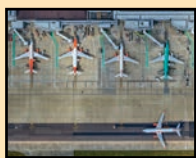


networking

FIXED & WIRELESS NETWORKS FOR ENTERPRISE USERS

DMR goes on air

Digital Mobile Radio replaces analogue comms system at Gatwick airport
News, p3



Built for purpose

Robust and flexible network solutions for the building trade
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Now you're talking

IP telephony and its place in the present and future of enterprise comms
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Seeing is believing

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NHS and its suppliers 'not ready' for N3 replacement next year

by Rahiel Nasir

Industry experts are warning that the NHS and its suppliers are not yet ready for the new Health and Social Care Network (HSCN) that is due to be introduced next year.

In 2014, the NHS established the HSCN programme to manage the exit from its existing N3 contract with BT which expires in March 2017.

Provided by multiple suppliers, the idea behind HSCN is to act like a single network, enabling health and social care service providers to deliver, share and consume services regardless of their location or network supplier.

As part of the programme, the NHS states that it is working closely with network suppliers to establish "appropriate and viable" interoperability standards. They are also developing a service certification

process which, according to the NHS, will not require "major investment" to adhere to and will "maximise supplier participation".

In addition, the programme will establish the central infrastructure and capabilities – such as integration and security monitoring – that will be required to manage the safe and reliable operation of the multiple-supplier network environment.

Innopsis is the industry association for suppliers that provide network services to public sector bodies. It worked with NHS Digital to create the obligations framework for HSCN. Innopsis director Michael Bowyer says this framework needs to reflect the capabilities and technological advances available today from all suppliers.



The NHS says HSCN will act like a single network for health and social care service providers.

"We did not want a like for like replacement of N3, which saw BT deliver one of the largest private networks to the NHS in the UK. As that contract draws to its natural end, HSCN now offers smaller players a viable route into the market and a share of that opportunity which will extend beyond core NHS and into the social care user community."

Bowyer believes the new network will create a competitive connectivity supplier market, opening up opportunities for local and regional suppliers as well as national carriers. But he adds that it is up to industry to give the necessary assurance to healthcare providers that HSCN is a positive step for NHS Digital. *(Continued on page 2)*

Offering right digital tools crucial for retaining talent, says Sungard

UK employees are quitting their jobs if digital expectations are not met, according to research from Sungard Availability Services.

In a study carried out earlier this year, the business continuity specialist found that having access to the latest digital tools is considered crucial by 76 per cent of UK workers, whilst a third admitted they would be embarrassed to work in an organisation without them. Around a fifth of UK employees revealed that they had actually left their jobs as they felt they did not have access to the latest digital tools to remain competitive within their industry.

However, while employees recognise the need for digital tools, Sungard says many are struggling to get the most out of them. Thirty one per cent believe new digital tools are making their jobs more stressful, and 23 per cent said they do not understand how to use them.

Just over a third complained they were not given enough or any training to get the most from the digital tools provided by their organisation, with nearly a quarter stating that the little training they do receive is not relevant or up to a good enough standard.

Commenting on the findings, Eddie Curzon, the CBI's regional valley director, says that while technology is important, it is only part of a wider story. "IT only does what it is told; its success depends entirely on the competency and acumen of those operating it. While employees understand the value of digital tools, it doesn't necessarily mean they already have the skills in place to use them effectively."

The results of the survey were based on 715 interviews with IT decision makers in various countries including 153 from the UK, and 1,400 interviews with general employees which included 300 from the UK. ■



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CityFibre gives Bracknell gigabit treatment and buys more MANs

Bracknell is the latest metro area to join the roster of CityFibre's UK-wide 'Gigabit Cities'. Businesses in the Berkshire town will be able to access ultra-fast internet services over the company's fibre network, as provided by its reseller BtL Communications. BtL will also use the incoming services to offer cloud and communication solutions.

In what has been a busy few weeks for CityFibre, the company has also acquired Redcentric's duct and fibre assets in

Cambridge, Portsmouth and Southampton that total more than 137km of cable.

CityFibre CEO Greg Mesch says the new networks are routed to address local areas of identified high demand for high-bandwidth services. "We've shown that under-utilised legacy fibre assets can find a new home in which to flourish within CityFibre's wholesale shared infrastructure model," he explains.

For example, Mesch says the 44km network across Cambridge reaches many

of the city's key science, business and research parks which are home to a range of the UK's most successful technology businesses. "Once made more broadly available, the networks will also benefit the wider local communities as they attract inward investment and stimulate economic development."

CityFibre now owns 40 MANs in the UK. Mesch reckons the growth makes the company an "increasingly powerful national competitor" to BT Openreach. ■

NSA inks cyber security deal with CREST

CREST will take over the operation of the US National Security Agency's (NSA) Cyber Incident Response Assistance (CIRA) accreditation programme.

UK-based CREST is a not-for-profit accreditation body representing the technical infosec industry. It has recently launched a US chapter with new offices in New York. Gotham Digital Science, MWR InfoSecurity, Nettitude, Stroz Friedberg and Trustwave have been announced as its first members.

The organisation's move into North America has been supported by the Foreign and Commonwealth Office as part of the Government's commitment to promoting the UK's professional cyber-security skills and experience abroad.

The relationship between CREST and the NSA's Information Assurance Directorate (IAD) aims to facilitate the growth of the CIRA programme, and ensure the continued integrity of the accreditation process which will remain unchanged. CREST adds that it will maintain secure communication through the National Security Cyber Assistance Programme portal for all organisations that go through the process of re-accreditation.

"The relationship with the NSA in the US will support the maturity of incident response services into other government and commercial departments outside of NSS," says CREST International director Rowland Johnson. "It is hoped that it will also encourage cyber security service providers to have their capabilities assessed and accredited." ■

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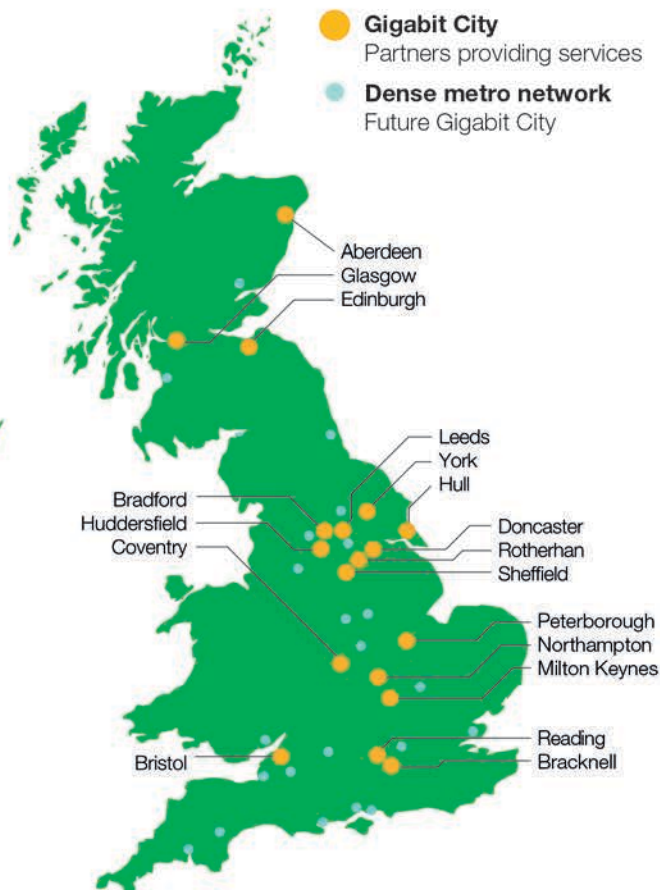
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CityFibre

NHS not ready for N3 replacement

(Continued from page 1)

Meanwhile, Updata is advising NHS organisations and network providers to mobilise now in order to be ready for next year. The company's MD Béatrice Butsana-Sita says: "The N3 contract will end in just six months, yet many NHS organisations are still to begin their search for a new provider, with many seemingly unaware of the choice that will soon become available."

