OCTOBER 2023
networkingplus.co.uk

NETWORKING+

Quantum-proof security

The timeline for quantum cyber threat is unclear

Duncan Jones, Quantinuum, p6

AI's impact on UC&C

IoT is playing a huge role on communication and connection

Michael Tomkins, IR, p14

Questions and answers

I'd cherish the opportunity of talking to Tim Berners-Lee

John Diamond, Park Place Technologies, p16

Deepfakes 'talk of the town' in Cybersecurity Awareness Month

October 2023 marks the world's 20th annual Cybersecurity Awareness Month, a globally recognised event with growing importance to the IT sector.

Businesses are adopting new technologies at lightspeed, however, the ability to secure the network against newly introduced vulnerabilities are struggling to keep pace.

According to the Department of Science, Innovation and Technology, 50% of UK businesses have a basic cybersecurity skills gap, and 33% have an advanced cybersecurity skills gap in 2023, with little improvement from 2022 or 2021. There is an estimated shortfall of 11,200 people to meet the demand of the cyber workforce.

"It is a time to underscore the importance of cybersecurity and engage with the broader organisation and the public on an important topic," says Aaron Kiemele, CISO at Jamf. "Cybersecurity Awareness Month offers a platform for, collaboration and positive public relations, emphasising the critical role of cybersecurity in today's complex digital landscape."

"Cybersecurity Awareness Month also reminds us of the increasing threat of deepfakes," adds Eduardo Azanza, CEO at Veridas. "Deepfakes occur when our digital identities are manipulated and misused, and they pose a significant risk to online security and trust."

Indeed, AI-generated threats are the 'talk of the cybersecurity town' this year and the most pressing issue for Paul Inglis, SVP, EMEA at ForgeRock: "AI is being increasingly weaponised against businesses and consumers to conduct ultra realistic and highly targeted phishing campaigns. It's increasingly difficult to spot what's real from what's fake. While we've seen some politicians and celebrities mimicked to cause reputational damage, many other deepfakes are being circulated to steal money or credentials. And all a hacker needs is an Instagram story or a TikTok video to create an audio and video likeness in a matter of seconds."

After the 2023 Slovakian election - believed to have been swung by deepfake influence - and a recent cyberattack that compromised the UK's Electoral Register, the dangers of deepfakes to our democracy is becoming significant. So significant, in fact, that the head of MI5 warned this month that deepfake AI could be deployed by Britain's enemies to influence the coming general election, casting doubt on the integrity of our democratic process.

Matthew Moynahan, CEO of OneSpan, believes that safeguarding political process requires a fundamental shift in how we verify ourselves online – from individuals to governments to businesses.

"Disinformation has always been a problem, but the democratisation and availability of AI has made it an even harder one to solve," says Moynahan. "Deepfake technology brings a whole new threat landscape for businesses, politicians, and everyday people alike, because it forces us to question the legitimacy of things we thought were once unquestionable. When your voice and image can be replicated to near 100% accuracy, how can you ever be certain that the person you're dealing with is who they say they are?"

"Fraud continues to rise to new levels, enhanced over the last year by the impact of generative AI," agrees Simon Horswell, fraud specialist at Onfido. "Fraudsters are using it to craft scams such as fake IDs, voice cloning, and deepfakes, and as bad actors adopt the latest technology for offensive means, identity verification companies have put in place many defences and are continuously monitoring and mitigating new fraud vectors."

In the present fast moving threat landscape, enterprises must ensure security teams are up to date with the latest threats. Training is key to helping employees develop the skills needed to defend the business. Moreover, with organisations increasingly threatened by nation-state actors, Cybersecurity Awareness Month serves as a timely reminder to remain vigilant. ■

IN DEPTH: Data centre design p8

7 million smart meters to lose connectivity in switch-off

According to the Public Accounts Committee (PAC), some 7 million smart meters are at risk of losing connectivity when 2G and 3G mobile communications networks are switched off by 2033.

The UK's national smart meter network is managed by the Data Communications Company (DCC). Existing Smart Meters (SMETS 1 and SMETS 2) use a mix of wireless network technologies to communicate how much gas and electricity people are using back to the central Smart Metering Wide Area Network (SMWAN).

"Too many smart meters are not fully functioning and millions more will be impacted when the 2G and 3G mobile communication networks close. In March 2023, around 3 million (9%) of smart meters were not working properly in total. Of these, 1.6 million are 'transitory' issues according to the Department, but the remainder were faulty, and either not sending energy use information to suppliers or not displaying usage to consumers, or both.

Suppliers are supposed to take 'all reasonable steps' to replace smart meters that are not working properly, but the government's rollout targets mean suppliers have much clearer incentives to prioritise the installation of new meters rather than replacing broken ones. Consumers are only guaranteed for a year the benefits arising from being able to monitor their energy consumption in real-time – because if their display breaks after that, the supplier currently has no obligation to replace it.

An estimated 7 million communications hubs (part of the electricity smart meters) will also need to be replaced, because they will lose functionality when the 2G and 3G mobile communications networks are closed. The costs of these upgrades could be very significant, and, like other costs of the rollout, are ultimately passed on to billpayers," said the PAC statement on the upcoming 2G/3G Switch-Off. ■

AI to transform enterprise

MIT Technology Review Insights' 'Laying the foundation for data- and AI-driven growth' report, produced with Databricks, has explored opportunities for businesses to leverage data and generative AI to deliver growth.

The report found that executives expect AI adoption to be transformative in the short term. 81% of survey respondents expect AI to boost efficiency in their industry by at least 25% in the next two years. One-third say the gain will be at least 50%.

CIOs are doubling down on their investments in data and AI; technology leaders need their data and AI assets to deliver more growth to the business than ever before. Every organisation surveyed will boost spending on modernising data infrastructure and adopting AI during the next year, and for 46%, the budget increase will exceed 25%.

Democratisation of AI raises the stakes for governance. Executives seek governance frameworks that can provide data accuracy and integrity as well as data privacy and security. 60% of respondents say a single governance model for data and AI is 'very important.'

As generative AI spreads, flexible approaches are favoured. 88% of surveyed organisations are using generative AI, with 26% investing in and adopting it, and another 62% experimenting with it. 58% are taking a hybrid approach to developing these capabilities, using vendors' large language models (LLMs) for some use cases, and building their own models when IP ownership, privacy, security, and accuracy requirements are tighter.

Talent and skills gaps overshadow organisations' other data and AI challenges. When asked how their company's data strategy needs to improve, 39% identified investing in talent and upskilling the workforce. 72% say it will be 'very important' to encourage innovation that will help attract and retain talent.

While upskilling is a primary concern for EMEA executives, job displacement is not. Only 14% of EMEA CIOs listed job displacement as one of their top two concerns; instead, they view privacy and security (52%), compliance (40%), transparency and accountability (34%) as top concerns.

Lakehouse has become the data architecture of choice. Nearly 75% of enterprises have adopted a lakehouse architecture, and almost all the rest expect to do so in the next three years. Survey respondents need their data architecture to support streaming data workloads for real-time analytics (a capability deemed 'very important' by 72%), easy integration of emerging technologies (66%), and sharing of live data across platforms (64%).

"With data and AI at the forefront of innovation, our report underscores the commitment of C-suite executives to steer toward a transformative future," said Laurel Ruma, global director of custom content for MIT Technology Review. "Strategic investments, consolidation efforts, and dedication to governance and democratisation of AI are not merely choices; they are imperatives for success."

''These findings indicate that investments in generative AI are no longer optional for business success - and leaders across the globe have firmly taken notice,'' said Samuel Bonamigo, SVP and GM EMEA at Databricks. ■

Flexible power procurement key

The Uptime Institute's 'Global Data Center Survey Results 2023' revealed that 55% of operators have experienced outages in the past three years.

Given the need to safeguard facility uptime rates, Aggreko is emphasising the role decentralised energy solutions can play for operators looking to reduce reliance on under-strain national power grids.

"The latest global survey from the Uptime Institute does give reasons to be optimistic, as outage rates are declining," said Billy Durie, global sector head – data centres at Aggreko. "However, 55% is still a very high figure for a sector where unplanned downtime is something that must be avoided at all costs. Yet, these figures are not surprising – factors outside the sector's control, including extreme weather conditions, supply chain degradation, strained national grid infrastructure and volatile energy pricing are threatening server halls more than ever before. If facilities are to maintain an uptime rate of 99.999%, new strategies will be needed." ■

JET Connectivity connects offshore wind farm with 5G

JET Connectivity has launched its largest, permanently deployable, 5G ocean data platform, built to provide 5G to an offshore wind farm.

The 17m tall, bespoke platform enables long range 5G connectivity for an offshore wind farm-based testbed which will reportedly be used to push the boundaries of digital operations through robotics and autonomy.

Offshore wind farms go through years of surveying, decision making, construction and commissioning before becoming operational. For a large proportion of this time, mobile phone signal and internet are not available due to the requirement of a stable platform and fibre cables traditionally needed to run a network.

