

networking

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Emergency service

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HSCN “incredible opportunity” for all network vendors

By Rahiel Nasir

Despite warnings that the NHS and its suppliers were not ready for the new Health and Social Care Network (HSCN), progress is now said to have exceeded expectations.

In March 2017, BT's contract to supply the NHS' N3 network came to an end. Work on developing its replacement began in 2014. But last year, some industry experts expressed concerns about whether all parties were ready for the transition to HSCN (*see News, Oct 2016 issue*).

Five months after the end of N3, NHS Digital's website says there are now 21 suppliers that have achieved, or are in the process of achieving, HSCN stage one compliance – that's better than expected as the original target was to have around eight suppliers by this time. Interoute, KCOM,

TNP and Updata are among some of the companies currently on the list. Other suppliers, including Gamma Telecom, Maintel, Vodafone and Telefónica/O2, are in the process of starting compliance.

Innopsis – the industry association for suppliers that provide network services to public sector bodies – worked with NHS Digital to create the obligations framework for HSCN. Its director Michael Bowyer says there's been a great deal of background activity to ensure that all the infrastructure is working.

He says: "The first layer ensures that there are common peering points established for HSCN. These are where all the consumer network services providers (CNSPs) actually interface and interconnect.

(continued on page 2)



HSCN is thought to be the largest network infrastructure programme the UK will see over the next few years, potentially supporting up to 100,000 connections across the public healthcare sector.

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Over a quarter of data centres aren't ASHRAE compliant

Almost eight out of ten UK data centres are currently non-compliant with recent ASHRAE thermal guidelines for data processing environments, according to EkkoSense.

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) suggests that simply positioning temperature sensors on data centre columns and walls is no longer enough, and that operators should as a minimum be collecting temperature data from at least one point every three to nine metres of rack aisle.

In what it claims was the industry's largest and most accurate survey into data centre cooling, EkkoSense analysed 128 data centre halls and more than 16,500 equipment racks. The Nottingham-based thermal risk specialist found that 11 per cent of IT racks in the halls were actually outside of ASHRAE's recommended inlet temperature range of 18-27°C. It also discovered that 78 per cent of data centres had at least one server rack that lay outside that range – effectively taking their data

centre outside of thermal compliance.

James Kirkwood, head of critical Services at EkkoSense, says the problem for the majority of data centre operators that only monitor general room/aisle temperatures is that average measurements don't identify hot and cold spots. He says: "Without a more precise thermal monitoring strategy and the technologies to support it, organisations will always remain at risk – and ASHRAE non-compliant – from individual racks that lie outside the recommended range."

Given that UK data centre operators continue to invest significantly in expensive cooling equipment, EkkoSense suggests that the cause of ASHRAE non-compliance is not one of limited cooling capacity but rather the poor management of airflow and cooling strategies.

Kirkwood adds that the introduction of IoT-enabled temperature sensors is likely to prove instrumental in helping organisations to cost-effectively resolve their non-compliance issues.

"Incredible opportunity" for vendors

(continued from page 1)

"Redcentric was awarded the contract. They have built the two peering points and the platform is now up and running. And we even have the first pilots of CNSPs actually connecting to those peering points to prove that their service model actually works (this is part of the accreditation process)," Bowyer says.

He goes on to explain that as CNSPs connect to the peering point they pay a small levy which basically helps to return the cost of standing up the infrastructure. "So as we get more CNSPs using that peering point and get traffic whizzing over them, it becomes a self-funding activity which is an ultimate goal for NHS Digital."

Other core HSCN suppliers include Computacenter which will take care of network analytics. And Capita Business has been awarded the Advanced Network Monitoring (ANM) services contract. It will be responsible for inspecting all internet traffic from connectivity suppliers, instantly blocking any known malicious content. The ANM is currently in development and will be tested during September 2017.

Bowyer says HSCN is probably the largest network infrastructure programme the UK will see over the next few years, particularly because it is part of the government's integration programme to link all social and health care services. "The N3 replacement involves around 35,000-40,000 connections. If you include social care as well, that potentially means 75,000 to 100,000 connections consuming HSCN services over the next few years. That's an incredible opportunity for all network vendors."

He adds that HSCN is a totally cloud-based model which will make it easy for end users to consume more services as required as well as encourage innovation. "We are already starting to see suppliers looking at SDN for a lot of HSCN connectivity which offers a lot of options such as Wi-Fi, internet, private WAN, or even a hybrid of all of that plus satellite. I believe it will be the smaller vendors that will be the most innovative in their approaches because they are quite quick with new technology, and can hit the requirements easier than by offering a traditional MPLS WAN solution, for example."

Bowyer says most of the pressures are now on suppliers to ensure that they are ready to meet the demand and can provide consistent deployment capability.

On the network side, he says while there are now no issues, there are still some NHS organisations on N3 who are being moved to a 'transition network'. This is a three-year struck agreement between NHS Digital and BT which enables continuity of service for such users. However, Bowyer points out that the overall aim of the contract is to aid migration to HSCN. "That means we have to get absolutely everybody off the transition network within 34 months. I am totally confident that that will happen."

Innopsis director Michael Bowyer:
"We are already starting to see suppliers looking at SDN for a lot of HSCN connectivity."



Frequentis supplies huge control system for ambulance dispatchers

In what's described as the UK's largest integrated command and control system (ICCS), the Department of Health has selected Frequentis' 3020 LifeX as a replacement for its current platform.

The new software system will have a capacity for almost 700 concurrent users. It will be hosted at Crown Hosting Data Centres to provide a highly resilient national solution for all ambulance trust control room operators in England, with an option to include those in Scotland and Wales.

Frequentis says 3020 LifeX will not only allow control centre staff to communicate with ambulances on the current TETRA technology-based Airwave network, but also the new Emergency Services Network (see News, Jan 2016) once it is operational. The company says its platform will also provide a map-based view of all ambulance locations to complement current systems and provide another layer of resilience for the most critical of services.



Frequentis says more than 1,000 dispatchers worldwide – such as the Swiss police shown here – work with its system which connects telephony and radio functions with all associated data services.

According to Frequentis, this new approach to the provision of critical services for an emergency services' control centre allows for flexibility and innovation to meet any future requirements, such as the potential use of multimedia. The firm adds that even though the system is national, it will also ensure local requirements for individual trusts are also catered for.

Robert Nitsch, public safety director at Frequentis, says 3020 LifeX's 'private cloud' infrastructure, intuitive web-based front-end, and ability to integrate numerous third-party systems means a single national solution can meet the specific needs of individual ambulance trusts. "This brings the benefits of scale without compromising the individual's needs," he says.

Jisc to boost internet connectivity with GTT

GTT Communications will deliver high-speed internet services to the UK research and education network, Janet.

The company says its "resilient" internet connectivity solution for Jisc "guarantees" ultra-high network availability, interconnecting via three geographically separated points of presence.

Janet supports around 18 million students, researchers and academics in the UK. Under the initial service agreement, GTT will provide up to 120Gbps of internet

capacity with the opportunity for further upgrades as user demand increases.

The Janet network is also the UK operator for eduroam, the international roaming service for the education community that supports more than 70 million users globally.

"GTT is an ideal partner for Jisc, providing us with the comprehensive global network reach, scalability and flexibility that we require as we grow," says Tim Kidd, executive director, Jisc technologies.

US-based GTT delivers internet services over a Tier 1 worldwide IP backbone which it claims is ranked in the global top five, and says it has more than 300 points of presence.

Over the last few months, it has been continuing to expand with various multi-million dollar company acquisitions such as network connectivity solutions provider Global Capacity, high-speed network connectivity specialist Perseus, and Hibernia Networks which was bought in a \$590m deal last November.

Cisco joins City of London Wi-Fi project

O2 has chosen Cisco as its project partner to rollout free, public access Wi-Fi in the City of London.

Earlier this year, the City of London Corporation named Cornerstone Telecommunication Infrastructure (CTIL) and O2 as the companies that will introduce and manage the network (see News, April 2017 issue). The multi-million pound project will be one of the largest investments in wireless infrastructure ever seen in the capital.