Updata is part of Capita and provides managed networks and communications services to public and private sector clients. It reckons there are several key challenges that the industry needs to overcome in order to prepare for HSCN.

These include: ensuring all NHS organisations have access to a robust, reliable and secure network; communicating the changes that HSCN will bring; and ensuring service to patients is not impacted while the switch-over takes place.

Butsana-Sita says: "With the potential for a rush on suppliers as the deadline approaches, healthcare providers should start looking at the marketplace now to avoid getting trapped in delays caused by supplier demand."

While the N3 network contract ends in March, the NHS says there is an option to extend this to September 2017 if additional time is needed to support transition. In its online guidance, the organisation adds that it is also considering arrangements for handling N3 access connectivity contracts that go beyond this date. ■



Change is in the air: the airport's new communications system will support 1,300 staff.

London Gatwick has installed a Digital Mobile Radio (DMR) system that aims to double its previous voice and data communications capacity.

The *Capacity Max* digital radio system from Motorola Solutions is designed to be used by 1,300 staff, both airside and groundside. It replaces an existing analogue communications network.

Motorola says staff will also be able to utilise the incoming system's data capacity with new applications. These include *TRBOnet PLUS*, the vendor's dispatcher application that enables voice recording, mapping and event logging in the control room, as well as *iBeacon*, an indoor positioning feature which allows alerts to be sent to individual radios based on location.

Other built-in functionality includes settings for lone workers, geo-fencing to create restricted areas, and automated escalation protocols which, according to

Motorola, will bring upgraded safety and security capabilities to the airport.

The company adds that as the system hardware is connected via Wi-Fi, software updates can be transmitted via Gatwick's wireless network directly to equipment and endpoint devices, with less load on the core radio network.

"We have experienced significant growth over the past decade and we are now approaching the limits of our previous analogue system," says Simon Telling, IT project manager at Gatwick Airport Limited. "Migrating to scalable, digital communications will double our capacity, and bring new capabilities that will help us improve efficiency and safety for staff, retail partners, and passengers across the airport."

Gatwick is said to be one of the UK's most important transport hubs: 40.3 million passengers passed through its gates last year, a 5.7 per cent increase on 2014. ■

New-build Chase Farm Hospital data centre ready for switch-over

Royal Free London NHS Foundation Trust hospital Chase Farm has completed the development of a new 45m² external data centre that will form a key part of an advanced healthcare redevelopment project.

The new facility in Enfield, North London, will enable Royal Free London to support a five-storey acute hospital containing an urgent care centre, eight surgical theatres, and a day surgery unit. The completed redevelopment of the hospital will have its official opening in Summer 2018.

The data centre, designed and built by Secure IT Environments, has been specified to meet BS/EN1047 fire rated test standards, and is said to offer a high level of security to protect patient data and the hospital services.

The company says the new "energy efficient" facility has a PUE rating of 1.2, and that its mechanical and electrical infrastructure is in an N+1 format to help ensure operational continuity.

Secure IT Environments adds that a key challenge for the project was that the location of the data centre was on the route to the main hospital buildings, all of



An artist's rendering of Chase Farm Hospital's new data centre which aims to support advanced healthcare redevelopment projects.

which were being demolished as part of the major investment project. While main contractors needed the road constantly available for heavy demolition vehicles, security had to be maintained at the data centre site which was keeping the rest of the hospital's IT infrastructure operational throughout the project.

A new mains power supply from a substation was also needed for the data centre, something that had to be very carefully managed in partnership with the main site contractor given the data centre was in constant operational use. ■

NHS to trial IoT for patients – News p4.



THE WORLD ACCORDING TO...

Paul A. Reules, director product management, Masergy

An SD-WAN reality check

SD-WAN promises much: application reporting, zero-touch provisioning, centralised policy management and policy-based application routing.

But the technology is still evolving and there are some drawbacks.

For example, there are overhead issues associated with many of the capabilities that SD-WAN uses to make the internet more reliable. And while many believe SD-WAN is less expensive than private networking, in some cases it is in fact costly.

Furthermore, upload speeds may be constrained when using SD-WAN purely over broadband internet. Setup and maintenance of centralised policy management and zero touch provisioning can be complicated. Its also worth pointing out potential issues with lack of

interoperability standards that can cause vendor lock-in.

Of course, when implementing any new technology, there can be unanticipated execution risks and expenses that are inherently greater than with well-established solutions.

So what's the answer? Take a gamble that SD-WAN is right for you? Or wait until it's more mature but then miss the option that SD-WAN provides in making maximum use of the bandwidth you've already invested in?

My suggestion is to implement a fully managed SD-WAN solution to mitigate the risks and expenses associated with deploying any new technology on your own. Use the expertise of a proven service provider and avoid vendor lock-in.



The relaxation and recreation facilities at UKFast's current HQ will be retained at its new 40,000ft² site pictured here.

UKFast expands HQ space and hints at startup help offer

UKFast is doubling the size of its HQ with the acquisition of 40,000ft² of space adjacent to Manchester Science Park. The company has finalised the purchase of the neighbouring building, formerly occupied by Laing O'Rourke, as part of an expansion plan.

CEO Lawrence Jones says the company has outgrown its HQ "sooner than planned". He says the new building immediately gives UKFast a home for some of the other embryonic and non-core businesses it is developing."

Jones intimated that he is going to open up the building to other tech-centric businesses giving startups a chance to flourish in their early years: "The building is too big for us on day one, so we may as well give the surplus floor space to others who need it more than us. All will be revealed in time."

More than 300 employees are based

at UKFast's existing campus, with the new move opening up the opportunity to accommodate up to 800.

Jones also pointed out that the R&R facilities at the firm's current premises will be retained. "Our strategy to dedicate 30 per cent of our space to relaxation and recreation has been important to the working environment that we have created at UKFast. I plan to continue that when we expand next door."

The existing HQ houses a gym, steam room, bar and networking area, and an auditorium for up to 300 event attendees.

This latest expansion for UKFast follows an investment agreement announced earlier this year. The colo and cloud specialist has secured a £40m fund from the Royal Bank of Scotland to build on what it describes as double-digit growth. The financing enabled UKFast to acquire security specialist Pentest in June. ■

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Time for network revolution in Glasgow

Glasgow is on course for a 'tech boom' that could directly result in a £107.5m boost to its economy, according to telecoms provider Commsworld. The option for businesses in Scotland's largest city to connect through the company's services to CityFibre's forthcoming 'Gigabit City' network offers "unprecedented opportunities", claims Commsworld chief executive Ricky Nicol. He says: "The time has come for Glasgow's infrastructure to undergo its own revolution, preparing the city for future business growth and supplying public services with improved connections." ■

Druva teams-up with Fordway in G-cloud

US data protection solutions specialist Druva has announced a partnership with managed cloud provider and G-cloud supplier Fordway. The partnership will make Druva's public cloud-based data protection services available through G-Cloud for the first time. As UK government departments and other public sector bodies look to cut their costs around disaster recovery, the move to smarter procurement through public cloud services is becoming more attractive, according to Druva VP EMEA Rick Powles. Fordway joins Druva's *Elite PartnerSync* channel programme for managed service providers in the UK, which supports companies in selling unified backup, recovery and archiving services for enterprise endpoints and cloud applications based on public cloud infrastructure. ■

Volta and LuxConnect partnership

The UK's Volta Data Centres and Luxembourg's LuxConnect have allied in order to connect their communication hubs. They include Volta's facility near the City of London, and LuxConnect's multi-tier (II, III and IV) Uptime Institute-certified data centres in the Grand Duchy. The alliance aims at bolstering the security and continuity needed by enterprises in what the partners say is the "shifting" political and commercial landscapes created by a fast-growing IT services sector, and the potential re-structuring of the EU following the Brexit vote. ■

NHS trials use of IoT technology to help people living with dementia

A pioneering trial to discover how the Internet of Things could transform the lives of people with dementia has been launched by Surrey and Borders Partnership NHS Foundation Trust. The £5m project will involve 1,400 people, and is the first in the UK to test how the IoT could help to modernise NHS healthcare for people with long-term conditions.