JET Connectivity has developed a unique solution which utilises its own, in-house designed and built 5G Radio Access Network software and systems, and floating buoy hosting platforms, to provide pop-up, solar powered 5G networks to offshore sites. This delivers connectivity to those working offshore from the start of a project through to operation – enabling critical communications for staff working offshore, as well as high bandwidth autonomy and robotics for safer and smarter operations.

For this deployment, JET is working with a consortium including Microsoft and the Offshore Renewable Energy (ORE) Catapult, funded by industry, the Greater Lincolnshire LEP and Innovate UK, to deliver a 5G testbed – at an operational windfarm – which can be utilised by companies developing and trialling offshore technology that will require resilient, high bandwidth connectivity, such as drones and autonomous vessels.

"This launch of our first offshore network is testament to what hard work from an exceptional team can deliver, and I am so grateful of the effort and hours the team has put in, particularly in the final build the last few weeks," said James Thomas, CEO and founder of JET Connectivity. "I hope we can continue to make the maritime sector safer and more environmentally sustainable as we grow our deployments in the coming years. Features such as the reef cubes built into our mooring systems are small ways we can make a positive impact on our oceans above the core services we are offering and enabling with our ocean data hubs." ■

EDITORIAL:
Editor: Amy Saunders
amys@kadiumpublishing.com
Designer: Ian Curtis
Sub-editor: Gerry Moynihan
Contributors: Gordan Johnson, Stephen Amstutz, Duncan Jones, Alan Hayward, Anton Le Saux, Michael Tomkins, John Michael, John Diamond

ADVERTISING & PRODUCTION:
Sales: Kathy Moynihan
kathym@kadiumpublishing.com
Production: Karen Bailey
karenb@kadiumpublishing.com
Publishing director:
Kathy Moynihan
kathym@kadiumpublishing.com
Networking+ is published monthly by:

Kadium Ltd, Image Court, IC113, 328/334 Molesey Road, Hersham, Surrey, KT12 3LT
Tel: +44 (0) 1932 886 537

ISSN: 2052–7373

Robert Dyas goes smart

Robert Dyas has partnered with Facilio and NJRobinson to streamline energy management practices.

The company reported a 20% reduction in energy costs, equivalent to £600,000 of savings in just three months of deploying Facilio's Connected buildings platform across its 93 stores and distribution centre. It was also able to save 285 tonnes of CO2 through its energy savings program.

"It took a combination of using the right technology and a cultural shift to get here," said Robert Dyas' CFO Charlotte Walker. "The change centred around instilling a cost-conscious culture and encouraging responsible spending. When we decided to tackle energy cost reduction as a strategic priority proactively, we found the perfect partner in Facilio - their platform meaningfully connects people, processes, and systems to achieve remarkable results."

As part of the project, smart meters were installed across Robert Dyas' 93 stores and distribution centre during off-peak hours to avoid disrupting operations. Facilio's Connected buildings platform enabled extensive visibility over the entire portfolio of stores, along with access to real-time insights and analysis into consumption. Real-time reports and indicators such as heatmaps and energy consumed per square meter, etc. helped identify the exact causes for a spike in energy consumption and take corrective action.

"The energy crisis of 2022 prompted many companies in the retail sector to reassess their approaches to energy consumption," said Prabhu Ramachandran, CEO of Facilio. "The rising energy prices weren't helping either, taking this into the boardroom discussions of most UK-based enterprises. But Robert Dyas was one of the few who had the foresight to proactively address energy optimization on a larger scale through their cultural transformation and technology-driven strategy. Their readiness allowed them to navigate intricate compliance regulations and mounting cost pressures confidently."

"This project was a testament to the fantastic collaboration between all teams, including operations, finance and store managers, and proof that significant energy savings, supported with data that delivers actionable insights, can be achieved with limited resources and capital expenditure," said Nick Robinson, managing partner at NJ Robinson. "Facilio enabled the teams to access and action the insights on energy consumption within minutes, allowing those small incremental changes to be made that delivered such great results for Robert Dyas." ■

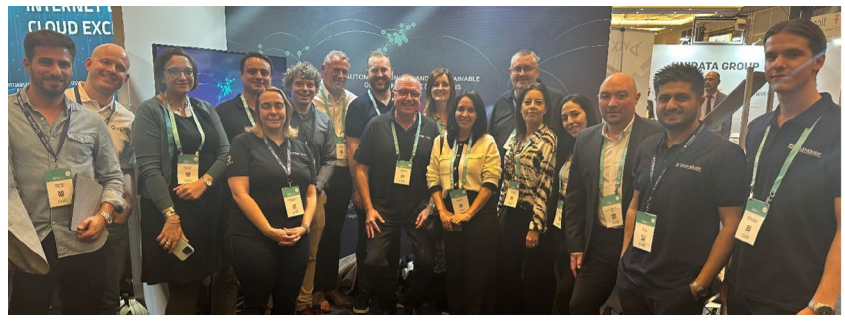
Inter.link joins forces with LINX and Telehouse

Inter.link has partnered with Telehouse and gained membership with the London Internet Exchange (LINX) following the introduction of its first UK point of presence.

The company plans to provide sustainable, automated connectivity to the internet. Telehouse's London Docklands site is the primary home of LINX and Europe's most connected data centre campus. Along with growing its UK presence, Inter.link and Telehouse share mutual commitments towards sustainability, with the London Docklands site also powered by 100% renewable energy.

"We are pleased to welcome Inter.link to the LINX member network in the UK," said Jennifer Holmes, LINX COO. "The organisation is a new and fast-growing Network-as-a-Service provider and it's great to hear that peering at LINX in London was top of the agenda when building a new point of presence in the UK."

"As we've expanded into the UK it only makes sense for us to partner with Telehouse and LINX given their strong presence in the region," said Interlink co-founder and CEO Theo Voss. "Working with them will help us to provide sustainable connections to our customers in the UK and beyond." ■



90% of successful cyber-attacks achieved via phishing

The new 'Cybersecurity Market Report 2023-2033,' co-sponsored by the Cybersecurity and Infrastructure Agency (CISA) and the National Cybersecurity Alliance, has revealed that a staggering 90% of successful cyber-attacks commence with a mere phishing email.

The findings have highlighted that some 74% of breaches include a human element, encapsulating aspects like social engineering, errors, and misuse. Now more than ever, it's vital for businesses, entrepreneurs, and managers to be acutely aware of the digital landscape and threats that permeate it.

The world is becoming increasingly digitised, and with that transformation comes expanded cyber threats. In 2023, the global revenue for the Cyber Security Market is forecasted to exceed US$200.6 billion, with projections indicating significant growth up until 2033. Small businesses, often operating on tighter budgets, face the predicament of either allocating resources to cybersecurity or other essential operational requisites. ■

Essex Fire and Rescue unifies communications

Essex County Fire and Rescue Service (ECFRS) has chosen Motorola Solutions' command centre technology, including Control Room Solution (CRS) for its call handling and emergency dispatch capabilities. The solution supports ECFRS in handling incoming emergency calls from the public and responding to incidents.

Motorola Solutions' Control Room Solution provides a unified system for emergency call handling, incident command and resource deployment, with an intuitive and highly configurable user experience. It also enables flexible operational practices to support collaboration and mutual assistance between fire services during spate conditions, where a large number of calls are received simultaneously.

"When an emergency call comes in, our priority is to assess the risks and get a response team to the incident as quickly as possible," said Becky Sutton, station manager for control, ECFRS. "Our control room team needs tools that enable them to effectively take calls and deploy resources, so they can focus on gathering real-time information from the caller and offering life-saving advice. This is vital to ensure our teams can prioritize emergency response and keeping the public safe."

"Control room operators at Essex County Fire and Rescue Service face complex workflows and significant amounts of data, managing situations where every second counts," said Fergus Mayne, U.K. and Ireland country manager, Motorola Solutions. "Working closely with fire services, we continue to innovate to bring intelligence to the forefront when and where it is needed." ■

Future spectrum allocation up for discussion across the UK

Ofcom may change the way in which radio spectrum for the next generation of wireless broadband networks is allocated. Going forwards, greater emphasis may be placed on spectrum sharing and flexible access, which will significantly impact network operators, enterprises, and the way business is done, across the UK.

Ofcom is considering the future introduction of new versions of WiFi (beyond WiFi 7) and 6G mobile, as well as a range of new wireless technologies and deployment models, such as connectivity from the sky and space (non-terrestrial networks or NTNs). Significant improvements in availability, reliability, performance, and choice are expected from these. The regulator refers to such future networks under the blanket term Next Generation Wireless Broadband (NGWB) technologies.

Radio based sensors are likely to play an increasing role in the operation of wireless networks and offer new functionality for applications that run over them – such as positioning and sensing for autonomous robots and data collection for digital twin applications.

Such capabilities maybe particularly valuable when deployed within local networks in industrial sites such as factories and warehouses. With advances in signal processing and antenna design, combined sensing and communications technologies could become a future feature of NGWB networks. ■

Neos Networks adds new DCs in London and Manchester

Neos Networks has expanded its data centre estate with two high profile sites added in London and Manchester.