This latest development will see Cisco deploying next-generation outdoor access point technology to offer internet connectivity to more than 400,000 people working in the Square Mile. The company will deploy its Aironet 1560 Series and claims these will provide the throughput capacity needed



Cisco says its Aironet 1560 Series APs will provide the throughput capacity needed for the network.

for today's bandwidth-hungry devices. Combined with O2's network, it says the technology will deliver the flexibility to balance the demand for wireless coverage with seamless deployment.

By utilising Cisco's technology, the

partners say their aim is to build a network that is more technically advanced than those found in other leading global financial centres, such as New York and Singapore.

"Continued investment in infrastructure is essential to maintain the UK's reputation as a digital leader, and we needed a partner that would be able to provide cutting-edge technology to help us realise this," says O2 COO Derek McManus.

Cisco believes that free Wi-Fi connectivity is now a pre-requisite for any city looking to drive innovation and compete on a global scale.

The project will replace the current Wi-Fi service provided by The Cloud, and is expected to be fully operational by Autumn 2017.

Church Army revolutionises IT operations

Church Army has modernised its entire IT infrastructure to support its remote workers throughout the UK.

Given its large number of sites and the variety of projects being worked on at any given time, the charity was finding it difficult to provide the highest level of IT support to its workers. As a result, it turned to Redpalm Technology Services to update the entire infrastructure and deliver a complete range of managed services.

The project encompassed an investment in IaaS to bring about flexibility in cost and compute resource for application hosting

whilst guaranteeing user experience. Church Army benefitted from the utilisation of VM hosting in Redpalm's redCLOUD platform, and the project also encompassed a desktop and devices refresh.

"We were tasked not only with modernising the core infrastructure, but also with creating a modern, remote support centre entirely hosted in our private cloud," says Olly Cogan, CEO, Redpalm. "Before the implementation, engineers would have had to travel to a specific location in case of an IT failure, and software updates had to be carried out

manually as opposed to systematically across the entire organisation."

As part of the overhaul, Redpalm used several components from Baramundi Software's Management Suite to provide the level of automation needed and meet the highest security standards. Sean Herbert, country manager for Baramundi Software UK, adds: "By being able to manage and oversee the entire business IT landscape, administrators can now effectively address IT issues as they arise, plug security gaps as they emerge, in addition to providing complete control of the IT landscape."



THE WORLD ACCORDING TO...

Ed Thewlis, MD, DataShed

What's in a name?

The world of data is relatively new and we're all working out how to find our way in this increasingly important and complex area of business and technology. However, one area which is making this more difficult than it needs to be is what to call the people who manage it.

There is a desire to gravitate towards the 'rockstar' job titles that are used by the likes of Google, Facebook and other massive data organisations, where job titles such as 'data scientist' and 'data engineer', are appropriate.

In an effort to emulate these organisations, other companies have now begun re-labelling perfectly valid job titles. This is causing significant challenges for the data industry. Not only do businesses need to find people who can help them make sense of their data, and then start to use it to drive better understanding of customers and the marketplace, now they also need to decipher the random allocation of job titles, as well.

For instance, taking a 'management information analyst' who was building simple reports as recently as two years ago and calling them a 'data scientist' is madness, as they typically lack the necessary skills to perform the role. A data scientist needs

to be able to operate at a strategic level within an organisation, utilising all the data available to them and applied statistics to model and predict outcomes and events, and then building propositions to help shape the future of the business.

Similarly, calling a 'database administrator' a 'data engineer' generates further issues. Someone who is experienced in making sure that core business systems are working and optimised does not necessarily have the necessary skills of a data engineer. The latter is someone, who must be able to understand the operations of a business through the data it holds, write complex data pipelines in a variety of languages, and produce modelling so that analysts and data scientists (note the distinction) can utilise it.

For someone who works in the data industry every day, it's confusing; for businesses seeking to start making use of their data, it must be absolutely baffling.

It's time to start revisiting some of the less fashionable job titles like 'management information analyst', 'ETL engineer' and 'credit risk analyst', and do away with the sexier-sounding but much less meaningful 'rockstar' ones once and for all.

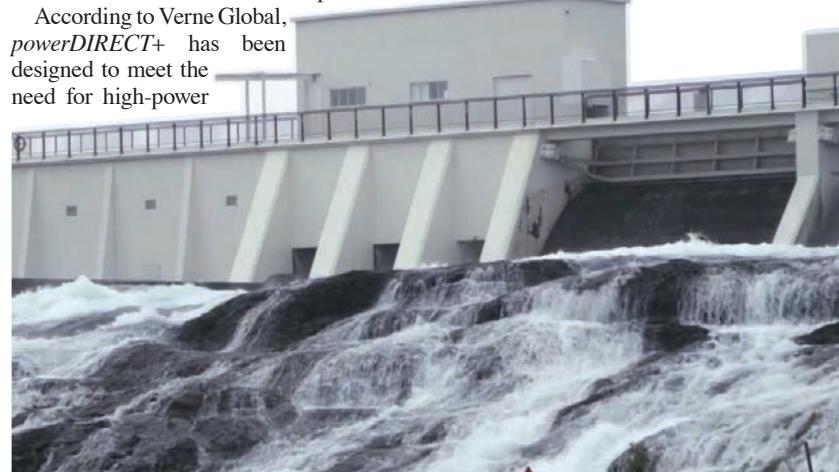
Verne Global gears up for next-gen power computing

Verne Global reckons it has broken the decades-old model of one-size-fits-all data centre design with *powerDIRECT+*, its reduced-cost environment engineered specifically for next generation power intensive computing.

With *powerDIRECT+*, the company says it's expanded its compute environments to equip CIOs with "streamlined and cost-effective" data centre options.

Verne Global says it specialises in highly-optimised, secure, scalable and 100 per cent renewably powered data centre solutions. The firm claims its Icelandic campus is the only place in the world where a data centre can operate with totally sustainable green power. Located on a secure, former NATO base close to the town of Keflavik, the facility is said to support more than 60,000m² of ISO 27001 certified, technical space.

According to Verne Global, *powerDIRECT+* has been designed to meet the need for high-power



Verne Global says its Iceland campus is in the only place in the world where a data centre can operate with totally sustainable green power.

HNS and ITS to help Bristol cash in on B-Net

Hub Network Services (HNS) has been selected as the wholesale provider of Bristol City Council's B-Net ducting and fibre communications network.

B-Net (Bristol Network) is owned by the council and was purchased more than 15 years ago from cable TV pioneer Rediffusion. It is part of the municipal authority's objective of leveraging its existing duct infrastructure for providing commercial services across an area that directly contributes to economic growth. As a revenue sharing initiative, a proportion of the income received by the council from businesses using the B-Net service will be used for the funding of other local services.

Stretching around 80km in length, the network already covers most of Bristol, extending from Filton in the north to Keynsham and Long Ashton in the south. With plans to expand the footprint by an

additional 96km in the near future, it's claimed businesses further afield can also expect to benefit from having low latency FTTP connections.

HNS has been appointed by the ITS Technology Group, a nationwide public sector IT services company that has agreed a 20-year concession with the council to develop B-Net. The two firms will work closely together to make affordable, secure, high-speed Gigabit internet connectivity easily accessible to local businesses.