Called 'Technology Integrated Health Management' (TIHM), the trial will help clinicians to remotely monitor the health and well-being of people with dementia so that they can intervene earlier to help someone avoid a crisis and unnecessary hospital stay.

Participating patients will have their homes equipped with non-invasive technological devices, such as apps and trackers. They include sensors attached to objects such as refrigerators, kettles and beds. These can detect if someone is following normal patterns of behaviour for eating and drinking, and whether they're unusually restless at night.

The devices will connect to each other via the IoT, and work together to collect and analyse different pieces of securely managed information about a person's health and behaviour patterns. The technology will not replace any existing face-to-face contact with

health or social care staff.

Surrey and Borders Partnership will lead the trial and has teamed up with nine technology providers: Docobo, eLucid mHealth, Halliday James, Safe Patient Systems, Arqiva, Vision360, Intelesant, Sensely and Yecco.

Its other partners include the Alzheimer's Society, University of Surrey, Royal Holloway University of London, Kent Surrey Sussex Academic Health Science Network, as well as six Surrey and north east Hampshire NHS clinical commissioning groups. ■

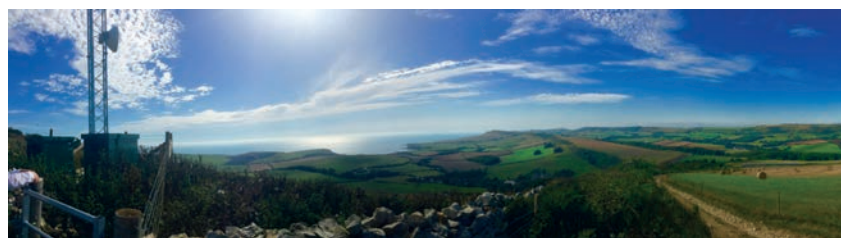
'Jurassic' village gets wireless connectivity boost

The remote Dorset village of Kimmeridge can now access wireless broadband via the *Airwave* branded service deployed by internet telephony provider VoIP Unlimited and its privately-owned IP network.

Located on the Isle of Purbeck, Kimmeridge has around 90 residents and its coastline forms part of the Jurassic Coast, a World Heritage Site.

VoIP Unlimited says its engineers laid fibre across rural Portland to a licensed microwave link which spanned the bay to a newly installed mast. By over-engineering the project and adding two antennas on the mast, the Poole-based company says the connection has dual resiliency.

With the land being protected, the company adds that it had to overcome legislative challenges during the deployment



VoIP Unlimited laid fibre to connect a licensed microwave link and a newly installed mast.

For instance, visual impact statements were mandatory, and an archaeologist was hired to oversee any excavation. Securing the new mast with concrete was also another hurdle, as the mixing process had to be done at the top of the hill due to its gradient and mixed in one go. VoIP Unlimited says its teams therefore needed to ensure absolute

accuracy as this could only be done once.

The village now benefits from 50-times faster connectivity, according to MD Mark Pillow. "To put that into perspective, the difference in internet speed means a customer using *Airwave* can now download a full TV episode in less than three minutes, rather than over 35 hours." ■

Metronet buys M247 to create 'disruptive platform'

Internet infrastructure and hosting company M247 has been acquired by Metronet (UK) for £47.5m.

Founded in 2000, M247 operates from Manchester and Bucharest in Romania, with clients that include On the Beach and Warburtons. Metronet says the acquisition is the first step in a targeted buy-and-build strategy that aims to create a 'disruptive platform' in the connectivity space with 'last mile' control. It reckons this will speed up communications to end-users.

"M247 is an excellent fit for Metronet because it provides the scale and reach to build upon our existing infrastructure," says Metronet chief executive Lee Perkins:

**Lee Perkins says
Metronet is now in a
stronger position to
offer a portfolio of
services across the UK
and Europe.**



"Following the acquisition of M247, Metronet will now be in a position to offer a combined portfolio of connectivity and content services across the UK and Europe, including wireless network services, data centres, and managed hosting solutions."

The combined Metronet-M247 business

will now have three data centres, more than 200 staff, and gross earnings reported in excess of £12m.

Backed by mid-market private equity firm Livingbridge, Metronet (UK) was formed in 2003. The Hulme-based company employs 150 people across its two sites in Manchester. Its full service offering includes internet connectivity, MPLS networks, alternative technology access circuits, and IP voice and security services.

Metronet (UK) says it works with more 2,500 businesses, such as Intu, Sofology, Total Fitness, Capital Properties, NetMonkeys, National Museums Liverpool, amongst others. ■



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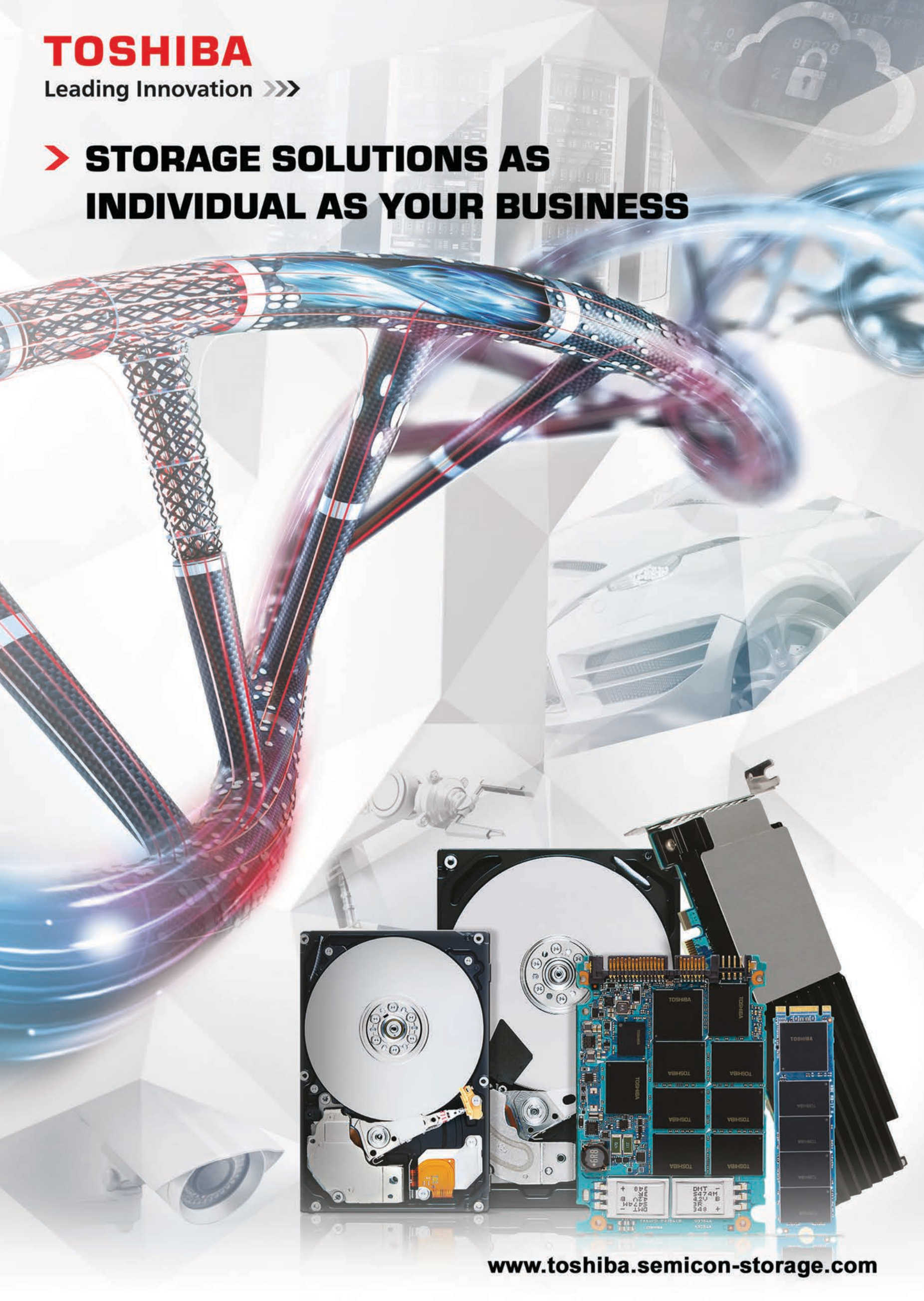
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Content hosting	55%	25%
Email	55%	33%
File sharing	51%	31%
Content creation	50%	25%
Active Directory	48%	24%