The first site – which has now gone live - is the Equinix MA5 data centre in Manchester. Neos Networks is one of the first to offer services out of that location. The second site, Telehouse South (THS) in London Docklands, the largest facility offered by Telehouse, will come on-net in the months to come.

Both data centres will be diversely connected with fibre and 100Gbps enabled, providing UK businesses with secure, reliable, high-capacity connectivity services.

"We continue to invest in our data centre offering, expanding the reach of our network to bring critical, core connectivity to more UK businesses. And these two new locations will be highly significant in complementing the growth of the UK's two biggest cities," said Matt Rees, CTO of Neos Networks. "We see huge demand for high-capacity services from the Telehouse sites that we've brought on-net to date, providing reliable, resilient and secure connectivity to help power the UK's financial services industry in London's Canary Wharf. And with Manchester at the heart of the UK's digital tech scene, ensuring the availability of scalable, reliable connectivity is essential for digital services innovation and establishing the UK's technology leadership." ■

Word on the web...

How SD-WAN & public cloud have changed modern connectivity

Stephen Amstutz, director of innovation and Joe Langan, solutions architect, Xalient

To read this and other opinions from industry luminaries, visit www.networkingplus.co.uk

Why hybrid cooling is the future for data centres

Gordon Johnson, senior CFD manager, Subzero Engineering

Data centres (DCs) are experiencing increasing power density per IT rack. In 2020, the Uptime Institute found that due to compute-intensive workloads, racks with densities of 20kW and higher are becoming a reality for many DCs.

This has left DC stakeholders wondering if air-cooled IT equipment (ITE), along with containment used to separate the cold supply air from the hot exhaust air, has finally reached its limits.

Moving forward it's expected that DCs will transition from 100% air cooling to a hybrid model encompassing air and liquid-cooled solutions. Those moving to liquid cooling may still require containment to support their mission-critical applications, depending on the type of server technology deployed.

One might ask why the debate of air versus liquid cooling is such a hot topic in the industry right now? To answer this question, we need to understand what's driving the need for liquid cooling, the other options, and how can we evaluate these options while continuing to utilize air as the primary cooling mechanism.

Air and liquid cooling successfully coexisted until the industry shifted primarily to CMOS technology in the 1990s.

With air being the primary source used to cool DCs, ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) has worked towards making this technology as efficient and sustainable as possible. Since 2004, it has published a common set of criteria for cooling IT servers with the participation of ITE and cooling system manufacturers - 'TC9.9 Thermal Guidelines for Data Processing Environments.'

ASHRAE focused on the efficiency and reliability of cooling the ITE in the DC. Several revisions have been published with the latest being released in 2021 (revision 5). This latest generation TC9.9 highlights a new class of high-density air-cooled ITE (H1 class) which focuses more on cooling high-density servers and racks with a trade-off in terms of energy efficiency due to lower cooling supply air temperatures recommended to cool the ITE.

As to the question of whether air and liquid cooling can coexist, it's done so for decades already.

It's easy to assume that when it comes to cooling, a one-size will fit all in terms of power and cooling consumption, but it's more important to focus on the actual workload for the DC that we're designing or operating.

A common assumption with air cooling was that once you went above 25kW per rack it was time to transition to liquid cooling. But the industry has made some changes, enabling DCs to cool up to and even exceed 35kW per rack with traditional air cooling.

Up to around 2010, businesses utilized single-core processors, but once available, they transitioned to multi-core processors. However, there was still a relatively flat power consumption with these dual and quad-core processors, which enabled server manufacturers to concentrate on lower airflow rates for cooling ITE, resulting in better overall efficiency.

Around 2018, with the size of these processors continually shrinking, higher multi-core processors became the norm and with these reaching their performance limits, the only way to continue to achieve the new levels of performance by compute-intensive applications is by increasing power consumption. Server manufacturers have been packing in as much as they can to servers, but because of CPU power consumption, in some cases, DCs were having difficulty removing the heat with air cooling, creating a need for alternative cooling solutions, such as liquid.

Manufacturers have also been increasing the temperature delta across servers for several years now, which again has been great for efficiency since the higher the temperature delta the less airflow that's needed to remove the heat. However, server manufacturers are, in turn, reaching their limits.

There are several approaches the industry is embracing to cool power densities up to and even greater than 35kW per rack successfully, often with traditional air cooling. These options start with deploying either cold or hot aisle containment. If no containment is used typically, rack densities should be no higher than 5kW per rack, with additional supply airflow needed to compensate for recirculation air and hot spots.

What about lowering temperatures? In 2021, ASHRAE released their 5th generation TC9.9 which highlighted a new class of High-Density Air-Cooled IT equipment, which will need to use more restrictive supply temperatures than the previous class of servers.

At some point, high-density servers and racks will also need to transition from air to liquid cooling, especially with CPUs and GPUs expected to exceed 500W per processor or higher in the next few years. But this transition is not automatic and isn't going to be for everyone.

Liquid cooling is not the ideal solution for all future cooling requirements. The selection of liquid cooling over air cooling has to do with a variety of factors, including specific location, climate (temperature/humidity), power densities, workloads, efficiency, performance, heat reuse, and physical space available.

This highlights the need for DC stakeholders to take a holistic approach to cooling their critical systems. It will not and should not be an approach where we're considering only air or only liquid cooling moving forward. Instead, the key is to understand the trade-offs of each cooling technology and deploy only what makes the most sense for the application. ■

Now is the time for quantum-proof network security

Duncan Jones, head of cybersecurity, Quantinuum

For many, the countdown to 'Q-day' has begun. Quantum computing has seen a series of technological and commercial breakthroughs in the past year that have led to it gaining attention as a quickly emerging technology — one that, alongside its boundless benefits, poses a direct threat to our current cybersecurity technologies and infrastructure. Now is the time for network providers to start their quantum security journey.

The exact timeline for the emergence of a quantum cyber threat is unclear. The consensus, shared by the likes of the Quantum Economic Development Consortium, is that we are between 5 and 15 years away from quantum computers being able to break current encryption standards. However, cyber criminals may already be stealing encrypted information with the view to decrypting it on a future quantum computer. This is known as a 'hack now, decrypt later' attack.

"Cyber criminals may already be stealing encrypted information with the view to decrypting it on a future quantum computer. This is known as a 'hack now, decrypt later' attack."

Many of the encryption systems used today are based on a family of mathematical problems that are easy to solve in one direction but intractable in the other. For example, RSA is one of the oldest and most popular algorithms for encrypting internet data and for digitally signing transactions. RSA relies on multiplying very large integer numbers, which is a trivial task for any classical computer. However, the reverse process – factoring a very large number – would take thousands of years using even the world's fastest high-performance computers.

Quantum computers work differently. A sufficiently powerful and stable quantum computer running Shor's Algorithm would be able to find the two factors of a large number in a reasonable amount of time, potentially in minutes or seconds. This means an attacker with a powerful quantum computer could efficiently read sensitive data encrypted using an RSA public key or forge transactions signed by an RSA private key. This completely breaks the bedrock of our cybersecurity systems.

Today's quantum computers are not yet powerful enough to run Shor's algorithm at a level required to break modern cryptography. Yet with each year we see new developments in the stability of quantum computers with increasing numbers of qubits. This drives the need for quantum preparedness today, ahead of such quantum computers becoming available. Some experts, such as Sundar Pichai of Google and Michele Mosca of the University of Waterloo, say quantum machines will be powerful enough to break current encryption standards this decade.

First steps

To defend against the cyber threats posed by future quantum computers, a competition has been underway for six years by NIST to find new quantum-resilient algorithms. In July 2022, the first group of algorithms were selected by NIST, with a view to be incorporated into a post-quantum cryptographic standard by 2024. Countries around the world are expected to adopt these US standards, once released.

However, the absence of a finalised post-quantum standard should not deter network providers from starting their preparations now. One step that can be taken is to reinforce security measures with quantum-computing-hardened encryption keys — something that is already achievable with the quantum computing capabilities available today. These keys are so much stronger that they are effectively impossible to predict, even by future quantum computers. This provides a level of future-proof security to networks that can be deployed today, which can be further built on when post-quantum algorithms become fully ratified by the likes of NIST.

Network providers have already started looking at how to make their network infrastructure quantum resilient. In early 2022, PureVPN, a global virtual private network provider with customers in 78 countries, adopted quantum-computing-hardened keys so that it could offer enhanced privacy to customers and take the first steps towards a broader quantum-resilient infrastructure. The company can now generate encryption keys through a simple API call request, using a technology that seamlessly integrated into its existing security infrastructure.

Although businesses are still in the earliest stages of adopting quantum computing, PureVPN's adoption made apparent a strong public interest in quantum technologies. Not only did the quantum investment strengthen its network security, but PureVPN also saw a 40% increase in new business enquiries following the integration's announcement.