ITS adds that the partnership with the council and local network and IT specialist HNS will support local regeneration initiatives. Mike Jones, ITS' head of major projects, says: "This will build on the excellent work the council is doing to become a 'smart city' using technology to solve some of the road blocks preventing the city in achieving its full potential." ■

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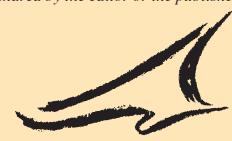
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Mitel to acquire ShoreTel

Mitel proposes to buy ShoreTel in an all-cash transaction at a price of \$7.50 per share, or a total equity value of around \$530m and a total enterprise value of around \$430m. The combined company will be headquartered in Canada. It will operate as Mitel and led by its current CEO, Rich McBee. On closing of the proposed transaction, the combined company will have combined sales of \$1.3bn, and more than doubles Mitel's UCaaS revenue to \$263m. It will have a global workforce of around 4,200 employees, and Mitel adds that there is a "significant synergy opportunity" targeted at \$60m in annual run rate spend expected to be achieved over two years. ■

OVH launches first UK data centre

OVH, which claims to be Europe's largest cloud hosting provider, has now opened its first UK data centre as part of an ambitious €1.5bn global expansion plan. After Australia, Singapore, Poland and more recently Germany, the France-based firm's new south-east London facility is the fifth data centre it has launched in less than a year. The site, previously owned by a telecoms operator, is situated near two substations and was also chosen due to its proximity to OVH's PoP in nearby central London. It houses 40,000 servers and has been built using components engineered by OVH, including a recently installed water-cooling system. OVH says it currently now has more than one million customers that use its 22 data centres across the world. ■

TFM Networks buys Tru Solutions

After receiving £4.5m of funding from Santander, TFM Networks has acquired Derby-headquartered B2B mobile communications provider Tru Solutions. TFM says it can now offer a full portfolio of fixed, mobile, voice and data communications services, as well as an enhanced suite of products, to an enlarged customer base. Founded in 1995, TFM builds customised private telecom networks and has developed its own MPLS network which it says is designed to converge customers' legacy voice and data networks on to a high performance single platform. The firm has expanded in recent years with the acquisition of Conexion Communications in 2012 and Waveworks in 2013. ■

Gigaclear helping bring Berkshire up to speed

More than 6,000 homes and businesses in rural East Berkshire will be given access to Gigaclear's ultrafast, full fibre broadband network.

As part of the latest phase of the *Superfast Berkshire* project, the company has been awarded the contract to help extend better broadband coverage to more than 99.5 per cent of the county over the next two years.

The contract, awarded by West Berkshire Council under its phase 3 programme, means that premises will have access to speeds of up to 1,000Mbps. Gigaclear also

works with *Superfast Berkshire* under the phase 2 contract to connect nearly 12,000 homes and businesses in West Berkshire to ultrafast broadband (*also see News, Jul-Aug 2015 issue*).

Construction of this new FTTP network is expected to start in rural East Berkshire later this Summer.

Founded in 2010, Oxfordshire-based Gigaclear says it is dedicated to building and operating ultrafast, pure FTTP broadband networks in rural Britain.

The company says it has so far delivered fibre to more than 48,000 properties



To date, Gigaclear has delivered FTTP to more than 48,000 properties in rural parts of Devon, Rutland, Somerset, and many other counties.

across Berkshire, Buckinghamshire, Cambridgeshire, Devon, Essex, Hertfordshire, Gloucestershire, Kent, Leicestershire, Lincolnshire, Northamptonshire, Oxfordshire, Rutland, Somerset and Worcestershire. ■

Sophos secures Konica Minolta's Workplace Hub

Konica Minolta will integrate Sophos' wireless systems and security platform into its *Workplace Hub*.

With its UK head office in Basildon as well as 13 regional offices across the UK, Konica Minolta provides a range of managed print services as well as software and technologies for business users and consumers. The company describes its recently announced *Workplace Hub* as an "innovative" IT solution for SMEs that integrates everything from basic office automation functions to security, IoT device management and data storage in a single platform.

Dennis Curry, executive director of global R&D and deputy CTO at Konica Minolta, says: "Workplace Hub not only

allows businesses of all sizes to achieve effective digital transformation but also future-proof themselves against the next wave of technology innovations."

Curry says what the company needed was a reliable yet simple security solution that could support its roadmap for future integration of IoT, AI and other mature capabilities as they become more central to future business environments.

According to Sophos, it was chosen because of its expertise in providing fully integrated, enterprise-grade solutions that are easy to deploy and manage for organisations without a large IT security team.

Konica Minolta will use Sophos' XG Firewall which, according to the vendor, offers many features that make OEM

integration simple and effective. Sophos says these include a flexible management interface that can be branded or accessed via APIs; multiple options for bundles, including email and web security, sandbox, next-gen firewall and wireless security; and an extensive sales training program to enable fast adoption within the sales team. The company adds that there are also "mature" support and integration processes, allowing partners to more quickly get to market.

"Due to its easy management and deep visibility into network activity, the XG Firewall is perfect for Konica Minolta's vision for the workplace of the future," says Francois Depayras, VP for global OEM alliances, Sophos. ■

Medical school cures infrastructure complexity

Liverpool School of Tropical Medicine (LSTM) will use a Scale Computing system to "dramatically" simplify its storage infrastructure and guarantee disaster recovery capabilities.

The school initially built its IT environment using a server *BladeCenter* chassis and SAN implementation based on Microsoft's Hyper-V failover cluster technology. However, the infrastructure was ageing and becoming increasingly difficult to manage.

Following a successful proof of concept, LSTM opted for Scale Computing's HC3 cluster as well as a disaster recovery cluster for high availability, cloning, replication and snapshots, providing



Scale says its HC3 platform has reduced management time by more than 50 per cent for the school's IT department.

complete business continuity.

Scale says its platform has reduced management time by more than 50 per cent, adding that its simplicity has allowed the school to focus on other areas of business, thus saving time and money.

"With Scale, we don't have to worry about the underlying operating system, this is all taken care of," says Matthew Underhill, IT team leader at the school. "Previously, if there was an issue with any of our servers, we had to spend hours troubleshooting. But Scale has completely streamlined this process and we don't have to worry about the everyday management of our systems."

HC3 has also delivered the added benefit of replication. Through regular snapshots, backup testing has become simplified, allowing the institution to guarantee business continuity. Underhill says that in the event of a disaster, VMs can be up and running again within five minutes. ■

Do you still need that Historic PBX? No, you don't!

Enterprise communications have long been primarily based on expensive appliance PBXs with a hefty physical infrastructure and full-time PBX administrator overseeing operation of the system. The workplace as we know it is changing, becoming more environmentally conscious and facing the needs of a new generation. As VoIP solutions become more widespread and reliable, enterprises are looking to make the switch to VoIP software systems in the hopes of reaping the same benefits that smaller businesses are enjoying while experiencing greater flexibility, scalability and cost-savings.

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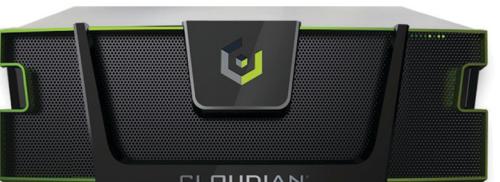
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Interoute deploys *HyperStore* for global cloud storage services

Interoute has partnered with Cloudian to provide what it claims is a fast and "very low cost" cloud-based storage service for unstructured data, backups and archives.

Interoute says it selected Cloudian's *HyperStore* object storage technology for its scale-out capabilities, S3 API compatibility, multi-tenancy features and ease of integration. The new service offers multiple petabytes of capacity, with further growth planned in accordance with demand.

The deployment is available across Interoute's entire cloud-based platform with 17 Virtual Data Centre zones globally. Customers have the option to use



Cloudian says its HyperStore platform leverages the industry's only 100 per cent native S3 API.

in-country deployments in Switzerland and Germany. Interoute says the geo-location flexibility offered by the solution in combination with its *Enterprise Digital*

Platform gives customers control over data locality and enables them to build regulatory-compliant storage solutions in different territories.

Mark Lewis, EVP products and development at Interoute, says: "With GDPR looming large in 2018, as well as the rapid adoption of VDC and SaaS platforms, our customers are revisiting the legacy world of physical backup and archiving and demanding a simple, controlled, auditable cloud service. So we've created an easily accessed and integrated, cost-effective object storage service to support their digital transformation."

ANS cloud covers cars, helicopters and boats



ANS will monitor the Maritime and Coastguard Agency's critical network infrastructure.

ANS Group has seen its services deployed from ship to shore in recent months, under two separate deals.

In early August, the Manchester-based cloud services provider announced that it will continue to work with the Maritime and Coastguard Agency (MCA) as part of a renewed managed service contract.

The MCA is maritime safety regulator and emergency response organisation that includes HM Coastguard. Headquartered in Southampton, it operates from a number of coastal outstations, and has 1,050 staff and 3,500 volunteer rescue officers.

ANS will be responsible for the MCA's infrastructure, providing round-the-clock support and management to facilitate the smooth running of vital emergency response services. It will deliver continual monitoring of the agency's critical infrastructure, which is built on the multi-vendor FlexPod system.

In a separate deal earlier this year, TrustFord has partnered with ANS in an effort to transform the performance of its network and IT systems with a new WAN.