Most users allocate at least 64GB of memory to the hungriest apps to ensure virtualised applications run optimally.

Virtualisation risks maxing out servers

As virtualised workloads grow, memory and storage specialist Crucial has warned that it will only become more difficult for IT professionals to keep up with the demands placed on server infrastructure.

In a recent study of 350 IT decision makers in the UK, US, Germany and France, the company found that on average IT departments are running 29 virtual machines per physical server. When asked if a need arose to run more VMs per host, two-thirds said they would need to add more memory compared to 42 per cent who said they would need to add extra servers.

Forty seven per cent said unexpected issues like unpredictable workload demands or rapid user base growth is one of the biggest challenges they face when dealing with server workload constraints. A similar number said they are planning to upgrade

their server memory in the next 12 months as they grapple with the increasing demands of virtualisation workloads.

Crucial's worldwide product manager Michael Moreland says the research revealed that 58 per cent of IT professionals are running less than 60 per cent of their physical servers at their maximum memory limit.

He says: "Whilst 46 per cent of those IT pros said the memory installed was sufficient, others cited that a limited budget, limited time to upgrade, and limited skills to upgrade was preventing them from maxing out further servers, potentially hampering their efforts to keep up with demand."

Moreland believes server memory is a long-term investment that's never just about the "here and now" but about predicting future workloads. ■



VIEW FROM THE TOP

Richard Thomas, CEO, Highlight

Time to change your opinion of pesky cloud apps

While your IT team works diligently to manage the enterprise IT systems it has so carefully built, individuals within the business can easily bypass IT and sign up to cloud applications. Keeping track of exactly where your business-critical data lives then becomes extremely challenging.

Recent studies have found that seven out of ten UK workers use cloud technologies that are not supervised by their company (*Cloudstanding.co.uk, May 2016*) and nearly one in four organisations have no idea which "unofficial" apps are running on their IT infrastructure (*Cloud Security Alliance Jan 2015*).

Many users adhere to the principle that it's easier to ask for forgiveness than to obtain permission. Compared to waiting for the enterprise IT department to provide similar functionality, there's really no contest.

But the price is shadow IT whereby the IT department has no picture of which applications are being used to run the business, and they certainly can't manage, support or protect the IT infrastructure. Not knowing where sensitive data is held also leads to issues of compliance, data protection, privacy and security.

While you may think the lunatics have taken over the asylum, there are compelling and rational reasons for using unsanctioned applications to run a business. In fact, adopting a cloud app to rapidly answer a business critical need is often the competitive advantage enterprise needs. The reality is that the trend toward cloud apps is more or less irreversible because the benefits are too great.

The solution is for enterprises to make informed decisions on which apps are sanctioned and unsanctioned, so that risks can be sensibly assessed and weighted against business benefits. This requires solid information and a willingness to learn to live with this new reality.

Fortunately, network packets never lie. They tell the full and unalloyed story of which applications – internal or in the cloud – are in use and where that traffic is flowing around the business. Characterising application traffic like this is an important step in defining policies that allow a company to reap the benefits of cloud whilst minimising the risk and costs of unmanaged and unsanctioned app usage. Gaining insight is a pre-requisite to taking control.

New partnership sees IATA take flight in the Interoute cloud

The International Air Transport Association (IATA) has selected Interoute as its hosting and managed services provider.

IATA is a not-for-profit organisation, currently representing some 265 airlines worldwide. From its offices in 53 countries, the association works with its members to make air transport safer, more profitable and efficient through the implementation of global standards and solutions. As part of its remit to serve the air transport industry, IATA develops and operates many critical financial systems and applications.

Interoute will become the hosting and managed services provider for a critical set of IATA's industry settlement systems and services, as well as delivering DDoS protection and security consultancy. IATA's Europe operations will be hosted at Interoute's Virtual Data Centre (VDC) zones in Geneva and Zurich.

Two applications are already in the on-boarding process. They include the 'IATA Remittance and Settlement Integrated Solution' which processes the collection and settling of billing amounts due.

The other application is the 'IATA Clearing House' (ICH). This is said to provide fast, secure and cost-effective settling of accounts between the world's airlines, airline-associated companies, and travel partners. In 2015, IATA says ICH processed \$54.3bn in billing transactions, with a settlement success rate of "99.99999 per cent".

Pascal Buchner, CIO at IATA, says: "Interoute's infrastructure brings us the scale and reach vital for us to provide a best in class service to airlines."

According to Interoute, its VDC offers a global cloud of integrated network and compute resources across 17 zones in Europe, North America and Asia. ■

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Global expansion for Colt's managed SD-WAN platform

Colt Technology Services has expanded its managed SD-WAN service to 13 countries across Europe. It says the expansion will reach even more countries in 2017.