The mindset behind PureVPN's decision to proactively invest in quantum is one that many network providers should consider. Speaking on the decision, co-founder and CEO of PureVPN Uzair Gadit said: "We take the security of our users too seriously to rely just on mere speculation on when, not if, quantum technology will advance or completely destroy privacy. When quantum computers raise the stakes between codemakers and codebreakers, we want to be on the right side of history, or in this case, the future."

The quantum cyber threat may still be a decade away, but now is the ideal time for network providers and engineers to prepare for it. ■

How do we measure sustainability?

Alan Hayward, sales & marketing manager, SEH Technology UK Ltd

In today's marketplace, sustainability strategies are no longer an option. In addition to driving environmental change, these initiatives can help contribute to a company's overall success. Consumers are happy to spend more if they know that the organisation they are purchasing from is sustainable, boosting the business' profitability in the long run. What's more, companies with higher ESG ratings are more likely to outperform their competitors, so making the initial investment in sustainability best practices can drive real and subsequent returns.

Benefits of measurements

Organisations must begin measuring their sustainability performance to make continuous improvements, track progress, evaluate areas of strength and make data-driven decisions. This requires business leaders to select key sustainability metrics that will provide real-time data to mitigate risks. Measuring sustainability allows companies to identify their impact on the triple bottom line factors of environmental, social and governance.

Sustainable companies are better prepared for unexpected circumstances as it creates resilience. Measuring sustainability as an internal process will provide businesses with areas to focus on to reduce risks and build out a contingency plan. For stakeholders, sustainability has become a key performance indicator, and measuring these factors can help organisations further engage with a diverse range of people who have a vested interest in ESG.

KPIs to measure success

Data is vital for businesses in their drive to become more sustainable. Establishing KPIs will allow them to measure results against predetermined targets to uncover the success of their strategy implementation. There are several KPIs that businesses can use to create actionable sustainability indicators:

Carbon footprint
Carbon footprint is somewhat of a buzz word in the IT sector, but it is in fact one of the most important KPIs to measure against as it encompasses the company itself, its suppliers and customers. By measuring their emissions, businesses can assess how their products or services are impacting climate change.

Consumption of energy
Organisations can also investigate how much energy their operations consume and build a better understanding of where they can use less resource to boost cost savings for the company. Business leaders can look to implement digital tools that will help measure how much energy is being used in different areas of the organisation.

Waste reduction
As customers are becoming more conscious of sourcing product materials and recycling, businesses need to start making some changes to their procurement processes to remain competitive. They can do this by monitoring their waste management to ensure that their products and services are sustainable or could be part of a circular economy.

Social impact
Consumer buying behaviour is constantly changing, which can often determine what information a business needs to report in terms of its suppliers, environment, social and governance. This stresses the importance of organisations becoming more transparent in their communications with consumers and other stakeholders.

Engaging employees

Becoming a sustainable organisation is much easier when all employees are on board. Ensuring that the whole business, across all departments, is committed to making greener decisions will help leaders to revolutionise the way they do business and ensure long term success. The most important way to engage employees is by educating them on sustainability and helping them to understand why new ESG practices are being introduced. Businesses need to outline what the main aims are and decide specific areas of focus, before communicating these to employees to make sure they are all on the same page.

Furthermore, companies can consider asking employees for input in their practices to give them a sense of control and encourage them to make more sustainable decisions. Not only will this improve workplace satisfaction and boost productivity, but it will also encourage them to be more environmentally friendly and ethical.

Future of IT sustainability

There is no one-size fits all approach. Businesses vary in size, scope, needs and industry demands, meaning that detailing exactly what ESG looks like can be difficult. In addition, sustainability involves a growing number of factors, meaning that the amount of data needed by businesses to measure success has to be taken into account. Organisations must adopt sustainability as a core business component and build out a set of KPIs that can be used by the whole company to measure long term success. ■

Callum White

Andreas Sila

Dave King

Slawomir Dziedziula

Roundtable: building a better data centre

Data centre design and management faces increased pressure amidst the growing demand for environmentally responsible infrastructure. We asked the experts their views on the sustainable DC of the future

Which elements are key to building and maintaining a sustainable data centre (DC)?

Callum White, sales director, Critical Power Supplies: It's estimated that DCs are responsible for as much as 3% of global electricity consumption. The amount of data created and stored will continue to grow exponentially over time, so DCs must become more sustainable.

As such, the industry must focus on energy efficiency and renewable energy integration. This means enhancing power monitoring and measurement capability to help understand consumption, creating a baseline for future savings, and identifying potential renewable energy source alternatives.

As DCs are so energy intensive, they also create a lot of heat, much of which can be captured to power infrastructure and other areas of a facility.

Andreas Sila, vice president data center and fixed access network, HUBER+SUHNER: The heart of any DC comprises essential components such as routers, switches, firewalls, storage systems, and servers, all dedicated to its core function. The journey to establish a sustainable DC necessitates a concerted commitment towards efficiency and mindful material choices. This extends to energy and water efficiency, waste minimization, construction materials, and even the strategic selection of the DC's location.

It is imperative to comprehensively assess and address all sustainability aspects when embarking on the construction of a new DC. This means carefully looking at important factors to ensure the facility aligns with environmentally responsible practices and contributes positively to our collective efforts to combat climate change.

Dave King, senior product manager, Cadence: There are two crucial elements to building and maintaining a sustainable DC: experimentation to optimize performance and energy efficiency in the design stage; and ongoing operational analysis.

Deploying a digital twin allows facility managers to analyze DC design before they implement changes on-site. This can help visualize the most sustainable layout to minimize energy consumption and waste as well as conduct ongoing monitoring to identify what changes can be made to enable the most sustainable outcomes from existing facilities and resources. The ongoing use of digital twin technology, using physics-based simulation, helps maintain efficiency when the DC becomes operational. Customized reports and dashboards allow visibility of important metrics to make informed decisions.

Slawomir Dziedziula, director MultiLOB and IRS application engineers EMEA, Vertiv: Using alternative energy sources like solar or wind power can help reduce carbon emissions. Implementing Battery Energy Storage Systems (BESS) can help store renewable energy for backup and continuous power delivery. Moreover, the latest UPS systems can enable dynamic grid support features to help balance time on the grid and implement peak shaving.

Meanwhile, designing and maintaining the facility to achieve the lowest Power Usage Effectiveness (PUE) can be achieved with efficient cooling units, including free cooling and efficient air delivery e.g. use of containments and/or multi-speed fans.

Thermal management control logics allow the automated operation of the cooling units and help reduce waste through the adjustment of fan speed, multi-stage compressors and air supply temperature.

Applying for sustainability DC certifications to demonstrate that services have been audited and assessed by a credible third party such as Building Research Establishment's Environmental Assessment Method (BREEAM), Leadership in Energy and Environmental Design (LEED) and ISO 50001 for Energy Management gives customers confidence that DCs are meeting ecological standards in terms of both build and maintenance.

Moreover, scheduling regular DC assessments to help manage continuous improvement and optimisation, and providing training to enable local staff to develop skills to design, operate and improve the efficiency of DCs.

How important is location to sustainability?

Callum White: Location plays a crucial role in DC sustainability as it determines access to renewable energy sources, climate suitability for efficient cooling, and proximity to power sources to reduce transmission losses.

Slawomir Dziedziula: The physical location of a DC can affect its energy efficiency and environmental impact. Locations with reliable access to alternative energy sources like wind and solar power, or less chance of extreme weather events, tend to have more reliable power supplies and can help reduce energy wasted by backup systems. If a DC is required in a less than perfect location, other steps can be taken to help it to be more efficient and environmentally friendly such as efficient cooling technologies, reuse of waste heat and implementation of circular economy strategies.

Dave King: In locations with more moderate climates like the UK, the challenge is to ensure cooling systems can operate efficiently across the whole range of temperatures throughout the year, whilst still accommodating the peaks. DC managers can deploy digital twins – virtual replicas of physical DCs – that use computational fluid dynamics (CFD) to simulate which cooling layouts are the most environmentally sustainable by conserving the most energy. For example, KAO Data in the UK was able to configure its cooling systems to prioritize efficiency, conserving energy resources, using CFD simulation.

Andreas Sila: Location is a crucial factor in DC sustainability for several reasons, including access to renewable

energy, the local climate, energy grid carbon intensity, and proximity to users. The power for cooling the infrastructure is one of the main cost drivers. Those located in areas with abundant and accessible renewable energy resources have a significant advantage in achieving sustainability goals. Access to clean energy can greatly reduce the carbon footprint of DC operations.

On top of this, transportation can have a huge impact. The transportation of equipment and supplies to and from the DC, as well as employees' commuting, can also have an environmental impact. Choosing a location with access to efficient transportation systems can reduce the environmental impact of the DC, while DCs located closer to the end-users can reduce the energy required for data transmission, as shorter network distances result in lower energy consumption. This is a consideration for edge DCs, which aim to bring computing resources closer to their point of use.

Is it possible to create a truly net zero DC?

Slawomir Dziedziula: Yes! DCs that can produce as much energy from sustainable sources as they consume can be considered as net-zero because their operations result in a zero-carbon footprint.