The WAN will also deliver improved connectivity between TrustFord's 60 sites by enabling next-generation video conferencing applications and facilitating remote working. In addition, the cloud-ready network will deliver 'smart' car software updates to TrustFord customers.

Snowflake claims world first with data "sharehouse"

Snowflake Computing says it's come up with technology that turns a modern data warehouse into a data "sharehouse". According to the US-based firm, until recent years, enterprises could focus only on storing and analysing data generated inside their organisations. Then the internet, social networking, mobile computing and the IoT caused a surge in the volume, variety and velocity of available data. Unfortunately, technical and business limitations forced enterprises to focus on just a subset of that data, says the company.

Snowflake Data Sharing is said to enable businesses of any size to share their live, ready-to-use structured and semi-structured data, and consume the same types of data from other enterprises. Snowflake says that by using simple commands, an enterprise can share or acquire live and secure read-only access to any part of a data warehouse with and from other companies.

The firm claims its technology uniquely combines the power of data warehousing, flexibility of Big Data platforms, elasticity of the cloud, and live data sharing at a fraction of the cost of traditional solutions. Amazon Web Services is the company's infrastructure partner.

Among the benefits of data sharing, Snowflake says users gain direct and simple access to live data without the "intermediate, complex and delaying steps of outdated data sharing methods such as email, FTP, EDI and APIs". Enterprises are also said to benefit from a complete cloud sharing environment that eliminates the need and cost to store another enterprise's data.

The firm adds that no extra cost, copying or movement of data is required with its data sharing platform, and that the business agreements for sharing are between the providers and consumers with no involvement from Snowflake.



As well as protecting its end users and our data, the theatre needed to take employee behaviour into consideration as part of its IT security strategy.

National Theatre prepares for GDPR with cloud security system

London's National Theatre is using cloud-based technology as part of its IT strategy that is focused on protecting end-users and meeting the requirements of the General Data Protection Regulation (GDPR) that comes into force next year.

The theatre has replaced its legacy products with *Forcepoint Web Security Cloud* for what's claimed to be "up-to-the-millisecond" threat identification and user behavioural analysis. By aligning security technology and governance to process and educate users, the IT operations team is helping train and adjust human behaviour through continuous, but not intrusive, technical supervision.

Forcepoint says its solutions have helped the National Theatre's IT team better understand user behaviour and motivations in order to protect critical data, while ensuring employees could do their job without interruption.



VIEW FROM THE TOP
Hubert Da Costa, VP EMEA, Cradlepoint

If connectivity is key, is it time to go wireless?

In today's increasingly distributed enterprise, even short periods of network downtime can have an immediate impact on revenue and can leave a company exposed to a range of compliance, regulatory and security risks. Gartner estimates that every hour of downtime can typically cost an organisation \$300,000 per hour, but in severe cases damage to brand reputation and customer loyalty is incalculable.

The danger of a network outage due to a failure in internet connectivity is a real possibility for many enterprises – large IPSS offer just 98.5 per cent availability as standard, corresponding to a downtime of up to ten hours a month. The question is not if the internet connection will fail, but when.

There are a number of options available to help solve this problem.

Upgrading existing network technology, for example to T1 lines, can reduce downtime. But these do not offer enough bandwidth for most enterprises to run all of their day-to-day applications.

Installing wired redundancy solutions is another option but the implementation and maintenance of E1 or E3 lines is unaffordable for many. Crucially, most wired lines are laid in

the same trench and are subject to the same physical damage as primary WAN connections. Selling this option internally – particularly as a business continuity solution – will not be an easy task for many IT managers.

So instead, they should look to a wireless solution. Compared to wired failover solutions, wireless offers speeds fast enough to keep an enterprise network humming at a fraction of the price. The relatively low cost of 4G LTE for business continuity means IT teams can achieve a greater return, while meeting the scalability needs of a distributed enterprise.

A growing number of enterprises are also deploying 4G networks for permanent primary connectivity. Network managers are finding they can optimise and pool data usage among multiple distributed locations, deploy the network faster than the competition, and manage it all remotely to reduce the need for on-site support.

What's key is that this type of architecture is agile enough to be moved without running more cabling, making it possible to change direction without delay. In today's enterprise environment, wireless could be the perfect solution.

Arqiva does the Lambeth talk

McGlone. "This agreement will boost 4G where demand is particularly high, or where existing coverage is poor."

Arqiva says the contract with Lambeth is its 12th London borough concession, following similar wins in Barnet, Brent, Camden, Hammersmith and Fulham, Haringey, Harrow, Hounslow, Islington, Merton, Richmond upon Thames and Wandsworth.

The infrastructure specialist also has similar deals in Manchester, Southampton, Colchester, Eastbourne and Medway.

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Connecting a classic

Networking solutions in historic and listed buildings.

Wi-Fi in Art Deco former cinema

The Troxy Theatre first opened as a grand Art Deco cinema in 1933 with a screening of *King Kong*. Over the years, it's been used for different purposes, but in 2006 it became a space for live events with a capacity for around 3,000 people.

As a Grade II-listed site, there are tighter controls over what changes can be made to the building. In particular, locations for wireless APs are limited, as are the opportunities to install the cabling to connect them. In the past, there had been several attempts to build a wireless solution to remedy this problem. However, the assortment of individual broadband lines and routers from various vendors became unreliable, resulting in frequent outages.

Troxy's team tried different options, notably deploying line-bonding tactics which



involved linking broadband lines together for faster connectivity. But as the venue attracted increasingly high-profile corporate and live events, it soon became apparent that this organic design was no longer fit for purpose.

In 2015 a fibre line was installed and this needed to be accessible throughout the venue. The team also needed to be able to prioritise network bandwidth to ensure quality of service for event management staff and visitors.

There were four use cases a new network installation would need to support: connectivity for corporate hire; connectivity for the general public; private connectivity for internal teams; and connectivity for media companies.

IT services provider Connecting London worked with Zyxel to build an end-to-end solution for Troxy.

Zyxel's adaptive wireless technology, *Smart Antenna*, was used to maintain stable coverage for the high numbers of visitors in the main event area. In addition, various access points from the vendor were used throughout the building to ensure each area was covered.

All the APs are supported using Zyxel's PoE switches and a core firewall. These aim to provide a reliable network backbone to cope with the demands on security, network traffic and management, as well as seamless connectivity.

The APs are centrally controlled,

allowing the straightforward configuration of either individual or access point groups. According to Zyxel, this approach provides the flexibility to adapt the configuration to suit all users within the venue, while also eliminating the inherent technical complexity.



Keeping an eye on 19th century shooting lodge

Set in 58 acres of parkland at the end of a sea loch, the Torridon Hotel and Inn in Scotland was originally built as a shooting lodge for the first Earl of Lovelace in 1887. It is now a modern hotel with 18 guest rooms, multiple recreational areas, a famous whisky bar, and even has a biomass district heating scheme.

When the Torridon underwent a major refurbishment in 2015-16, senior management opted for what was at the time a well-regarded analogue CCTV system. But they soon discovered that compared to modern video quality the system looked pretty poor. It also included a separate video management and storage system which also incurred an additional licence fee for each additional camera.

What the hotel needed was an all-inclusive and high resolution system. But there were strict conditions around both the installation and physical appearance of the cameras. Parts of the building are nearly 150 years old, which means great care needed to be taken in terms of where cameras and cables were installed.

MD Dan Rose-Bristow says: "The system needed to be as least intrusive as possible as to not cause guests any discomfort yet still provide the level of security we required."

Local installer Ness Tec had experience of working in similar environments, as well as the expertise needed for carrying out the installation of new structured cabling that would replace the older coaxial cabling and separate power connectors.

Ness Tec recommended a MOBOTIX solution which impressed Rose-Bristow for its image quality, ability to use fewer hemispheric cameras to discreetly cover larger areas, and the fact that all the necessary software came without any additional licensing costs.

After conducting a full site survey, Ness Tec identified that complete site coverage – including thermal imaging cameras in the car park area and key entry points – could be achieved with just 20 MOBOTIX cameras.

By using the vendor's hemispheric technologies, large internal rooms could be covered by just a single camera. Installation was further simplified with PoE which was connected to a single UPS for increased reliability.

