often raised hours or even days after the event, managers should use a platform that provides historical insight, enabling them to view the information for a relevant point in time.

Edwards continues by saying that at a fundamental level, you should look for a platform with some kind of packet capture capability. "Taking things to the next level, you want something with an automated and proactive means to relay this information. I cannot stress enough the difference this makes. Rather than waiting for user complaints, you'll be informed of detected issues before anyone has a chance to bring it to you. You'll identify issues that may otherwise go undetected."

More artificial than intelligent?

On the subject of automation, there has been much talk of artificial intelligence of late – will this have an impact on network monitoring?

"AI and machine learning are the latest buzzwords and they are being used in the context of monitoring and troubleshooting," says Edwards. "Be careful you don't get burnt by AI-driven tools that help with basic tasks but lack any real value when it comes to getting to the bottom of complex items.

Hameroff is also sceptical: "Unfortunately, we've entered an era where just about everyone speaks of 'AI' as the answer. However, we'd encourage your readers to be suspicious of overly bold claims that cannot be backed up by tangible substance. There's a lot of 'AI-washing' rhetoric out there."

But he is far more upbeat about the concept of advanced machine-learning and says this will have a sizeable impact on networking monitoring and will become a necessity.

"All NetOp pros have lived with the metaphorical 'alert cannon' created by trying to craft the perfect trigger or alert based on some known condition that may take place on the network.

"But, our networks and user experiences are too dynamic and the surface is way too large for any human-driven process. Machine learning (true machine learning, not just basic pattern matching) is critical to proactively squelching the noise, getting the signal, and also making it immediately actionable whether it impacts the performance or security of an user experience. There's truly no other way to keep up with the petabytes of analytical data that can be extracted from even the most common enterprise networks."

VIAVI's Brown also agrees that at this stage, it is more appropriate to discuss adaptive machine learning: "For example, in performance management solutions we have the ability to take disparate measurements and data sets that contribute to user experience and based on algorithms that understand what's normal and acceptable within our customers' environment. This presents a single user experience score along with a plain worded explanation of where failures are occurring."

He's also keen to point out that adaptive machine learning doesn't replace the human: "Its aim is to empower any level of engineer to solve more issues in less time by eliminating the issue of deciding where to begin troubleshooting. Right now, engineers are drowning in data and too many key performance indicators, and they don't know where to begin troubleshooting. Think of it as 'analysis paralysis'. Through adaptive machine learning, easy-to-read analysis and performance visualisations, and 'three-clicks-to-fix' workflows, our solutions guide the engineer to the right answer and resolution."

Others are not so dismissive of AI. For instance, Nexthink's Boggia says it will drive more predictive type use cases in all areas, including network monitoring where it can be used to forecast potential outages or other problems.

Aerohive's Edwards supports this view. He says AI affects more than just monitoring and is a "really exciting" evolution. "Bringing AI to network monitoring has the potential to revolutionise the way we manage our networks. Imagine a platform that doesn't just provide technical information relating to a problem but plainly states exactly why a problem is occurring and how to fix it (better yet, resolves the issue automatically).

"The ultimate goal is for networks to be AI-driven, aided by machine learning. From a monitoring perspective, AI-driven networks provide information that is genuinely insightful. No longer are you told 'you have five authentication issues'; but that: '*Sally has entered her password incorrectly five times, this is because her password expired yesterday, would you like me to send a one-time password to Sally's mobile number?*'.

Savvius' Botelho also believes AI has significant potential in the network monitoring space, especially with NPMD solutions that can use the technology to process huge volumes of information from multiple sources representing large numbers of flows, devices and endpoints.

However, he also says that vendors have been promising predictive network analysis (which is essentially what AI is expected to provide) for well over a decade, and it has yet to be delivered. "Although AI could get us there, every network is unique, and one network's problem is another network's baseline. It takes a tremendous amount of data over a long period of time to truly get to a point where AI can begin to predict what is truly anomalous on a network."

Future monitoring

So apart from the potential of AI and machine learning, what else does the future hold when it comes to innovations in network monitoring?

Hameroff says that as enterprise networks continue to grow in complexity, scale and surface area, as well as transform into policy-driven and orchestrated fabrics that effectively abstract Layer 2 to Layer 4, it will become increasingly more important to avoid approaching them from a "very narrow, potentially myopic" scope. "IT professionals will soon find themselves in a very different place if they fail to recognise that the success of digital business initiatives are predicated on both delivering a compelling, differentiated and highly satisfactory customer experience, and establishing and maintaining trust – all without compromising the organisation's agility, operational efficacy, or scalability."

Nexthink's Boggia is likely to concur here when he says that integration or consolidation into monitoring platforms that allow for multiple perspectives to be considered is increasingly important.

"It is not enough to have just one answer from one tool and another from a different one, and to have to do all of the joining together and thinking for yourself.

"We are seeing a shift away from traditional SLAs as the measure of service, and an increasing trend towards xLAs where the user experience itself is monitored."