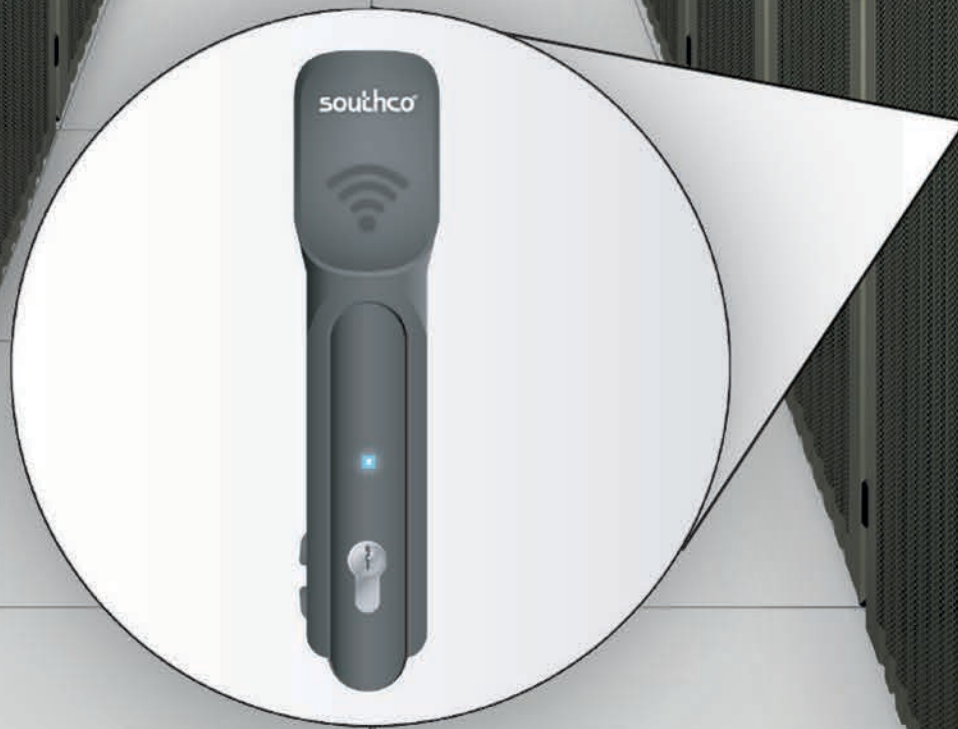
The hybrid service means enterprise customers will be able to combine dedicated data connections with low-cost broadband links in their WAN. Colt says this allows non-critical data to be offloaded to the public internet which is secured using IPSec tunnels. This then frees up MPLS bandwidth for critical data, efficiently increasing the total bandwidth to branch sites.

The firm's new offering is an NFV service with built-in on-demand elasticity and multi-tenancy. It combines SD-WAN software

with open, scalable, general purpose server hardware at the customer's premises.

Colt says it is leveraging the intelligent SD-WAN platform to enable its customers to dynamically route data traffic to manage both secure and internet routing in real time. This can be configured by Colt or the customer.

"The SD-WAN is a new way to architect, deploy and operate the WAN, providing a dramatically simplified way of deploying and managing multi-site connectivity," says Peter Coppens, Colt's director of network portfolio. "So much so that it's forecast that by the end of 2019, 30 per cent of enterprises will use SD-WAN products across sites, up from less than one per cent today." ■



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Home builder makes move to mobile

Crest Nicholson built nearly 3,000 homes in the south of England last year, and has 840 staff and about 2,400 contractors. Sales and marketing teams need to stay in touch with, typically, 45 sites in development, while engineers often need to download drawings and building specifications.

The company's group IT director, Myles Gibbins, says an increasing number of employees are using mobile devices: "We started rolling out mobile devices at executive level, and we're gradually deploying them to our customer service teams too. These users are the face of Crest Nicholson so we need to provide them with exceptional IT service levels."

The developer has a contract with Computacenter to provide IT services including a service desk that provides: incident, problem and change management;

IT procurement; server, storage and backup management; and network management.

"We pride ourselves on offering excellent customer care through the home-buying process," says Gibbins. "As sales take place predominantly onsite, we need to ensure we have adequate and well-maintained IT capabilities across our development sites as well as at our head and regional offices."

Crest Nicholson uses Computacenter's global service desk and operational command centre in South Africa. The firm decided to move services to Computacenter's facility in Cape Town due to the flexibility offered, as well as lower costs. Gibbins reckons this offers the best of both worlds. "We can take advantage of optimised processes that maximise efficiency thanks to Computacenter's industrialised approach to service delivery, but we also get the flexibility we need to meet changing business demands."

Every month at service review meetings, the combined Crest Nicholson and Computacenter team identifies potential improvements and creates a plan for putting them into action.

Gibbins says Computacenter's *PASS12T* methodology, which is based on a 'shift-left' approach, has resulted in a number of improvements over the years. "For example, we've [moved] system administration tasks for core applications

from the internal second-line support team to the Computacenter service desk, which frees-up our team for more specialist work."

Cloud-based email solves capacity issues for SDC



Construction company SDC is responsible for major projects across the UK, from replacing a 100 metre dome-shaped roof for Center Parcs (shown above), to constructing the £26m Maxwell Centre at the University of Cambridge. At any one time there can be 20 major projects on the go, with around half of the staff at the various sites who need to access resources and liaise with the company's head office in Bedford.

As SDC's IT infrastructure was five years old, IT manager Matt Clifford-Simmons wanted a complete refresh to ensure reliability for the next five years and improve support for those away from the office.

"This was my second big infrastructure refresh since joining SDC, and each time we need more capacity. Email, which is crucial for both customer and internal communications, was a particular concern. Users were continually emailing large documents to each other, which meant they were struggling to stay within their mailbox limits, and our backup was becoming larger and larger. If our onsite *Exchange* server fell over, it would have a major impact on the business."

SDC has a small IT team and has turned to EACS for support on major projects for several years. After researching potential solutions, Clifford-Simmons called the Huntingdon-based managed services provider to discuss his ideas. EACS agreed that *Microsoft Office 365* would be the best way to increase user efficiency and solve capacity issues, and advised him on best practice for the implementation.

The final project comprised *Microsoft Office 365*, with *Exchange Online* providing business-class email, *Skype for Business* for online meetings, *OneDrive for Business* for file storage, and *SharePoint Online* to support document sharing. Security was provided by a *Sophos UTM* firewall, supplemented by *Mimecast* for advanced email services such as protection, continuity and long-term archive.

EACS began by replacing the servers and moving SDC's virtual environment to a new SAN. It also installed switches to make full use of the capabilities of the high-speed connections between the servers and the SAN to enhance performance.

Next, the firm configured a hybrid *Exchange* environment with email flowing through both *Exchange* and *Office 365* via *Mimecast*. This meant a few employees could test the new system, before the remaining 300 were migrated onto *Exchange Online* and the old server decommissioned.

Fast and accurate data boosts materials sales

Travis Perkins is the UK's largest building materials supplier with 21 businesses, including Wickes and City Plumbing Supplies. It has more than 2,000 branches and 200 tool hire outlets, supplying more than 500,000 product lines.

The group's data director, David Todd, set out to find a solution to improve data across the company, which was distinctly siloed and not maintained or validated in any consistent way.

As the company focused more on online sales, data quality was key. But relying on employees and suppliers to enter product information resulted in incomplete and inconsistent details – and while it was supposed to be manually reviewed and approved, that did not always happen.

In an online arena, Travis Perkins could not continue to leave it up to staff to track down the correct information. The company also wanted to get more products on the websites faster, to drive more sales and to accurately demonstrate the breadth of its offerings.

Todd and his team considered a number of vendors and chose Talend, based on its flexibility and easy to use interface. He says: "It was well-priced and did what we wanted in the way we wanted it to. The open source nature fitted in well with the development strategy of the group."

Talend Data Services (TDS) was integrated with the company's product information management (PIM) tool based on *Hybris PCM*, to provide standardisation, validation and normalisation of data.

In essence, *TDS* provides a data quality firewall. So with any data that goes in, it first runs rules to check for duplicates, and confirms that checkdigits are valid for barcodes. The system also double checks descriptions – for example, anything less than 10 characters is flagged as not descriptive enough. "We have roughly half a million products so we need to be sure that the product the customers find on the system is the one they want," says Todd.

In addition, *TDS* standardises the data. For example, it automatically transforms it to a single unit of measurement instead of relying on users, and maintains a consistent master list of values.

Since implementing Talend's platform and getting all product descriptions consistent, Travis Perkins reports a 30 per cent increase of conversion of sales on the Wickes website. Thanks to more detailed product descriptions, Todd says the retailer now appears in the top five results in Google searches for many common industry terms.

Improvements in customer data entry will include real-time postcode lookups. According to Todd, the ultimate goal is to push the data entry far upstream as possible, with self-service entry for suppliers.