Torridon's facilities team can manage the cameras from multiple locations using MOBOTIX's *MxManagementCenter* software. This has an unlimited number

of connections and requires no additional fee. Each camera can independently record footage onto its internal flash memory card, and all recordings are stored securely on a Synology NAS server. The footage is accessible via *MxManagementCenter* through secure connections to any authorised playback devices such as standard PC or laptop.

Managed print masterpiece at National Gallery

Founded in 1842, the National Gallery in Trafalgar Square had a printing estate that had developed over time. As such, a lot of the hardware was old which meant that devices often malfunctioned. Their age also meant that it was a struggle to get the correct consumables. Printing is a large part of the gallery's business, but with its existing system making it very difficult for staff to print, scan or photocopy, a partner was needed that could solve all the problems while ensuring only minimal disruption.

Based in Buckinghamshire, IT infrastructure specialist Softcat offers a number of services including, amongst others, networking, security and printing. It suggested solving the gallery's issues with its *Managed Print* service.

The first stage of this was for Softcat to perform an audit on the current printing estate to assess exactly how the current system was being used. It found that the gallery was printing over 100,000 pages a month, which was a lot more than originally thought. It therefore became clear that a system was needed that would enable more accurate monitoring of printer usage. The costs of the current printing system were also analysed.

Softcat came up with a tailored managed solution and implemented a 'follow-me' printing system to make the entire architecture more secure.

Staff can now login to any printer and retrieve the documents they send to print. Documents are now much less likely to get stuck in the system and can only be retrieved by the person who printed them.

As part of the solution, the gallery's internal systems team now receives *SafeCom* reports which provide accurate information on printing, allowing them to start building a print strategy for the future.

The new system is said to be easier for staff to use and the new devices are also easier for the technicians to manage. Softcat says the helpdesk now receives far less calls about printer issues – previously 30 per cent of all calls were printer related.

Furthermore, Softcat provided a project manager onsite to manage and install all the devices and continues to provide support going forward with every aspect of the solution, from the consumables to the devices.



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Joining the dots



With billions of devices expected to populate the Internet of Things, RAHIEL NASIR wonders who is responsible for making sure they are connected, managed and delivering the data the end user needs.

You have probably heard all the headline-grabbing forecasts of the billions of devices that will be connected in the Internet of Things, and the trillions of dollars that the global market is expected to bring in for vendors, suppliers, network operators, etc. And you'll probably also be aware of the wide range of applications enabled by the IoT, from utility companies deploying smart meters and snacks firms monitoring their nationwide vending machines, to train operators managing their rolling stock and healthcare services keeping a remote eye on their patients. But in all instances, somebody has to take charge of running the network. So whose responsibility is it?

"In many ways, an IoT deployment is pretty much like the internet: it's a network of networks," says Chris Mason, EMEA sales director and VP of business development at US-based wireless network specialist Rajant. "What tends to happen is that network providers, or operators, or the owners of devices have a boundary of responsibility for the communication devices. If you look at the IoT like a Venn diagram, it is really a combination of individual owners making up the whole."

Telensa, the UK firm that provides wireless smart city control systems, is likely to agree here. Its VP of marketing Keith Day says: "There are a broad range of different networks covered under the term 'IoT', and the ownership and responsibilities for these paints a pretty diverse picture. Telensa's focus is on smart cities. Here, responsibility is split between the city or municipality operations department, their contractors and the owners of the infrastructure."

Earlier this year, Day published a blog that highlighted the rise of the "chief data officer". He wrote that the idea of a smart city is based on the collection and analysis of Big Data, and if municipal authorities are to embrace the idea of "data-driven government", they need to appoint CDOs to navigate their path to becoming a successful smart city.

While the idea of a CDO may be taking-off in US cities such as Chicago and New York which are said to have pioneered the role, in the UK there seems to be stricter demarcation around job titles such as 'data scientist', 'data engineer', 'data administrator', as Ed Thewlis of the DataShed suggests (*see p3, What's in a name?*).

Other industry experts point out that for those companies who use cellular networks to connect their devices, the responsibility for managing the network is the mobile operator they have chosen. For instance, Greg Aston, product director at ETI Software Solutions, says: "Most of our IoT customers are currently using GSM-based networks and expect them to 'just work' in the same way you would for your mobile phone service."

Whoever assumes responsibility for the network, one thing is clear: connectivity is key. As Theresa Bui, Cisco's director of IoT strategy, points out: "It doesn't matter how good the hardware of the device is, or how sophisticated the application or firmware that sits on it is – without connectivity, nothing is happening with that device. Connectivity is what turns a 'thing' into something that offers a continual service."

US-based IoT platform provider Essence says all IoT network applications are just part of a larger system. As a result, the

ultimate responsibility for their integration and ensuring that they run smoothly falls within the remit of an organisation's IT functions. But Rafi Zauer, the firm's head of marketing, adds that many, if not most, services are based on a cloud-based model. "In these cases, service providers (the customer) have an SLA with the technology vendor who are committed to 100 per cent uptime with 24/7 support. So it falls to the vendor to ensure that their systems are always working."

Rittal highlights the first of many challenges here. Barry Maidment, the company's south division IT sales manager, warns that as the IoT gathers pace, millions of machines, gadgets and household items are sending small packets of data to the cloud every second of the day. "The speed at which the data travels is dictated by the bandwidth and it is increasingly becoming overloaded," he says. "Anyone whose business is totally dependent on the cloud needs full connectivity without internet interruption or downtime."

Making the net work

Cisco's Bui has already mentioned the importance of connectivity, and adds that an IoT network has to be able to provision, allow and monitor a connected device's behaviour. If it can't do that, it's basically useless.



"It doesn't matter how good the hardware of the device is, or how sophisticated the application or firmware that sits on it is – without connectivity, nothing is happening with that device."

Theresa Bui,
Director of IoT strategy,
Cisco

"When you are responsible for the network, you have to ensure that each and every device can connect to the network when, where and how often the users expect it," she says. "For example, a smart gas meter may only be expected to connect once every 24 hours, from a single location, and pass 19 kilobytes of data. But a car may be expected to connect to a network several hours per day, across different geographic zones (even countries), and pass hundreds of megabytes per day."

Bui goes on to say that when it comes to connecting their assets for the first time, those responsible for the IoT should watch out for not being able to map connectivity to the device's lifecycle. She says this could result in paying for needless usage prior to a go-live at a customer site, as well as unreliable connectivity at first use at the site. To help overcome this, Bui recommends device makers to enable some connectivity capabilities during manufacture so that the unit can be tested. There should then be no connectivity during shipping and distribution, but once the device arrives at its destination, it should have the ability to connect to the right network and start working immediately.

It is also crucial for users to establish what constitutes an IoT device's 'normal' network behaviour. Without this, companies could end up with potential security risks and higher operational costs. "Establish the baseline for what is standard network behaviour for your devices so that you can be alerted from deviations from the norm to prevent cost overages and mitigate against potential security risks," advises Bui. More on all that later.

For Rajant, Mason says enterprise users should begin their process of using the IoT by asking themselves what they want to achieve with all the data that will be gathered. He then emphasises that the technology deployed will always be a hybrid solution.

"It's a combination of components – it may be components of our technology, someone else's technology (such as an enterprise Wi-Fi provider), and a supplier

of some low powered devices. So you have the devices, sensors or something generating a piece of data that needs to get a short distance from the critical environment in which it works to the point of collection.

"Then the data is aggregated, and transmitted to reach the point of analysis which may be far away or local. We will just work to make sure that there is no barrier to the transmission of the data, and that its actual value is clearly understood by all parties, because that also determines other aspects that you put in, such as resilience, security, latency and multiple paths out. The end application always determines the components that you will need."

Steve Bailey, MD at infrastructure and technical services specialist AIT Partnership Group, flags another potential problem with IoT projects: "Organisations are usually structured in silos with a facilities team and an IT team. Running an IoT network may require knowledge of protocols not familiar to IT teams such as BACnet and Modbus if legacy sensors, meters and assets are to be connected. Knowledge of M&E plant and where to place sensors and meters is usually a facilities role."