Botelho echoes this last point as he concludes: "End-user experience will become the most important metric used to evaluate the performance of a network. As enterprises move into the cloud with SaaS vendors, QoE is the unifying metric that must be satisfied to ensure a truly high-performance network." ∎

Batteries included

We take a look at some of the latest UPS devices available from key marques. Plus, top tips from JASON KOFFLER about how to address organisational power continuity planning.

Critical Power Supplies is an independent installer of UPS systems and generators. MD Jason Koffler says the Oxfordshire-based multi-brand supplier, has more than 25 years' experience of successfully delivering power solutions, project management and support.

He says Critical Power provides a range of services to various clients ranging from corporate users to individual customers. These services start with consultation, site surveys and power analysis before progressing to design specification, drawings, and in-house project delivery.

Koffler has compiled the following 10-point checklist which can be used when addressing organisational power continuity planning:

- Do you know all the critical power dependant applications involved in your business?
- Are all your critical applications covered in the event of mains loss?
- If your UPS or generator was installed some time ago, will it provide the power and runtime required by your organisation today?

- Are your critical applications fed by a second power feed?
- When was your UPS or generator last serviced or 'tested'?
- Do you have maintenance contracts in place for all your critical power infrastructure?
- Are you monitoring all critical infrastructure solutions centrally and remotely?
- Is your maintenance contract 'backed up' by the manufacturer?
- If you are using legacy UPS solutions, have you considered upgrading them for a high efficient design – you could benefit from a 50 per cent energy saving on legacy UPS designs, and certain designs are CRC accredited.
- Is your potential UPS, generator or standby power supplier able to carry out a detailed site survey and produce a detailed report of your load profile over a prolonged sampling period?

According to Koffler, manufacturers warranties are no substitute for maintenance contractors. He says Critical Power Supplies offers a free power continuity survey and maintenance contract upgrade, and that the company can help users right size their energy bills and in-life management costs.

www.criticalpowersupplies.co.uk

Switzerland-based manufacturer **CENTIEL** has introduced the *PremiumTower*, a stand-alone UPS that can be used for applications where a modular system is not always required.

The new UPS offers built-in internal batteries from 10 to 200kW which, according to its maker, minimises footprint, eliminates extra costs for external battery frames, and means easier installation.

CENTIEL says the flexibility in the number of battery blocks (30 to 50) allows the system designer to optimise costs versus autonomy time. It adds that with the ability to provide up to five times more charge current than the typical standalone

UPS, the *PremiumTower* reduces the total system cost by eliminating the need for external battery chargers.

The company also claims that high efficiency of 96.6 per cent in double conversion (VFI) and 99.4 per cent in *Ultra-safe ECO* mode guarantees maximum energy savings and the lowest TCO.

CENTIEL says the *PremiumTower* provides unity power factor output (kVA/kW) which avoids the need for system oversizing to support today's power factor corrected loads.

CertaUPS describes its *C400R* series as a "versatile, high-power density" UPS solution suitable for server environments, IT facilities and the telecoms market.

The company claims the new line-up has been designed to deliver maximum user flexibility.

It says the compact and ergonomic rack mountable and floor-standing design makes it an "ideal fit" for many server cabinets, where it only takes 2U in height even with 2000VA and 3000VA configurations. Rackmount rails are included for what the firm says is "easy installation", and the LCDs can be rotated.

There are six models to choose from that offer various runtimes and battery

capacities. All of them feature on-line double conversion for continuous power protection, as well as support for 1000-3000VA loads.

CertaUPS says other key features include high efficiency up to 95 per cent, 0.9 output power factor, and expandable runtime with additional battery modules.

The company adds that each device also offers energy saving and eco mode functions, pure sine wave output, and HID functionality. They also feature interactive software which is said to be compatible with a wide range of operating systems.

Riello UPS' latest devices include the *Next Energy* and *Sentinel Dual* range.

According to the firm, the *Next Energy* 250-300kVA UPS is a "high tech solution designed to meet the power requirements of tomorrow", offering high efficiency of up to 97 per cent and low running cost.

It has transformerless double conversion technology at VFI SS 111 classification, integrated IGBT three-level design, and an in-built energy control system as standard.

Riello claims the *Next Energy*'s high-quality components help to guarantee "first-class" performance, such as unity power factor (kW/kVA), and support the capability to supply capacitive loads, as well as easy system upgrading.

It adds that the UPS is designed with the

latest technology to not only prevent disturbances on the mains, but also to clean the power supply.

The *Sentinel Dual* range is available in 5-6-8-10 kVA/kW models with on-line double conversion technology (VFI). Riello says the load is powered continuously by the inverter which supplies a sinusoidal voltage, filtered and stabilised in terms of voltage, form and frequency.

The UPS can be used as a floor-standing or rack model. Up to three systems can be operated in parallel in either capacity or N+1 redundant configuration for increased reliability and performance, with full front access and back-to-back install.

The *Liebert EXS* is the latest addition to **Vertiv**'s UPS range.