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Swyx Solutions believes IP will replace GSM as the transmission platform, and not just for voice but for video and data as well.

PHOTO: SWYX SOLUTIONS

You talk the talk...

...but if you haven't yet deployed IP telephony you're missing out on the future of enterprise communications. So is it time to walk the walk? JAMES HAYES finds out.

Laying voice traffic over enterprise data networks started out as a contentious proposition (in more ways than one). Its success relied on the savings that it delivered against standard time-tariffed telephone billing. But early IP telephony-adopting IT departments

came in for flak as end-users moaned about flaky audio quality when they were trying to sweet-talk a customer or conduct sensitive negotiations.

The introduction of more capacious network bandwidth both inside and outside of enterprise premises remediated

many of the early inhibitors to VoIP take-up, and the market now expects strong growth into the foreseeable future. That's despite decreases in landline voice traffic, and a disinclination for businesses to bite the bullet that consumers are now gnawing on: getting rid of the hardwired

phone altogether, and relying on mobile and *Skype*, *WhatsApp*, etc., for voice calls.

Most research indicates that the overall market for VoIP solutions has shown modest but consistent growth over the last two-to-three years. However, singling-out the growth characteristics of internally-



"We see less need for gateways to integrate our enterprise customers' legacy devices. Calls are increasingly VoIP end-to-end, not just in the carrier core network."

Mark Lewis,
EVP communications & connectivity,
Interoute

managed business VoIP can be fuddled by the fact that it often forms part of a unified communications (UC) system, or is also partially being operated as part of a secure hosted service.

Analyst IHS says that the global VoIP segment totalled \$73bn in 2015 – a five per cent increase over 2014. IHS had previously forecast that the enterprise VoIP market would grow to \$35bn in yearly revenues by 2018.

In its 2016 *VoIP and Unified Communication Services and Subscribers* report, the analyst states that the competitive landscape for business VoIP products and services has become "highly fragmented", with PBX and UC vendors, among others, expanding into the market. Additionally, hosted PBX and UC solutions and services are being sold alongside SIP trunking as multi-site organisations opt for hybrid infrastructures.

VoIP's strong suit remains cost-savings: why pay some 'greedy' telco for line rental and tariffed calls, when for some modest upfront investment, companies could run voice traffic over existing network assets, and channel it around with the rest of the IP data traffic? The cost-saving argument has surely proved persuasive on budget-setting boards ignorant of the knock-on issues VoIP is liable to suffer, and of the fact that, over the years, circuit-switched tariffs have come down.

Not just cheap talk

Despite its success, there are still some corporate quarters that have for one reason or another not warmed to VoIP, and still find objection to its audio quality, technical vulnerabilities, bandwidth encroachment and security flaws.

The VoIP market can assuredly be described as 'mature' if the number of enterprises still migrating from legacy phone systems to VoIP is anything to go by, says Mark Lewis EVP, communications and connectivity at Interoute: "We see less need for gateways to integrate our enterprise customers' legacy devices. Calls are increasingly VoIP end-to-end, not just in the carrier core network."

He adds that the reason enterprises 'stuck' with older equipment was their sunk investment which has now been completely depreciated. "This, together with the fact that VoIP can meet and sometimes exceed the performance of circuit-switched networks (IP network resilience, for example, is higher than circuit-switched due to automatic re-routing) means we do not see many enterprises wishing to keep their legacy equipment."

According to Claude Sassoulas, Europe MD at Tata Communications, what started principally with a drive to reduce phone bills has evolved into a more wholistic, advanced networked application that complements the latest UC and collaboration platforms. He says this features PSTN replacement, hosted, hybrid and cloud-based services, multimodal SIP, and integration with business SaaS applications. "In sectors that rely on contact centres, VoIP is now

the heartbeat of the business.

Some enterprises still remain on the fence, sticking to traditional fixed telephony because they do not want to invest in new applications that might soon become obsolete. The key is to opt for solutions that interoperate with legacy equipment while enabling the adoption of the newest VoIP technologies."

Nick Galea, CEO at 3CX, agrees VoIP is no longer just about making cheap phone calls and has become a key component in any UC solution. "The level of VoIP technological development maturity is high and is continual. Vendors are now tackling issues such as security by developing VoIP hacking-prevention tools, integrations with third-party applications such as CRM systems, and deployment on various devices."

More about security later.

But in the meantime, Daisy Group believes one of the greatest benefits of IP and VoIP is its ability to expand compared to the historic TDM backplanes of conventional PABXs. "Scalability at one site is easy," says the company's product manager Gareth Long. "But more importantly, the seamless performance across multi-site networks is a great advantage over traditional telephony solutions."

Bandwidth and monitoring

Regardless of assurances about the ease with which VoIP platforms can be integrated into existing networks, the process is not without its pitfalls for IT practitioners. As Lewis points out, a common challenge is to ensure that your network has the capacity to cope with the volume of VoIP calls. But he adds that because these use a predictable amount of bandwidth, the job of sizing a network is made much easier with the right monitoring tools.

Having said that, network managers still need to monitor VoIP performance on an ongoing basis, introducing yet another task to their workloads. Just because it might work satisfactorily following initial installation does not mean that performance levels will stay that way over time, as new applications crowd onto the IP infrastructure. VoIP's latency-dependence usually means that it is the first application to be adversely affected by overly-contended circuits.

"Some verticals, recruitment or manufacturing for instance, are embracing video as part of their communications mix," says Lewis. "When these end-users [switch] from



Network managers need to monitor VoIP on an ongoing basis. Interoute's My Services portal aims to give enterprise users visibility of their usage for services such as SIP trunks.

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voice to video, it can greatly affect bandwidth usage. This is where the network manager needs to monitor the usage of the network very closely, and perhaps consider rules about which end-users can use what capabilities in order to limit the risk of network saturation.”

When it comes to VoIP, tools that enable network managers to balance the necessities of contending applications could be better, reckons James Mitchell, senior product manager at Claranet. “There are a lot of tools out there that can monitor bandwidth and give network managers information about what it is being used for – which let them know how much is being taken up by email and internet browsing, and how much is being taken up by voice traffic. That’s the easy bit.

“But [VoIP systems] owned and operated by service providers do not

always provide a simple dashboard, and many network managers do not have good visibility of the core platform’s performance. Part of the problem is that there are lots of moving parts – calling clusters, failovers... It’s difficult to summarise all of that information into a meaningful dashboard, so there is a way to go here.

A little less conversation

Some industry pundits argue that the VoIP quality debate has proved something of a red herring. They believe many acute latency issues have been resolved thanks to higher bandwidth networks, and that users more accustomed to the vagaries of mobile phone audio quality have become more tolerant of landline quality fluctuations compared to a decade ago.

For instance, Mark Russell, director of operations for UK&I at Swyx, says VoIP audio quality is less a question of maturity than “acceptance” of the technology. “The quality issues that used to exist are now non-issues, because although you need to invest in better connectivity such as fibre to the cabinet, higher bandwidth is now much more affordable.”

While many end-users in today’s workplace are of a generation that has never known anything other than digitally-handled voice call quality, this is not to suggest that VoIP audio quality problems have gone away, or that it is not as important to users as it once was.

Back in the day, an enterprise voice network was the primary communications channel with customers, suppliers and associates, says John Baldwin, product manager of UC and VoIP services at Colt.

Since then, investments have been made to eliminate voice interaction. For example, in airline booking systems, even complex multipart sales can be managed without call centre assistance. Thus, so much transactional interaction has now been automated that call volumes can be reduced.