As a result, Bailey says an IoT project will require close cooperation between the two teams, and that both may have to allocate budgets which can be a problem in some organisations. "It can be expensive to roll out an IoT project. You need a good ROI – 'nice to have' and woolly ideas don't get off the ground."

Telensa's Day also expresses concerns about costs. He says that while the technology for smart cities and private IoT networks may be very similar, the way the funding is structured is "wildly" different.

"Enterprise networks benefit from generous funding from the organisations that build and host them, and cellular networks benefit from individual subscriptions. But IoT networks have to operate at very low margins because each connected device tends to only make a very small cost saving or revenue contribution.

"So you need to make the economics stack up. The challenge is how do you design an IT infrastructure, both network and applications, that will fit a highly constrained business case. How do you take cost out of the arrangement?"



"We frequently find all the networks with username 'admin' and password as 'password', and it has been that way for 20 years."

Chris Mason,
EMEA sales director & VP of business
development,
Rajant Corporation

"The sheer volume of devices means that things have to be automated. And you need to take people out of the equation in terms of managing these things – both from a purely practical basis, but also from a cost perspective."

Beware deviant devices

Automation is clearly a crucial aspect of the IoT. ETI's Aston reckons that there is an expectation amongst users that everything will be plug and play: "In the consumer market, every new gadget that you purchase tends to require less user intervention to get online and functioning, so this experience is expected with a wide range of device types. This leads to the challenge of ensuring your infrastructure is as tightly integrated as possible and making sure you take advantage of automation wherever possible."

Cisco agrees here when it says companies need to be able to monitor and control their devices in real-time. Bui says: "Since no company has the resources to manually do that, they need to be able to automate most of the connectivity management of their IoT devices. Look for a solution that enables you to simply type in your device's standard behaviour."

As examples of this "standard behaviour", she says the IoT devices users deploy in a particular country should only work in that country, connecting once per day and with each session lasting no more than two minutes. They should pass about 2MB of data per month. "If any of your devices deviate from that pattern, disconnect them off the network and send a security notification to the support team. If the devices connect more than ten times per day, send an SMS to the operations team lead. And if they are passing more than 10MB per day, disconnect from the network and send an email to the operations team.

"Automating the connectivity management during a device's lifecycle will ensure companies can scale their deployments quickly, ensuring reliability, minimising security risks, and all while lowering operational costs."

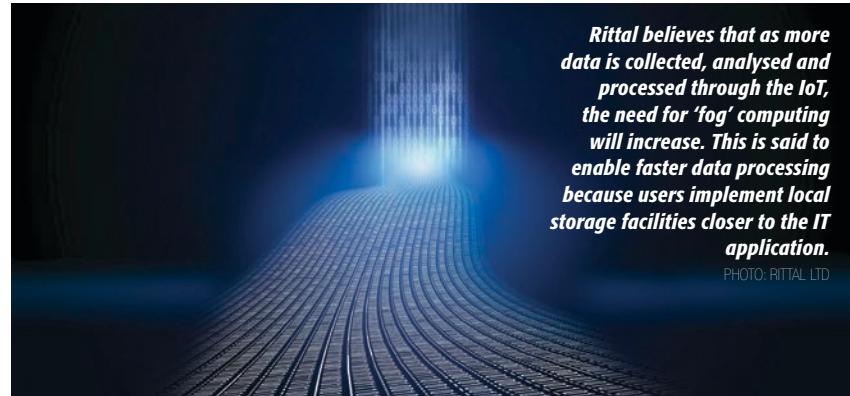
Day lends his weight to the argument by saying that in the IoT space, wireless networks must be designed to operate over wide areas and run over decades with little intervention. "It's also critical to have a lot of resilience built in, all while still being delivered and maintained at a low cost."

When it comes to resilience, Rittal reckons one of the solutions that could be key is 'fog' computing. Maidment says that while cloud computing offers processing power and storage capabilities that few organisations can match and for a relatively low cost, bandwidth remains an issue. He explains that principle of fog is quite simple – it describes temporary storage and processing capability closer to home/the application.

"Essentially, fog computing is a relatively small computer that gathers, caches and feeds data into and out of the giant servers in the cloud. The term 'fog' was apparently coined because it describes something closer to the ground and nearer the application. The 'cloud' by contrast is a distant facility.

"Fog computing is inclined towards an element of local processing and storage. What's more, it builds greater resilience into the system and gives greater protection to the most sensitive data."

According to Maidment, data processing is faster when a business has local storage facilities near the IT application. "When time is available, it then passes the consolidated data to the main cloud. The great advantage of fog, particularly for business critical functions, is that if your connection to the internet goes down



Rittal believes that as more data is collected, analysed and processed through the IoT, the need for 'fog' computing will increase. This is said to enable faster data processing because users implement local storage facilities closer to the IT application.

PHOTO: RITTAL LTD

and contact is lost with the cloud, you can still function as a business. It builds resilience into the system. And as more and more data is collected, analysed and processed through IoT, so the need for fog computing will increase."

According to Aston, ETI can help overcome such challenges because of its Beamfly service and the software it provides in the IoT market. He claims the company has a "long history" of integrating systems to its core product, and ensuring there is a single touch point for users that can trigger coordinated interaction with a wide range of systems, such as billing, network provisioning, device management, etc.

But AIT's Bailey advises against going for a proprietary software solution. Instead, he says users should choose one that can collect from the widest possible number of protocols. "Think about the future and consider building-in control features of IoT devices as well as data collection. MQTT is becoming ubiquitous but you may also need to connect to EnOcean, Modbus, LONworks, BACnet, SNMP, etc."

Standards and protocols

There are several IoT technologies for connecting devices over long distances without internet connections.

For instance in the UK, Arqiva is using Sigfox's platform for its IoT network that was claimed to be the first in the country when it was first announced three years ago (see *News*, December 2014).

LoRaWAN is another system and is being promoted by the LoRA Alliance. It is an LPWAN (low power wide area network) specification intended for wireless battery operated 'things' in a regional, national or global network. *Networking+* did invite the alliance to participate in this feature but no reply was received.

Weightless is yet another M2M/IoT technology standard that has been around for a while now. Developed by a special interest group (SIG) whose board members include Accenture, ARM, Sony Europe and Ubiik, the latest version of the standard was officially launched in early August 2017.

Weightless-P is an open standard for a high capacity LPWAN that is designed for performance. According to the SIG, when IoT connectivity technologies are being considered, users factor in parameters such as cost, battery life and range. It says while this is not wrong, it's easy to overlook the importance of network capacity. "Capacity is not just about the number of simultaneously connected nodes," states the group. "It is about mean data packet length, transmission time, frequency of transmissions and interference mitigation."

Alan Woolhouse, chair of the Weightless SIG, says Weightless-P is narrowband modulation scheme technology while LoRaWAN is a spread spectrum technology. "What that means is a LoRa data packet occupies the entire bandwidth available in ISM [industrial, scientific and medical] spectrum, whereas a narrowband scheme communicates in narrow channels.

You have a much higher spectral efficiency with a narrowband technology solution than you do with a spread spectrum solution and that translates into higher network capacity. Very roughly – depending on different regulations and implementations – Weightless-P has 100x the capacity of LoRaWAN (that's based on a typical data packet size and a typical interval between transmissions)."

According to Woolhouse, Weightless-P "listens before it talks" and that enables it to schedule uplink traffic from end device to gateway. "If you can do that, you can guarantee that that piece of data will join the traffic stream in a way that avoids data collision," he says.

While a steady stream of LPWAN technologies has come to the market, Bailey reckons the greatest coverage and bandwidth is still cellular. He says that demand for mobility has made Wi-Fi part of the corporate network but adds that for IoT, Wi-Fi deployment costs can be "prohibitive". Nonetheless, as energy harvesting technology develops, he believes Wi-Fi may become the answer, especially if IoT is seen as part of the corporate landscape for IT projects.

But for Essence's Zauer, the existence of varying competing standards for local connectivity often blocks the ability to offer an effective end-to-end solution in the residential IoT sector. "There remains a plethora of competing standards that create a barrier for service providers to give their customers an effective and flexible smart home experience," he says. "It is important to maximise the benefits of each technology and utilise them where a particular network adds value. Relying on alliances and interest groups to create full interoperability can prevent the market from moving forward."