However, the manufacturing and disposal of DC equipment is an important aspect that involves the entire supply chain and includes scope 3 emissions, where more efforts are needed to reduce the carbon footprint. But what shouldn't be underestimated is the changes DCs are making to improve - like other organisations, DC operators are on a journey to net zero - a journey on which they are fully committed and that will ultimately lead to environmental improvements.

Callum White: With advancements in technology and renewable energy integration, it is indeed possible to create a truly net zero DC that operates on 100% renewable energy and offsets its remaining emissions. The technology and solutions exist. The good news is that pressure is intensifying on DCs to become carbon neutral as part of Scope 3 emissions, there's a growing commercial need to make it happen.

Andreas Sila: Creating a truly net zero DC is a challenging goal, but it is theoretically possible with the right combination of strategies and technologies. Achieving net zero status for a DC would require a comprehensive and holistic approach that addresses both energy consumption and carbon emissions throughout the DC's lifecycle.

A great example of DC operators aiming for net-zero can be seen near HUBER+SUHNER's Switzerland headquarters. This DC is Tier IV certified and uses solar panels on its roof and walls. What's even more impressive is that it recycles its waste heat to heat a nearby cheese dairy.

Dave King: Reaching net zero isn't currently a feasible reality for DCs due to compute-heavy demands and the growth in data-driven businesses. However, ongoing initiatives and a commitment to sustainable practices are steadily minimizing DC impacts. For example, the introduction of the EU Corporate Sustainability Reporting Directive – which will require roughly 50,000 large companies and SMEs across Europe to share the environmental impacts their organizations have – shows a massive step in the right direction. As does energy efficiency optimization with low PUEs.

What can we expect from the DCs of tomorrow?

Andreas Sila: The DCs of tomorrow are poised to be at the forefront of sustainable technology and practices, aligning with both environmental stewardship and economic viability. Commitment to energy efficiency, environmental friendliness, and integration into a broader sustainable ecosystem will not only help reduce carbon footprints but also lead to cost savings in the long run. As energy costs continue to rise and environmental concerns gain prominence, sustainable DCs will be well-positioned to meet the challenges of the future while setting a positive example for the broader technology industry.

Slawomir Dziedziula: All DCs will strive for improvements and set clear goals, including timelines, that will enable their facilities to meet government requirements and follow best practices to be more environmentally friendly. The DCs of tomorrow are expected to be powered by 100% renewable energy and meet high standards for energy efficiency. They are also expected to utilise any waste heat they will produce to benefit local communities e.g. district heating systems and vertical farms.

Callum White: Governments and commercial enterprises cannot meet their net zero commitments without the decarbonisation of DCs. It's a dual challenge. On the one hand, tomorrow's DCs need to be modular and scalable to accommodate the rapid growth of digital information. On the other, the most sustainable DCs in the future will need to prioritise several crucial elements, including renewable energy integration, energy-efficient designs, waste heat recovery, water conservation, circular economy practices, carbon offsetting, and transparency in reporting environmental metrics.

Dave King: The most sustainable DCs of tomorrow will offer a comprehensive approach to environmental responsibility where this is prioritized over pure capacity. Digital twin technology will be a key tool in their arsenal for achieving this as they can be leveraged for efficient design and optimization.

Other things DC managers will be doing include prioritizing renewable energy sources, maintaining low PUEs, and limiting water usage. Future-proofed DCs will also have rigorous recycling practices as they continually work to minimize their environmental impact. ■

Tackling the UK's urbanisation with smarter cities

Smart city projects are advancing in leaps and bounds across the UK. But how are communications service providers helping support the growing drive for greener urban centres? We checked in with those in the know.

Making cities smarter

Smart cities hold the potential to change the world, improving everyday life as well as helping tackle the environmental impact of expanding urbanised centres. As sustainability concerns further embed themselves within society and technology adoption remains critical for economic growth, local authorities across the UK are looking to incorporate more smart technologies into their cities.

At their core, smart cities rely entirely upon the smooth running of communications networks.

"Communication service providers have a key role to play here, as the underlying digital infrastructure required to support the adoption of these technologies relies upon futureproof fibre connectivity with high capacity and low latency characteristics," says Joanne Green, head of public sector, Neos Networks.

Indeed, smart cities depend on reliably connecting sensors, devices and people so that data can be securely collected, processed and shared in real-time for the benefit of its inhabitants, says Kunal Shukla, senior vice president of technology, Digital Barriers. "By providing reliable, secure, and high-speed connectivity, communication networks can help to improve the efficiency of city operations, make better decisions, and ultimately improve the quality of life for citizens."

"Communications networks are the new foundational infrastructure for smart cities," agrees Hubert Da Costa, CRO, Celerway. "Much like the boulevards and highways we built for our first urban centres, communications networks today are the backbone for knitting together technologies, businesses, and communities. They are the key to empowering smart cities to become places of increased business productivity, efficiency, customer satisfaction, closer human connections, and even improved mental well-being."

Ilan Barda, CEO of Radiflow, believes that by integrating information technologies (IT) and operational technologies (OT), these networks facilitate seamless real-time data exchange, powering different aspects of smart cities including transportation, healthcare, utilities, and public safety.

"Communications networks enable continuous data collection from sensors, cameras, and IoT devices," says Barda. "The data gathered is transmitted to central control centres. Analysing this data helps improve city services with better informed decisions. These networks also empower real-time monitoring and control of critical infrastructure, aiding efficient traffic management and swift emergency response."

However, without upgrading ill-equipped legacy network infrastructure, smart city projects risk being unable to reach their full potential, warns Green. "As urban needs continue to develop and change, network infrastructure must be prepared to withstand new demands on the network and sustain into the future. For network infrastructure providers, this means working closely with local authorities to assist in the routing and planning of network upgrades and ensuring reliable connections are in place."

Securing the smart city

Ensuring data security in an era of smart city technology adoption is of paramount importance for the protection of enterprise, government, and consumers alike. With the expanding volume of data generated, it is imperative to take a holistic approach that prioritises data privacy and security by design at all layers.

"A privacy impact assessment should be conducted for all smart city deployments that collect or process personal data," says Shukla. "There should also be clear governance frameworks in place to ensure privacy and security are always front of mind in the design, development, and operation of smart city solutions."

Having a policy that drives zero trust is vital, agrees Da Costa: "true end-to-end zero trust must be available wherever the business or end user is to minimise their exposure to cyber threats. With such data-rich environments and interconnectivity, this approach ensures both the protection of sensitive data and the protection of privacy for enterprises and individuals."

"From a technology standpoint, the encryption of all data at rest and in transit, the implementation of strong protocols for authorisations, and authentication and the use of data anonymisation wherever feasible are just some of the protections that should be put in place," adds Shukla.

Meanwhile, according to Barda, the key is full asset visibility with always-on detection engines, enabling complete management of the smart city's OT cyber risk. That way, he says, you'll be able to identify what might be threatening the network and can alert on suspicious behaviours while ignoring the countless conditions that are irrelevant.

"A stepping stone to achieving this level of visibility is finding a way to benchmark your security posture, helping to identify the key areas that need improvement. Also, the best 'tried-and-tested' disaster recovery procedures are necessary, too. These must be used in case of successful smart city attacks to minimise downtime," says Barda. "The tighter the security the better."

Despite all these measures, however, breaches can happen. "Having a well-defined incident response (IR) plan allows for prompt addressing of security issues and minimisation of their impact," adds Barda.

The answer to urbanisation?

Statista reports that the UK's population stands at some 67.6 million, and while growth rates are slowing, the population is expected to hit 74 million by 2060.

"Smart cities are the inevitable way forward to housing a growing UK population," says Da Costa. "The challenge will be to achieve a balance that will retain the sense of village and town community that has been a staple for this country for so long. We require a happy medium whereby we address the critical requirements needed to drive security and safety to the UK population while also fostering the long-lived community spirit that people love."

Like much of the rest of the world, rapidly expanding urbanisation is becoming a challenge in the UK.

"Smart cities are becoming a key way to mitigate the adverse effect of increasing urbanisation," says Green. "By integrating technologies which manage carbon-emitting infrastructure and support urban planning, local authorities can adjust resource allocations for public services and better meet the needs of their constituents."

As pressure continues to mount on public services, smart technologies that help to save time, labour and resources will be key to ensuring everyone can access the required services.

"Not only will smart solutions be critical in extending the longevity of UK infrastructure, but they will also be a key driving force behind meeting the ambitions set out in the government's levelling-up plan," adds Green. "By automating services and using data insights to highlight untapped revenue streams and areas where resources can be reduced, local authorities can reinvest resources into regeneration and future growth."

Smart city projects can be critical drivers of economic growth, making a city more attractive for business, stimulating job creation and tax revenues.