But as Baldwin points out, the remaining voice traffic has become ever more essential for a smaller but more important selection of key tasks and situations. “The voice call may not now be the support norm but has become, by definition, ‘special’. And with that focused reduction comes an increased concern for the quality and efficiency of voice communications, and the critical reliability of the service.”

The burden of scale

For Tata, a major challenge that network managers in international organisations face is how to effectively scale IP telephony services globally to all of their offices.

“In practice, many network managers are forced to work with multiple vendors in each country to keep their telephony working,” says Sassoulas. “What makes matters more challenging is that not all local vendors are able to provide the same security and reliability standards across all offices. This puts a burden on network managers day-to-day, who have to add new numbers, take care of upgrades, negotiate pricing and, crucially, provide a consistent end-user experience for all employees regardless of location.”

Greg Zweig, director of solutions marketing at GENBAND, agrees: “In many cases, CIOs are not anxious to manage the VoIP deployment process [considering the] time and staff resources it takes to discover and manage expectations across hundreds of sites and thousands of employees.”

Zweig goes on to say that while cloud-based VoIP may offer strong appeal to SMEs, larger enterprises face a number of challenging issues due to the scope and scale of their deployments. Along with the pitfalls of scaling common user experience across multiple locations mentioned above, he identifies two other primary inhibitors that MLEs encounter when replacing traditional telephony with a cloud-based solution.

Firstly, they are likely to have thousands of handsets: “If they are TDM-based, they are connected to a separate cable plant. The simple math of replacing these devices can be cost prohibitive. The trend towards



“In practice, many network managers are forced to work with multiple vendors in each country to keep their telephony working.”

*Claude Sassoulas,
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using more softphone clients (desktop and mobile) can help mitigate this expense but not eliminate it."

Secondly, Zweig says large organisations often have multiple WAN links and/or broadband connections at different sites. "In many cases these were engineered for traditional data traffic, and may not have sufficient bandwidth or QoS to sustain VoIP traffic that is driven from the cloud. Modern ICT infrastructure manages VoIP well but many organisations have generations of infrastructure deployed that is far from modern."

According to 3CX, perhaps the most glaring inhibitor from a network management perspective is VoIP's reliance on electrical power and on the internet. Galea says: "If your premises suffers a power cut or the broadband connection is interrupted, your VoIP system will not work. This could be catastrophic for business. That is why a network evaluation is necessary to determine whether a current setup can deal with the demands of an IP-based phone system, as well as whether service providers are reliable."

Of course, extra redundancy can be added in the form of additional UPSs and even satellite broadband backup. But these options are arguably really only viable for enterprises with deeper pockets.

"In terms of pitfalls, there must be recognition among network managers that voice is real-time and therefore should have priority over other applications," says Daisy Group's Long. "It is generally best that the network is managed and supported by a single company: this will minimise any inappropriate conflicts of interest. As regards the wide area connectivity, voice should be on a private connection to your network break out. Don't try and run voice over the open internet. It may work. But then again it may not."

He adds that another consistent VoIP niggle is the use of the SIP application layer gateway on routers. "SIP ALG should be disabled on the router if you are wanting to run voice services across the connection. Irritatingly, some routers default to SIP ALG if they are re-booted, so beware."

"Game over" for VoIP

Security still continues to be a major issue for VoIP – but then again, as Long points out, security remains a big issue for all forms of data networking. "Securing VoIP platforms with session border controllers is essential, and all other forms of network protection from cyber attacks should be considered. But no more so than any other aspect of the data network."

Insecure VoIP systems offer a great opportunity for data breaches, warns Dr. Jules Pagna Disso, head of research and innovation at Nettle. He says VoIP systems, just like IP CCTV cameras, tend to be forgotten when companies look at their security strategy. Furthermore, he reckons VoIP vulnerabilities are still not well understood even among general IT security professionals, so it is therefore not surprising that IP telephony remains largely insecure.

"When VoIP systems are used as standalone systems – i.e., not as a unified system in conjunction with other systems – they are open to attack," says Disso. "All that is needed for the attacker to control a phone line is its extension number and its password – which in most companies is generally set to four characters, and often the same as the extension number. In most cases when an attacker has a foothold inside the network, it's game over for VoIP systems."

And apart from cyber attacks, there is another problem: fraud. Citing stats from the Communications Fraud Control Association, Matt Hurst, technical director at Sonus says it is estimated that fraud alone cost the industry \$38.1bn in 2015, proving that voice communications systems remain a lucrative target for hackers and thieves. "Yet the feature functionality and cost savings provided by SIP [remain] big enough drivers to propel enterprises to migrate to VoIP."

And so it will not be, to use Disso's words, "game over" for VoIP. Furthermore, an increase in mobile and location-independent communications will also not have any impact on the future purchase levels of VoIP, according to Swyx's Russell. He believes IP will replace GSM as the transmission platform, and not just for voice but for



"There must be recognition among network managers that voice is real-time and therefore should have priority over other applications."

Gareth Long,
Product manager,
Daisy Group

"At the moment, we're at the halfway stage where we're using dedicated SIP trunks and links. But down the line, with increased bandwidth, we'll be looking at a giant peer-to-peer network where everyone can talk with any other individual or company, with a high quality of service, and without the need for carriers or billing for voice minutes." ■

video and data as well. All fixed or mobile communications devices will therefore become an integral part of the wider office network.

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off-the-shelf: audio and conferencing

Communication skills

Modern business communications is all about being seen as well as heard, and also has to be capable of other unified services.

Gigaset pro says its new *Unified Communication Suite* is a complete software package that enables users to integrate voice and messaging into a “powerful” business communication platform.

According to Gigaset pro, businesses increasingly need to integrate critical applications with their communication requirements. But it says that due to high costs and task complexity, many of these computer telephony integration systems are only available to larger organisations. Thanks to *UC Suite*’s per device licensing model, the company reckons this is no longer the case as organisations only pay for what they need and can grow as required.

It’s claimed *UC Suite* allows organisations to pick the flexible solution that meets the unique needs of their end users. Gigaset pro says its simple menu-driven interface allows users to connect its telephone systems and all IP-enabled devices into a single communication platform.

The software features a number of options such as quick communication by

integrating IM and email with presence so that users know who’s available and how to reach them with a single click.

Users can also pull up customer records based on caller details as well as simple one-click dialling. Other features include ‘click to dial’ from a computer and ‘contact pop-ups’ on incoming calls.

The company says use of the TAPI standard allows organisations to integrate their telephony with enterprise and small business applications from Microsoft, Sage, Salesforce, Oracle, amongst many others.

As well as Gigaset pro devices such as the *T440/T640* range (pictured), *UC Suite* runs on *Windows* and offers “deep support” for Microsoft applications such as *Office* and *Exchange*.



iQela, the mobile operator exclusively for enterprise users, has launched a service that gives SMBs a complete mobile-first, cloud-based unified communications solution.

The company says *Mobile Office* offers single number calling for businesses, “rich” UC capabilities, customisable auto-attendant, and intelligent call routing

based on employee availability. Because it has been built from the ground up specifically for mobiles, iQela says its service even works on 2G networks.

As part of the launch, the firm will operate as an MVNO across 3’s UK network. It says voice and data services are on a single month contract basis with customers able to select a single number that can be “seamlessly” redirected between devices, based entirely on rules set by the user.

iQela’s *Mobile Office* and call recording solutions will be available either via direct sales or through a community of value added resellers and solution providers.

New Star Networks has been announced as the first value added partner. It says that it plans to target small business users, particularly those with between one to 10 users who have not previously been able to access such services.