Rajant seems to have a simple solution to any confusion created by all the various IoT standards and protocols. "We are completely agnostic in terms of the kind of low-power end user devices that capture and disseminate information on a local scale," says Mason. "From a very basic technology standpoint, Rajant's approach has been to make sure that all of its devices act like a Layer 2 switch. Therefore it doesn't matter what standards are used – as long as there is an Ethernet presentation coming out of the device, we will transmit the data."

However, he does acknowledge that all the emerging standards and protocols do not make things easy for end users considering an IoT deployment. "When I look at organisations such as the Weightless SIG or LoRA Alliance, I see that both are relying upon the concept of open standards capturing the input of more than just their own developers, and emerging as a strong protocol as a result. I think there will probably be a winner, just in terms of the sheer number of networks deployed using one or two or another of these standards. But I also bet that if they are both strong runners, there will be somebody who solves the issue of getting them to work together."

Day is likely to welcome that when he says: "Because the range of use cases and applications is so vast, a single standard could actually inhibit innovation and growth. For example, cellular and Wi-Fi technologies are based on completely different standards, but this has done nothing to limit their development and usage."

Woolhouse adds to this by saying that a few years ago Sigfox seemed destined to be the winner for LPWAN technology and now LoRaWAN is in the ascendancy. "But today, people are generally fairly confident that NarrowBand-IoT is going to be a core technology that will prevail over the longer term. Weightless agrees with this, but we also feel that there is space for complementary, private network technology in unlicensed spectrum.

"The actual mobile network operator business model is that they have a much higher ARPU [average revenue per user] from people using their mobile phones to access YouTube videos than they do from a machine that might, once in a while, send a few bytes. So it makes sense to offload some of that traffic to a different network in the same way that 4G and Wi-Fi are complementary today. We therefore feel that Weightless and NB-IoT will be complementary."

Woolhouse says Weightless and NB-IoT have exactly the same benefits, and also points out that there is "no surprise" that Ubiik (the primary vendor of *Weightless-P* technology) and the 3GPP (3rd Generation Partnership Project) community have each chosen 12.5kHz as the channel width for their transmissions, as this offers optimum performance.

Furthermore, he emphasises that Weightless is a genuinely open standard: "The technology is available for developers to use on a FRAND [fair, reasonable, and non-discriminatory] and zero royalty free basis. That cannot be said for technologies like LoRa which use SEMTECH chipsets and chirp spread spectrum modulation schemes that are proprietary."

Fit and forget?

Once the IoT is up and running, what does the team responsible for it need to do when it comes to its routine operation? Security is of course always at the top of the agenda in all things IT, and perhaps even more so when it comes to the IoT.

From a connectivity management perspective, Bui says the network team should ensure that proper monitoring gates are put in place. These should have the ability to disconnect devices from the network and alert administrators if unauthorised communication is detected. She adds: "If the devices have access to open internet sites, whether http or https, look into solutions that can block them from accessing sites with known malware and/or create a whitelist of sites that the devices are able to access."

According to Mason, it is well-known that proactive security appropriate to the application is all about the packages and processes that are applied, and educating staff not to plug-in unknown USB devices, etc. But he says users in industrial environments are less accustomed to proactive security because availability is everything. "We frequently find all the networks with username 'admin' and password as 'password', and it has been that way for 20 years. And the reason it has been that way is because until recently, the network has not been connected to the internet."

He goes on to argue that an Internet of Things network doesn't actually always have to be connected to the internet. "It does not

need to use the internet as a backhaul. There are cost implications, but depending upon the criticality of the data, you might want to keep it all completely private and have no external entry point into your IoT network. Elimination of the internet as backhaul is one way of reducing risk."

Having said that, Mason admits that the reality is the more sensors and access points you introduce to a network, the more vulnerable you make it.

As well as security, Cisco identifies several other core challenges for network teams to be vigilant about. "Deployment of IoT on cellular networks is the equivalent of now having thousands, tens of thousands, or even hundreds of thousands of devices on your monthly phone bill," says Bui. "You need to be able to monitor for real-time data usage and adherence to the rate plans you have negotiated."

The teams should also have the ability to detect the abnormal behaviour Bui noted above: "You need to be able to immediately detect deviations from standard behaviour because they can be indicators of fraud, security misuse or worse. So let's say the normal behaviour of your device is that it works only in Australia, is connected to a network 24/7, and consumes about 8MB of data per month. If it suddenly starts consuming 30MB, it could be an indication that it's been forced into a botnet."

Another core requirement is being able to ensure that the device can connect to the network when needed to reliably exchange data, identify connectivity issues, and troubleshoot them in real-time. That means regular network performance monitoring has to be one of the top priorities – as Mason says, having the network delay your email by 30 seconds is one thing, but if a patient's

vital signs parameters are neglected for 30 seconds it could be terminal.

He goes on to describe an IoT deployment as just "another" wireless network implementation, albeit one that is complex and with different flavours. And in his view, every wireless network "without exception", suffers from 'drift'.

"It is deployed, commissioned, installed and works perfectly according to the requirements. But from day one, things begin to change. People change environments and they add applications. For instance in our experience, people who tell us they are only going to have two cameras on the network suddenly find it is poorly performing because they added six."

"IT is a combination of people, processes and technology, and it is seldom just the technology that is the problem. It is usually the people and the process surrounding that." ■

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Some of the latest uninterruptible power supplies to keep your systems up and running when your main power supply is down.

Protect Plus S500 is a new transformerless UPS from **AEG Power Solutions**. It is said to combine high efficiency values with a compact footprint and flexible configurations.

Reducing overall cost of ownership, AEG says this latest addition to its *PS* range is ideal for small and medium applications where low power consumption, ease of maintenance and space are important considerations.

The *S500* is a double conversion device (VFI SS 111). AEG claims it 'eco' mode allows secured operation up to 99 per cent, thus reducing the utility costs associated with operating a UPS of this type. Moreover, the company says it produces



less heat waste resulting in minimised air conditioning costs and with system AC/AC efficiency up to 95.5 per cent.

The UPS features removable internal modules for ease of maintenance, contributing to low MTTR, and parallel units can be hot connected/disconnected. AEG adds that the CAN bus-based distributed control systems ensure "optimum" load sharing and allow the system to be easily expanded up to six units, both in power parallel or N+ redundancy.

The *S500* completes the company's transformer-less UPS range which is designed to protect mission-critical applications from 400VA to 4MVA.

CENTIEL's CumulusPower is a three-phase UPS which offers continuous power availability, fault-tolerance, and 'Distributed Active Redundant Architecture' (DARA). The latter removes single points of failure, according to the manufacturer.

The unit from the Swiss vendor is exclusively available in the UK from MPower UPS. Unlike traditional multi-

module systems, it claims *CumulusPower* combines DARA with unique 'Intelligent Module Technology' to offer 99.9999999 per cent availability. The company explains that this is achieved through fully independent and self-isolating intelligent modules, with individual power units, intelligence (CPU and communication logic), static bypass, control display and

battery. In the "unlikely" event of a failure, modules can simply be swapped without transferring the load to raw mains, says MPower.

The UPS has been designed to reduce total cost of ownership through low losses with high double conversion efficiency of what the company says is 97 per cent at the module level. It adds that the small footprint contributes to achieving a high power density of 412kW/m² with an input THD of less than three per cent.



Furthermore, vertical and horizontal scalability means clients can pay as they grow as *CumulusPower* modules can be connected in parallel configurations to provide redundancy or to increase a system's total capacity.

MPower says serviceability is also straightforward with simple fault clearance and tool-less replaceable, hot-swappable modules.

the *C200-2000* which offers maximum power of 1400W.

Backup time (full load) is stated as six hours for recovery to 90 per cent. Other features include auto shutdown in the event of a mains failure, auto-restart, cold start, off-mode charging, USB connectivity, and RJ11 and RJ45 filters. There's also a 'smart' LCD that shows AC and battery modes, load and battery levels, input/output voltages, plus overload, fault and low battery indicators.



Power Control's CertaUPS range

features models available from 800VA to 20kVA, and includes the *C200* which is described as an "advanced UPS with a pure sine wave output".