"When implemented effectively, these projects create a self-powered productivity loop that can equalise a community, encouraging a more inclusive economy," finishes Da Costa. "Ultimately, as more and more intelligence moves to the edge, smart cities will require a new level of edge connectivity capability that will benefit and empower everyone from every corner of society." ■

Hubert Da Costa

Joanne Green

Why enterprise must explore IoT when seeking reduced carbon emissions

Anton Le Saux, sales director, Zest4 IoT

IoT - it's not just a buzz word. Businesses are looking to change how they run to make sure they limit their impact on global warming, an issue frequently raised on news stations. But these pieces tend to only mention production or manufacturing as an issue; they don't look to the smaller changes every business can make to have a greater global impact.

Intelligently cutting carbon emissions

So how exactly can IoT help businesses reduce carbon emissions?

For fleet managers, predictive maintenance and advance notice of servicing requirements help businesses ensure that vehicles are kept on the road for longer and a well running vehicle is likely to cost less and contribute to reducing emissions. Monitoring the temperature inside cabins and haulage solutions, making sure they are optimised, and alerting the right people to fix it if anything goes wrong is just one way that IoT can help. Without fluctuating temperatures, a consistent read will save money and create less emissions. Similarly, tyre pressure monitoring can ensure that the vehicle is running optimally, is not using excessive fuel, meaning less wear on tyres and less frequent replacements.

According to industry experts, insurance providers are experiencing a 9.5% yearly increase in the number of fraudulent claims received, giving a strong basis to encourage the adoption of dash cams for automotive fleets. Indeed, in-vehicle cameras not only provide accurate and admissible video evidence of any incident, but they also change the way drivers drive - it's like having the fleet manager sat with them, watching how they carry out their duties. Fuel-savings are a by-product of better, safer driving. Once drivers have a dashcam solution installed, they adopt a different mindset, with less wear and tear on the vehicle and more considered fuel consumption. All this leads to less emissions, an effective win for any business.

For the smart city, traditional networks and services are made more efficient with the use of digital solutions for the benefit of its inhabitants and business, which goes beyond the use of digital technologies for better resource use and less emissions. For public services under the scrutiny of the general public, creating greener living spaces has never been so important. Smart cities created using IoT solutions can cut carbon emissions, make the air cleaner and increase safety for all those who live or work in it.

Meanwhile, lights that are only used/switched on when they are needed save not only money but also energy. Lamps that are triggered by movement can have a huge impact on safety of occupants, making sure that streets are lit when they need to be, not when it's assumed they might be used.

Traffic management, keeping traffic flowing and ensuring public places remain clear of parked vehicles are critical when planning a smart city. With the use of connected CCTV systems and ANPR recognition cameras, local authorities and emergency services can ensure that routes are clear, traffic is flowing and change and re-route traffic when required to avoid hot spots and congestion in the city centre. These systems can also be used to identify accidents and accident hot spots and ensure that emergency services can be on the scene with minimum fuss and in optimum time. A by-product of the smart CCTV deployment is also a reduction in crime and crime hotspots.

Moreover, studies carried out around city centres when monitoring traffic and congestion have showed that on average people driving into the city can spend up to 20 minutes driving around looking for a parking space. Smart parking solutions allow drivers to find out and in some cases reserve and pre-book parking spaces removing the need to drive around wasting time, fuel, and contribution to the emissions in the city. Bus stops, billboards, and other digital displays that you see around most city centres can all be used to direct traffic, inform on public transport routes and timings as well as delivering advertising and messaging for consumers and travellers. Some cities are also adapting these services to measure and report on the cleanliness of public spaces, crowd density and movement and flow of vehicles.

"According to industry experts, insurance providers are experiencing a 9.5% yearly increase in the number of fraudulent claims received, giving a strong basis to encourage the adoption of dash cams for automotive fleets."

Waste management is another IoT application for reducing carbon emissions. Imagine if bins were emptied when they were full, rather than on specific collection days, when there could either be far too much rubbish overflowing to the street, or empty bins, depending on usage. If public bins had sensors, routes could be created on a need-to-use basis rather than street by street, saving pointless collections and keeping streets cleaner and safer.

Smart buildings, too, can bring a significant cut in carbon emissions compared to their 'dumb' counterparts. How many times in your office building have you walked into an empty meeting room where the lights have been left on, or the heating or air con is running, and no one has been in there for hours? Building automation and the use of smart thermostats and switches can not only reduce energy utilisation and costs (reducing the carbon footprint) but can also help recognise failures such as water leaks, gas leaks etc. Another element to the smart building is occupancy management, knowing exactly how many people are using specific areas such as break rooms and bathrooms, or managing hot desking by pre-booking and finding empty desks and rooms via automation.

Round-up

It's better to not just look at consumption where savings in emissions can be made. Businesses and the public sector need to work smarter, and to do that, they need to deploy IoT solutions. If they did, they'd see less incidents over time, improved driver performance improvement, lower running costs of vehicle fleets, safer streets, greener cities, and healthier populations. ■

Toyota Motor Manufacturing UK goes green

ESCO (Energy reduction Support & Collaboration) is the energy-supporting function of Toyota Motor Manufacturing UK, with a remit to manage utilities and consumption, which is done in two ways: using Kaizen, a Continuous Improvement concept and foundation of lean manufacturing; and abnormality management.

Saving energy wirelessly

One of its tasks is to find out when too much energy is being consumed, either through abnormality or through equipment not being turned off.

The company is focusing on meeting its 2030 milestone target, part of the Toyota Environmental Challenge 2050, to become a net-zero business. Monitoring and managing energy consumption is a big part of this agenda. Cost savings are also key given the rapidly increasing rise in energy prices.

ESCO has a challenge to reduce the utilities cost required to produce a vehicle by 2% year on year, which through volume increase changed to 7.5%. In 2020 the group identified which equipment consumes most energy at transformer level, but couldn't see the granular detail, i.e. whether each piece of equipment was operating at its optimum and expected level. With multiple production zones at the site, monitors had to cover thousands of square metres with many obstacles to their signal. Finally, the monitoring solution over such a vast area had to be cost-effective in both product and installation time and cost.

The company wants to be able to view every piece of equipment's energy consumption and condition in real-time.

Non-intrusive installation

The Toyota team trialled Pressac's wireless current monitoring sensors to monitor energy consumption and machine condition and was impressed by the lack of intervention and maintenance needed for the equipment (wireless, self-powered CT sensors simply clamp around power cable). The installation of sensors was smooth, without any production downtime. Pressac also advised how to set up initial visualisation of data.

ESCO uses a modular system called Ignition, which includes built-in MQTT, a standard messaging protocol for the Internet of Things. They established that Pressac's sensors would integrate well with this system. The ease of use, cost viability and quick installation ticked all the boxes they were looking for.

Toyota has currently fitted around 300 wireless current sensors to energy-intensive key significant equipment, such as painting ovens. They have also been installed on lower-level kit, which were more unknown entities in terms of energy consumption. From here, they have created an energy map of different aspects of their production process.

Additionally, they have installed pulse counters to understand gas consumption, as well as CO2, temperature, and humidity sensors to monitor status on the shop floor and keep optimal indoor air quality conditions for team members through HVAC systems.

Real-time visualisation

The team has been able to create a highly detailed view of not just each type of equipment fitted with sensors, but each individual control panel. For example, one injector moulder purely used for service parts was identified as ticking over at a high-power level. This has now been modified, still ticking over to keep it fully functional but no longer consuming energy when not needed. Savings on this piece of kit alone has seen energy consumption in non-production periods reduced by 82%.

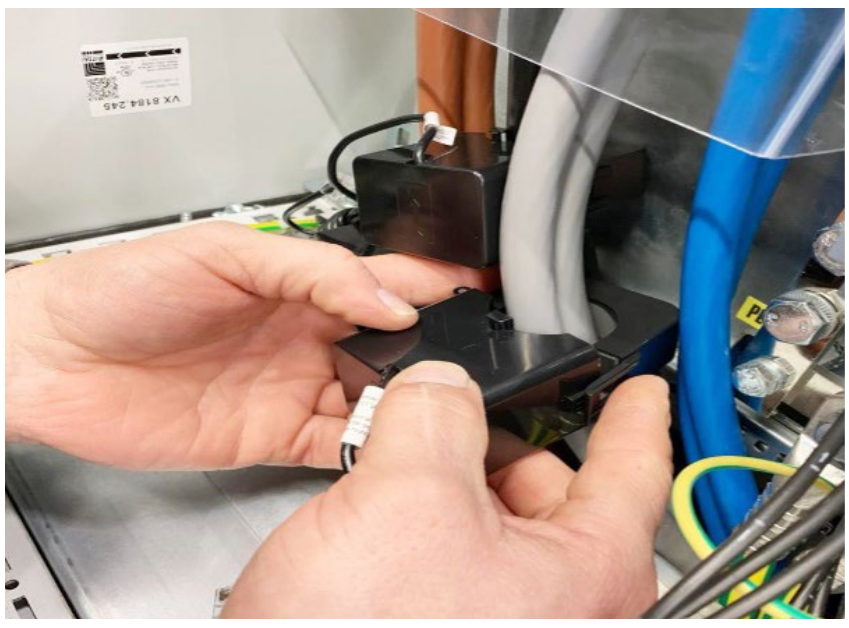
This type of energy monitoring can now be done for all pieces of equipment with the CT sensors, with the team able to break down into patterns, e.g. if one shift is turning off equipment and another isn't.