Lifesize claims to have come up with a “breakthrough solution” to address the problem of extending video collaboration to huddle rooms everywhere. The company reckons its new *Icon 450 HD* camera and phone system, paired with the *Lifesize* cloud-based video communication platform, “creates the easiest yet most powerful” experience for these essential meeting spaces.

According to the firm, huddle rooms are becoming ubiquitous in today’s office environments, but their dimensions often make it difficult for video conferencing cameras to put everyone in the picture.

The *Icon 450* features a smart-framing sensor which is designed to intelligently adjust its camera lens to automatically capture and include everyone in the view. Manual camera controls are also available to allow users to customise the



position when appropriate. Lifesize says the camera’s sharp, wide-angle lens offers an 82° horizontal field of view and a 59° vertical field of view.

When the *Icon 450* is combined with *Lifesize Cloud*, users don’t have to be in the office to connect to the meeting room. The service is accessible from anywhere and on any device for one-on-one or group calls, instant and scheduled meetings, and more.

The cloud-based conferencing application has also recently been updated. Among new features, it now includes calendar integration. With an on-screen view of meeting calendars and one click to join, the firm says customers using the *Microsoft Office 365* or *Google Apps for Work* calendar service can walk into a conference room, view their scheduled meetings, and join with one click to get a meeting started right away.

Swyx has developed an optional new tool that aims to make audio conferencing on its devices easier to organise.

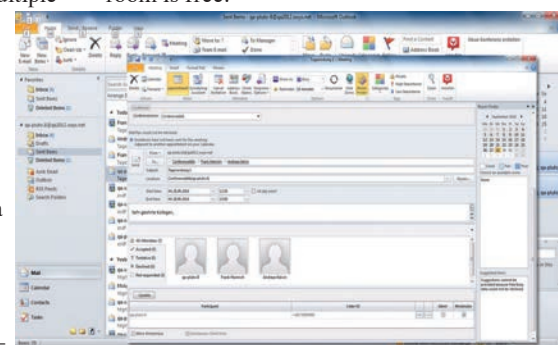
When it’s launched as an add-on module for its UC solution over the coming months, the firm says the *SwyxPLUS Conference Manager* will provide a “convenient” management function for organising teleconferences including scheduling meetings for large numbers of participants across multiple virtual conference rooms.

The management of invitations is done directly within *Microsoft Outlook*: each authorised user can easily organise their calendar and manage all parties, and the sending of meeting requests to contacts is done automatically via email. Participants can therefore be easily selected from existing address books.

In addition to being able to accept or reject invitations, a user-

specific access code is also included for conference calls. This ensures that only authorised persons can participate in confidential discussions.

Swyx adds that resource planning is taken care of automatically by the *Conference Manager*. The availability of rooms is therefore resolved quickly and easily, as organisers are automatically alerted when the appropriate conference room is free.



Yealink has released a mobile app designed to facilitate high-quality video-conferencing on smartphones and tablets.

Available for *Android* and *iOS* devices, the company says *Yealink VC Mobile* is an integrated part of its “one-stop” video conferencing solutions. It claims the app offers a reliable business video software solution for on-the-go staff with tablets or smartphones who want to easily join high-quality video-conferencing meetings anytime, anywhere.

Yealink adds that mobile users can leverage *VC Mobile* to connect via the internet with its video-conferencing endpoints such as *VC Series* room systems, *T49G* video phones (pictured), as well as other mainstream standard-based video-conferencing equipment and solutions.

The free app offers 720p HD streaming video and 1080p full-HD content

sharing. Featuring what’s said to be broad interoperability thanks to H.323/SIP dual-protocol support, it also includes Yealink’s *Intelligent Firewall Traversal* technology for risk-free video conferencing.

According to the vendor, this offers “superior” bandwidth adaptability and up to eight per cent packet loss resistance help to ensure a smooth video conference.



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Cyber security skills shortage set to worsen?

Governments and the private sector haven't brought enough urgency to solving the cyber security talent shortage, according to Intel Security.

For its *Hacking the Skills Shortage* report compiled in partnership with the Centre for Strategic and International Studies published earlier this year, the company surveyed 775 IT decision-makers involved in cyber security within their organisations across the US, UK, France, Germany, Australia, Japan, Mexico and Israel.

Eighty-two per cent admitted to a shortage of cyber security skills while 71 per cent confirmed their organisations have lost proprietary data as a result of this skills gap. Despite this, the study found that there are no signs of the shortage abating in the near-term – those surveyed estimated that an average of 15 per cent of cyber security positions in their company will go unfilled by 2020.

Intel Security Group SVP and GM Chris Young says: "To address this workforce crisis, we need to foster new education models, accelerate the availability of training opportunities, and we need to deliver deeper automation so that talent is put to its best use on the frontline. Finally, we absolutely must diversify our ranks."

According to the report, only 23 per cent believe that education programmes are preparing students to enter the industry. It said non-traditional methods of practical learning, such as hands-on training, gaming and technology exercises, and hackathons, may be a more effective way to acquire and grow cyber security skills.

While salary is unsurprisingly the top motivating factor in recruitment, the study found other incentives important in recruiting and retaining top talent include training, growth opportunities and reputation of the employer's IT department. Almost half of respondents cited lack of training or qualification sponsorship as common reasons for talent departure.

Intel says the shortage has become a prominent political issue as heads of state in the US, UK, Israel and Australia have called for increased support for the cyber security workforce in the last year. But it adds that while the security industry has talked at length about how to address the storm of hacks and breaches, more than three-quarters of its survey interviewees believe their governments are not investing enough in building cyber security talent.



"We absolutely must diversify our ranks," says Intel Security Group SVP Chris Young.

XPATJobs launches new IT careers website

XPATJobs has launched a new online IT-specific jobs board. The firm, which claims to run the UK's biggest careers website for international jobseekers, describes findajobinit.com as a "one-stop shop" that links skilled professionals in the technology sector with IT organisations across the world.

The new portal allows users to search for jobs as well as place new vacancies. It is said to provide employers and hiring managers with access to a network of more than a million registered jobseekers across 150 countries.

"With skilled talent in short supply, employers continue to look beyond national boundaries to secure the talent they need," says XPATJobs MD Rhys Maddocks. "But with an ever-growing number of online sources available, the actual sourcing of that talent is increasingly becoming a logistical nightmare for many hiring managers."

Maddocks claims his firm has spent "considerable" time developing a solution that is both highly targeted and has a global reach. "This significantly reduces the employer's time-to-hire as they can quickly find the right person for the right role."

NEW COURSES

Red Hat OpenStack Administration I – QA
This four-day course is designed for Linux administrators planning to implement a cloud computing environment using Red Hat's *OpenStack Platform*. It will teach students to install a proof-of-concept platform, and how to configure, use and maintain it.

The programme is based on *OpenStack Platform 8*, and covers the core services: identity (*Keystone*), block storage (*Cinder*), image (*Glance*), networking (*Neutron*), compute and controller (*Nova*), and dashboard (*Horizon*).

Red Hat Certified System Administrator (RHCSA) in Red Hat Enterprise Linux
certification or equivalent experience is a prerequisite for delegates.

QA currently has three courses available across two sites. www.qa.com

Amazon Web Services Technical Essentials – Global Knowledge

This course introduces AWS products, services, and common solutions with immersive exercises and hands-on activities. It is designed to help learners who do not come from a technical background to gain proficiency in AWS, and aims to empower them to make informed decisions about IT solutions based on business requirements.

By the end of the course, delegates will be able to: describe key AWS compute and storage products and services, identify the related *Application* services and *CloudFormation* templates, demonstrate how to launch and manage server instances in the AWS cloud, and more.

Places are still available at Global Knowledge's London training centre on 14 November. www.globalknowledge.co.uk

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