With an AVR (automatic voltage regulator) as standard and wide input voltage window, it's claimed the device regulates a precise output voltage without switching to battery power, even if the input voltage fluctuates by as much as 30 per cent from normal.

Developed as a compromise between offline (VFD) and online double conversion (VFI) technology, Power Control says the *C200* utilises digital line interactive technology with a digitised PWM-based controller. It says this produces a pure sine wave output which makes it "perfect" for supporting critical equipment.

There are three models to choose from: the *C200-1000* which offers maximum power of 700W; the *C200-1500* which offers maximum power of 1050W; and

associated power/combo cabinets.

'Energy Saving' is also now implemented as selectable system operating mode for any *MULTI POWER* solution (power or combo cabinet with *PM25* or *PM42*).

According to the firm, its UPS provides the "highest" level of power protection keeping the system in 'ON-LINE' operation (inverter supplying the load) and granting the redundancy level set. Riello says in terms of load level, the control will automatically activate the required number of power modules to supply the load as appropriate, thereby ensuring the "highest level of efficiency".



Riello has added new features and options to its *MULTI POWER* UPSs in an effort to enhance its flexibility.

They can now be used with a 25kW power module (*PM25*) which comes with a dedicated power cabinet (the *PWC 130*). This is designed to accommodate up to five *PM25*s, and up to four complete power cabinets can be connected in parallel, increasing capacity and redundancy from 125kW up to 500kW.

Riello says key components as well as the display and communication ports remain the same as used for existing solutions based on *PM42* and

provide better power density than lead-acid equivalents, yielding savings in space and easier maintenance resulting in an improved MTTR.

Schneider claims that the technology deployed within the *Galaxy VX* not only provides a "highly resilient and efficient" power protection solution, but can also lead to energy savings of more than £407,000 over the 10 year life of a 1.5MW UPS.



Schneider Electric describes the *Galaxy VX* as a "highly efficient, easy to deploy, compact three-phase UPS" with flexible operating modes for large facilities, data centres and business-critical applications.

Intended for use in large data centres and colocation facilities, the *Galaxy VX* is rated at 1.5MW, 1.25MW, 1MW and 750kW, and can be paralleled to support multi-megawatt load power requirements.

The new UPS features 'ECONversion' mode. This is a hybrid version of Eco and Double Conversion modes, and is said to deliver double conversion performance with up to 99 per cent efficiency.

Furthermore, through "highly efficient" Double Conversion Mode, Schneider says the *Galaxy VX* reduces switching losses using a four-level conversion technology. It reckons the reduced switching stress offers greater reliability and reduction in failure rate.

The device also features Li-ion batteries. According to the firm, these

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UK IT jobs on the rise

IT vacancies have risen across the UK, with the number of jobs available in the second quarter of 2017 up four per cent compared to the same time last year, according to the latest Robert Walters jobs index.

The specialist professional recruitment consultancy says while economic and political uncertainty has led employers in certain sectors to take a more cautious approach to hiring (*also see 'Risk of post-Brexit tech brain drain', below*), technology professionals have enjoyed ongoing demand for their skills.

"The recent *Wannacry* cyber attack has once again highlighted the importance of robust cyber security systems, and specialists in this area are highly sought after by employers," says Ahsan Iqbal, associate director, Robert Walters. "In addition, ongoing digitalisation projects from employers across a range of industries are driving demand for developers."

Iqbal claims IT pros specialising in these high demand areas are in a strong position to command "large" salaries and "generous" benefits packages, with many receiving multiple job offers simultaneously.

He adds that demand for professionals is also being driven by urban centres such as London, Birmingham and Manchester developing into major hubs for tech firms.

"Employers looking to secure top calibre professionals need to move rapidly when recruiting, in addition to taking a progressive approach to work-life balance initiatives," advises Iqbal.

Risk of post-Brexit tech brain drain

The number of skilled tech workers from the EU relocating to the UK has declined since last year's Brexit vote, says new data from the Arrows Group. It also reveals that there has been a notable increase in top UK digital talent moving elsewhere.

Arrows Group specialises in providing talent and consultancy services, and says it has more than 2,000 developers, tech specialists and project managers on its books. Drawing data from that community, the company has looked at how last year's vote to leave the EU and the triggering of Article 50 in March has affected jobs in the UK tech sector.

It found that some overseas candidates are turning down competitive roles in the UK. Arrow Group founder and CEO James Parsons says: "Over the last year, we've seen a 10 per cent reduction of skilled workers from within the EU relocating to the UK. This trend is also being felt at a business level as some of our clients are apprehensive about increasing their investment in the UK, given current uncertainties."

According to Parsons, as many of Arrow's clients want to expand their tech teams quickly, they need to invest in a location that can give them a healthy supply of talent to meet their objectives, which they cannot guarantee here in the UK.

"If this trend continues, it could lead to a 'brain drain' of top UK talent, as generally they will want to work where the exciting projects are. We're already seeing an increase in best-in-class developers taking roles in places like Lisbon and Zurich which continue to be fast-growing hubs for tech innovation."

Parsons continues by pointing out that this is not good news given that the UK's digital skills gap is already large and

where a significant amount of tech talent comes from abroad.

"My advice to any UK business at this time of uncertainty is that they should consider expanding their global footprint and potentially broaden operations to where the talent is located, as well as be proactive in expanding their pipeline of homegrown UK digital talent."

IN BRIEF...

■ TÜV SÜD UK has been certified for the government's *Cyber Essentials* programme which is now mandatory for suppliers of government contracts. It will also enable organisations to prove they have taken the appropriate steps to comply with the GDPR. TÜV SÜD says organisations that use its certification will be able to say that their IT systems

comply with a government-endorsed standard, demonstrating that they are protecting their own and their customers' data by having a "robust and secure" IT environment. TÜV SÜD specialises in testing, auditing, and training services, and is part of Germany's TÜV SÜD Group.

■ Munters Data Centre Academy is offering a variety of education programmes including lunchtime seminars. The company says its experts will guide participants on topics such as air-cooled data centre design through to indirect evaporative cooling principles using heat exchanger technology. Based in Iceland, Munters is a global provider of energy efficient air treatment evaporative air cooling, temperature and humidity control solutions. When it comes to data centres, the company claims its evaporative technology currently cools more than 851MW of

rejected heat while achieving low partial PUE results, CO2 emissions and high energy savings. www.munters.com/datacenters

■ Abertay University, Dromont Crime Solutions and Police Scotland have developed what's described as a 'serious' video game that can be used to train police officers in how to deal with cyber crime. Using a mobile device or PC, trainees move around an interactive virtual apartment to find possible evidence and make decisions about applying legislation and police powers. The game has been used to teach more than 90 Police Scotland officers how to recognise and secure different networked and isolated digital devices, recording vital evidence that could be lost if the equipment is not handled properly. The developers say it can be easily and quickly updated to reflect changes in technology.

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Benefit longer term, by investing in testing your UPS system

by Mark Waters

It is misguided to assume that just because a UPS is running; it is fully operational, fit for purpose and legal. While a power failure may only occur for minutes, recovery can take weeks, if not months (and be expensive).

UPS testing is riddled with complexities and dangerous, but what is involved? A maintenance contract provides 24/7 emergency technical support, plus monthly, bi-annually and annual testing including:

- Preventative maintenance – test transfer switches, circuit breakers and maintenance bypasses, use thermal imaging to locate hot-spots and reveal poor connections and gauge if anything is unusual.
- Checking protection settings and calibration – proactively assess what is going on and determine if any element is at the end of their useful life.
- Functional load testing – ensures optimum operational efficiency incorporating.
- Steady-state load tests to check input/output conditions and harmonics at varying load percentages (typically 0%, 50% and 100%).
- Complete operational test including a monitored battery-rundown to verify system continuity in a failure situation and determine battery degradation.

Using a company, with significant experience in UPS maintenance, testing and monitoring, such as Critical Power is paramount. Having the ability to claim for component failure under warranty or maintenance contracts means the manufacturer faces the cost rather than the user. So, granted UPS testing is costly and time-consuming, but the costs associated with an unanticipated loss of business will, without doubt, outweigh those incurred from testing.

For more information on UPS In Life Management please call Callum White on 0800 978 8988 or request a free site survey to discuss how we can help you.

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