"The big advantage of using the Pressac current sensors is the simplicity and increased safety of non-intrusive installation," said Graham Lane, ESCO group leader, Toyota Motor Manufacturing UK.

Although the initial aim was for energy consumption, the team soon realised that the granular monitoring would help with the tandem aim of spotting abnormalities. In fact, the first area to benefit from monitoring was the water farm in 2020. The sensors highlighted a failing inverter — an abnormality — which meant the team could perform an early intervention to replace the part, preventing a shutdown and huge production impact.

The ESCO team's Energy Reduction Kaizen has increased by 100% since the installation due to the ability to identify opportunities through real-time visualisation. They have overachieved their targets for savings-per-vehicle, with significant further potential savings ahead. The investment in Pressac technology and the Ignite platform has yielded a return of 1,900% so far.

"If we look back five years, small improvements may not have been as impactful as they are today. All energy consumption savings are taking us a step further towards our carbon-neutral ambition," said Lane. "Skyrocketing energy costs also means that little interventions can have hugely beneficial results. Going forward we'd like to have every single piece of kit covered, to give us a complete model of the whole production process and identify where we can make even more energy savings." ■



CarGiant unifies communications across sites

CarGiant is the world's largest used car dealership, with a head office, car showroom and processing plant workshop of over 45 acres located in White City, London. Since 1977, CarGiant has sold over 650,000 cars to customers all over the UK. CarGiant has approximately 450 staff divided into sales, customer service, finance, IT, technicians, and administration.

Upgrading end-of-life tech

CarGiant's on-site expensive telephone system together with ISDN was quickly becoming end-of-life technology.

After a detailed consultation with Spitfire, it became clear that there was an urgent need to move CarGiant to a Unified System that was well suited to all branches and departments. The IT team was also wasting man hours having to manage multiple service providers. One of CarGiant's main requirements was a Unified System to enable fluid communication between all departments and employees, including the ability to transfer calls internally and communicate between users via extension numbers.

The Unified System had to be both easy to use from an admin perspective as well as from a user perspective. The department that required the most in terms of features was on the customer service side within CarGiant's call centre. As the department that receives most inbound queries, they had some challenging requests with regards to queuing, incoming calls, messages/chat, and emails. They also wanted social media integration and advanced reporting. In terms of day-to-day functionality, all employees wanted to make use of a softphone/desktop application together with physical handsets, and management and staff wanted to continue using Microsoft Teams as the main form of internal communication.

"What we needed was a way to consolidate our communications services to make managing it all simpler - and that's exactly what Spitfire has enabled us to do," said Marcin Slon, IT infrastructure manager, CarGiant.

Unifying the system

Once Spitfire had evaluated the requirements of CarGiant, a solution deployment plan was developed.

Spitfire was able to deploy a Unified System created by two separate systems combined via its AnySIP network. CarGiant's connectivity and telephony systems were consolidated to make it easy for CarGiant's IT team to manage more easily. Suitable internet connections were installed across all sites to ensure connectivity for the new IP telephone systems and enable seamless communication between departments and users. For the majority of users, Spitfire installed its 3CX Cloud IP telephone system, a software-based telephone system which met the requirements for reporting, usability, and softphone/desktop apps.

"If we have any issues they are addressed quickly by our account management team," said Slon.

For CarGiant's call centre, Spitfire provided SIP Trunks for their Microsoft Teams telephone system managed by a 3rd party IT company, which, integrated with call centre software, was able to provide the email queueing as required. Lastly, as Spitfire had already provided the company with voice-approved data circuits, call quality could be guaranteed for all users with the exception of the call centre as the SBC was hosted in a third party data centre.

With Spitfire, CarGiant has been able to completely modernise its connectivity and telephony infrastructure. The upgrade has enabled CarGiant departments and employees to seamlessly connect with each other. By upgrading its connectivity solution, CarGiant has increased the productivity of its workforce by allowing them to use a new Cloud IP phone system, which simplifies internal communication. In addition, the call centre team can now use key features such as reporting to make the team more efficient when handling inbound calls from customers. ■

The impact of AI on UC&C

Michael Tomkins, chief technology officer, IR

Whether you view AI as a boon to business, or a threat, AI has infiltrated almost everything we do in the business world today. AI is the future, not just a technology fad, and organizations are beginning to understand that if they don't accept it – they will fall behind.

Understanding AI in UC&C

Until now, communication has relied on email, SMS, social media, and other online services that provide us with information, messages, and ads. As we move further into the digital age, these methods are becoming more one-dimensional and less effective.

The key uses for AI in UC are to increase productivity and simplify processes. AI can relieve the burden of certain trivial tasks and allow teams to concentrate on more important responsibilities.

AI has already made its mark on communication with voice assistants like Siri and Alexa. With language processing capabilities, data contextualization, and the ability to offer deep insights into customer experience, AI is helping to rapidly improve communication.

2024: 25% growth expectations

With growth expectations of 25% by 2024, chatbots and virtual assistants are fast augmenting human involvement in customer service. They can provide instant responses to inquiries, and even navigate language barriers through translation services.

With its ability to analyze speech patterns, AI can help with customer satisfaction by detecting various emotions in a person's voice. It can also be invaluable in real-time translation for those with language communication difficulties.

Speech-to-text technology has evolved considerably over the years, as AI can process speech in real time, making it a powerful tool that increases productivity, for example, alleviating the need to take notes at meetings. Additionally, once speech is converted to text, it becomes searchable and shareable, adding another layer of business value.

AI can utilize facial recognition and biometrics for authentication for starting a meeting, accessing files, or entering meeting spaces. These methods increase efficiency and save time throughout the collaboration process by doing away with physical ID cards, passwords, or two-factor authentication.

Contextual AI

Context is an important foundational element of machine learning (ML). It's the key to making your AI rival that of a human. The incredibly intuitive nature of contextual AI enables systems to interpret information in the same way a human would. It enables AI systems such as chatbots and virtual assistants to have an actual human-like interpretation of language, audio, video, and images.

Contextual AI can analyze historical, situational, and cultural elements of data, and use that context to determine the most suitable outcome for the end user.

AI and the IoT

IoT can connect objects to the internet via embedded devices, meaning that seamless communication is possible between people, processes, and things. It can capture a massive amount of data from multiple sources. However, all this data from countless numbers of IoT devices, makes it complex to collect, process, and analyze.

Combining AI and IoT is redefining the way industries, organizations and even economies, function. This amalgamation creates intelligent machines that simulate smart behaviour, offer creativity, and unlock responses, with little or no human interference. While IoT deals with devices interacting using the internet, AI makes the devices learn from their data and experience, providing the perfect symbiosis of technology.

The future of AI and UC&C

There are some concerns and challenges with the use of AI in unified communications. Accuracy can be issue, as predictive machine learning models can give imperfect results. Job security, the constant improvements in conversational AI and the automation of tasks can be viewed as having a potential negative impact on the jobs of customer service professionals. Additionally, security could be at risk as the combination of AI and UC creates a greater area of compromise when using video, voice, text, and file sharing solutions.

However, with ever evolving and improving algorithms, the predictive capabilities of AI will be used in new and innovative ways to boost operational efficiency within the workplace. For example, being able to predict operational delays and pre-empt downtime, AI will have the ability to liaise with users to find the best solutions.

Organizations understand customer experience is of paramount importance, and as such, are constantly seeking ways to improve how to use AI and machine learning to interact with consumers. Combining unified communications and AI means the development of smarter chatbots, improvements in personalization for customers, and therefore an increase in customer retention for businesses.

AI is continuing to evolve day by day, and its power to change the way we work, communicate, and collaborate is increasing. The benefits, besides greater efficiency in the workplace, are that AI can free up employees to be more creative and productive by removing the drudgery of routine tasks. It can help alleviate the stress of bad customer interactions. And it can simplify the mammoth task of collating, analyzing, and processing complex data to help organizations achieve their business objectives. ■

Secure storage – what does the enterprise need to know about data compliance?

John Michael, CEO, iStorage

The path to data compliance is laid out clearly for the enterprise. The laws, rules and regulations surrounding the proper possession, organisation and storage of digital assets make organisations' responsibilities clear. They explain the data that needs to be protected and outline the processes which can make that happen.

But every business is unique. Each has taken a different route through its digital transformation process, been derailed in a different way by the unique requirements of the pandemic and places its own internal requirements on data use and storage, making the path to data compliance a little less clear.

Meeting compliance goals is a true test of internal governance and organisational acumen. Compliance demands that the policies surrounding data storage are comprehensive and properly followed, and that businesses apply hardware solutions to ensure compromised devices do not lead to a data breach.