The company (formerly Emerson Network Power) says the new device is an "extremely compact", monolithic, transformer-less model that provides very high density and the maximum active power possible up to 40ºC.

Vertiv adds that the *Liebert EXS*' double conversion efficiency of up to 96.2 per cent also significantly reduces TCO and environmental impact. Eco mode is said to offer up to 99 per cent efficiency.

Initially available in 10-20kVA, it's claimed the 300 x 335 x 650mm UPS has the

smallest footprint on the market within its range. Vertiv reckons this is up to half of the size compared to the competition.

According to the firm, the compact design achieves optimised battery configuration as it can house up to four battery strings. It says this eliminates the need for external battery housing which reduces overall installation costs and floorspace.

Among other features are parallel capability for added capacity or redundancy, unity output power factor, intelligent battery management, etc.

Like all Vertiv UPS systems, the *Liebert EXS* can be used with the company's remote diagnostic and preventive monitoring service as well as its *Trellis* DCIM platform.

MEF launches SDN/NFV certification

Following a successful beta-exam review period, MEF (Metro Ethernet Forum) has now released its SDN/NFV professional certification. The industry association claims this provides the first industry-wide certification that validates a professional's knowledge, skills, and abilities in the two technologies.

With the help of SDN and NFV subject matter experts around the world, MEF says it built the certification exam to exacting ISO 17024 quality specifications for accuracy and reliability.

It says the exam is built around the key themes of 'Design', 'Deploy' and 'Manage', and details and references are contained in a newly released examination blueprint.

Professionals seeking to validate their competencies must be able to demonstrate their abilities in various design, installation and security scenarios involving SDN, NFV, and instances when virtualised objects such as VNFs are deployed into SDN architectures.

MEF has announced that five of its accredited training providers are already prepared to deliver training in preparation for taking the exam and will be offering classes in the weeks ahead. They include Carrier Ethernet Academy, Criterion Networks, Perpetual Solutions, SDN Essentials, and Tech2000.

The forum adds that it will host an SDN and NFV webinar on 10 July. MEF VP Dan Pitt and Metanoia analyst Vishal Sharma promise a wide-ranging discussion about the future trends for SDN and NFV, including the challenge of upskilling the existing workforce to be more proficient in these technologies. *http://www.mef.net*

UK set to be artificial intelligence leader

Imperial College London is the nation's most active creator of jobs in artificial intelligence, according to figures released in early June by Indeed.

The company, which claims to be the world's biggest job site, said that one in every 13 AI vacancies it listed in the UK over the last 12 months was at Imperial.

Indeed said four out of the country's top six recruiters of AI professionals are universities, and as well as Imperial they include Oxford, Cambridge and University College London. Global tech companies such as Amazon and IBM also appear among the top organisations advertising AI roles in the last 12 months.

The firm added that its data shows AI skills are more in demand in the UK than in any other developed economy, with the appetite among British employers even "outstripping that of their US counterparts".

Indeed said its UK site is currently listing three times as many AI vacancies as it did three years ago. Typical roles include machine learning engineers and software developers. The company said that as is common in the AI sector, the level of technical expertise and experience required means workers can expect to be well paid; for example, the average annual salary for a machine learning engineer is £54,739.

Shawn Bose, general manager at Indeed's online career platform Prime, believes the UK has emerged as a world leader in the creation of both AI technology and jobs.

He says: "It's striking how many AI jobs are being created by universities. With AI technology still in its infancy, academic researchers are racing to discover its full potential. Just as the genesis of Silicon Valley came when the worlds of scientific research and business collided at California's Stanford University, we could be seeing a similar pattern beginning to emerge with AI in the UK."

IN BRIEF…

■ Audinate's *Dante Certification Level 3* course is now available online. The advanced level programme is aimed at those who have already been using Dante and want to gain more insight and knowledge in setting up and managing larger Dante-enabled networking systems. It delves deeper into various advanced networking concepts, mixed-use networks, networking best practices, and troubleshooting techniques. The online version of the course is designed so that it can be taken in short modules. *www.audinate.com/cert-info.*

■ The IoT Global Network (IoTGN) says it has launched the "ultimate" handbook for getting IoT connectivity right. The organisations says *Into The Stratosphere* is for those who are serious about gaining a competitive edge and generating new revenue streams whilst accelerating their digital transformation. The guidance is presented as a set of reports focusing on the future of wireless communications. Topics covered include the future of cellular for IoT; enhanced Machine-Type Communication (eMTC); case studies; and more. *www.iotglobalnetwork.com*

■ QA has teamed up with Siker to boost its cyber security training portfolio. The two companies say they will work together to provide "market-leading" industrial control systems (ICS) security courses to help UK organisations and prevent cyber attacks. With offices in Buckingham and Dunfermline, Siker's ICS security courses are said to be highly regarded in the oil and gas industry, and are accredited under the GCHQ certified training scheme. QA says the partnership will provide its 6,000-plus customers with direct access to a wider team that has an "exceptional" record in the provision of high quality ICS cyber training.

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