The new NIS 2 normal

The revised Network and Information Security Directive (NIS 2) is perhaps today's largest compliance challenge. It expands the scope of the original NIS Directive to improve EU organisations' level of cybersecurity risk management and increases their reporting obligations, while also allowing EU states the option to add additional certification requirements on hardware and software used in the enterprise. NIS 2 also extends its reach, applying its regulation to numerous new sectors and imposing a varying level of regulatory oversight dependent on whether a business is in a sector deemed to be 'essential' or 'important.'

Though the UK government has announced that it will not implement NIS 2 directly, it has opted to strengthen the NIS regulations inherited from its time in the EU. This means that UK businesses must navigate a compliance path which is mindful of the complexities of NIS 2 when doing business with any EU state, must also meet the UK's particular version of NIS regulations, and face significant fines if they do not build a hardware, software, and cultural base of security and compliance.

Securing data's perimeter

Improving cybersecurity to comply with NIS 2 essentially means protecting all possible points of entry that could be used by an attacker. NIS 2 specifically requires organisations to consider not only their own vulnerabilities, but those of their suppliers and service providers – including data storage providers. Cloud providers have been quick to promote their security credibility, yet the terms and conditions of many major cloud entities include a 'limitations of liability' clause which puts the responsibility for data security squarely on the shoulders of the cloud user.

In many cases, we also put that responsibility in the hands of employees, since the rise of hybrid working means sensitive data is now regularly carried outside of company walls. The truth is that away from the scrutiny of IT teams the data hygiene of remote employees can slip. They may be tempted to use personal devices for work purposes, negating the protections of certified hardware. They may work on unsecured networks, in places where onlookers could steal passwords or view sensitive data, or they may lose critical documents if an unencrypted device is lost or stolen. Employees must, therefore, be educated as to their role in ensuring compliance, and be given the tools and devices to help them play their part.

The importance of encryption

The demand of managing every one of these aspects makes compliance a herculean task for IT teams – and they may falter. To maximise protection, securely encrypting files both in transit and at rest must be a core tenet of any plan. Properly encrypted files protect against compliance failure if liability is passed down the chain in the case of a cloud storage breach. Secure remote storage – ideally USB drives which include on-device AES-XTS 256-bit encryption and secondary authentication – can protect both against brute force attacks and against individuals with insufficient or expired access rights. Making regular backups and trusting them to hardware which can absolutely keep them safe is imperative.

256-bit AES hardware encryption, put simply, cannot be broken. It is the only way to guarantee the integrity of data and prevent falling foul of the ever-tightening rules and regulations surrounding cybersecurity risks. Encryption does not replace due diligence – vendors must still be carefully selected on their security credentials, particularly given the potential for EU states to impose their own rules on hardware use – but when used properly it offers security by default and safer data. ■

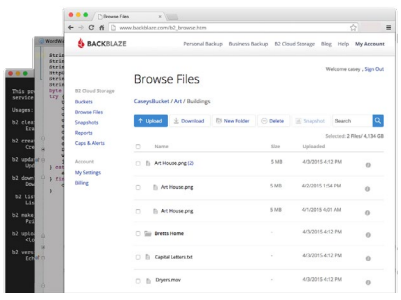
PRODUCTS

Backblaze B2 Cloud Storage, an infrastructure-as-a-service (IaaS) solution, enables the enterprise to build applications and run services with S3 Compatible APIs, SDKs, and CLI, with connected Compute and CDN.

Set up takes minutes, and the solution is easily scalable with single-tier storage pricing that's a fraction the cost of AWS S3 and free egress up to 3X of data storied. Data can be stored at US or EU data centres for redundancy, availability, and optional cloud replication.

The enterprise can be safeguarded with reliable data backup for Veeam, servers, NAS, and workstations. Indeed, B2 Cloud Storage integrates with top backup software and comes with features like Object Lock, advanced encryption options, and centralised management.

Users can advance and share content within existing workflows and preferred media management tools. Files are instantly accessible - no nearline, offline, or tape delays.



Dropbox Business is a secure, controlled enterprise platform, keeping company data, users, and devices safe, even if the team is distributed. The platform enables seamless integration with existing workflows, offering a simplified viewing experience, the ability to work collaboratively, from anywhere, and flexible workflows across local and cloud files.

Dropbox is designed with multiple layers of protection, including secure data transfer, encryption, network configuration, and application-level controls distributed across a scalable, secure infrastructure. Distributing encrypted files logically and spreading other data across multiple services not only makes syncing faster and more reliable, but also enhances security.

Dropbox Business can be customised for each enterprise's needs. The admin console empowers administrators with control and visibility features and provides tools for users to protect their accounts across various user interfaces. The Dropbox Business API also allows for partner product integrations with core IT processes.

Security, confidentiality, integrity, and availability are constantly under assessment and improvement. Dropbox regularly reviews and update security policies; provides employees with security training; performs application and network security testing (including penetration testing); conducts risk assessments; and monitors compliance with security policies.

Nextcloud Enterprise is pre-configured, optimised and hardened for the special needs of large scale, production-critical enterprise deployments. It comes backed by a Nextcloud Subscription which delivers access to Nextcloud's expertise, partner services and more.

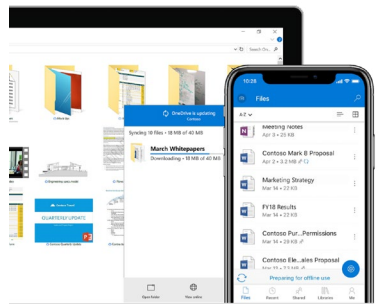
The solution aligns with industry standards like Clause 14 of ISO/IEC27001-2013 and related standards, guidance, and security principles. Nextcloud was built around combined assurance layers consisting of rich security features, applied best practices governed by policy and the design itself validated by industry standard testing processes.

Nextcloud leverages existing data storage and database technologies so current security policies and governance processes can continue to be used to manage, control and secure operations with Nextcloud. As such, the enterprise's IT department is fully in control.

Data can be accessed anywhere through existing storage silos like FTP, Windows Network Drives, SharePoint, and Samba shares seamlessly through Nextcloud.

Microsoft OneDrive connects all files across Microsoft 365, enabling collaborators to access and protect business data from anywhere, on any device, intelligently.

With a cohesive file experience, businesses can easily add shared files from Teams or SharePoint to OneDrive, upload files up to 100Gb, sync libraries, and more. Offline file edits are automatically synchronised when connectivity resumes. New integrations allow the creation of sharable links, granting expiring access, and following configured policies.



With OneDrive, enhanced admin capabilities with sync reports, sensitivity labels, and managed migration are enabled. Files can be shared securely in real time using Word, Excel, and PowerPoint across web, mobile, and desktop. Additionally, files can be edited and shared while on the move with the OneDrive mobile app. In case of accidental deletion or malicious attacks, files can be easily recovered; administrators can manage security policies to keep data safe.

Nordcloud's Cloud Migration in a Box is a package deal specially designed to reduce risks and speed up value for enterprise.

The business mitigates financial risk because there are minimal upfront costs (if any) – instead it's spread out and incorporated into the monthly opex for managed services and capacity. This means that the user gets value faster, because managed services cloud engineers work alongside cloud advisers and migration experts throughout the process, meaning there's less of a transition period. Workloads and applications are managed as they're migrated, delivering ongoing savings recommendations – so the business can quickly take advantage of the benefits.

The Cloud Migration in a Box solution offers lower capacity costs through real-time spend visibility and savings recommendations, enabling efficient budget management. Migrated workloads go directly into fully secure 24/7 management with the same Nordcloud team. Support, optimisation, and innovation cycles begin earlier in the migration lifecycle.

Please meet...

John Diamond, senior solutions architect, product, Park Place Technologies

Which law would you most like to change?

The Blue Laws … these are antiquated laws in parts of the US, including in the county where I live, that prevent useful shops such as DIY stores opening on Sundays. I've been to a food store on a Sunday morning where the aisle containing the rice cookers and kettles was cordoned off until noon. Can you imagine the frustration when you need another pipe joint halfway through mending a kitchen sink and have to drive to a neighbouring county to find an open hardware store on a Sunday afternoon?

What was your big career break?

I started my career working for a computer subsystems manufacturer which is where I also got my opportunity to move from the UK to the US. I then took an opportunity to move from a development role to a customer facing technical sales position at a different company and this was also when I started with network management, and I've never looked back. I find it rewarding to see how your actions can directly help customers improve their working lives and business productivity.

What did you want to be when you were growing up?

I had to take public transport to get to my high school in the UK and there was a time when I wanted to be a double decker bus driver. By the time I needed to look for a career, these dreams had been replaced by an interest in electronics and computing which lead directly to the world of software which is where I've happily continued for the last 30 years.

If you could dine with any famous person, past or present, who would you choose?

Having been instrumental in the introduction of web accessibility into the world of network management, I'd cherish the opportunity of talking to Tim Berners-Lee. His work at CERN to connect information repositories with the users that needed it in a way that related documents could be arbitrarily linked, opened up the previously arcane subject of information science to a world of users that didn't even know what they'd been missing out on before.

What's the best piece of advice you've been given?

If you don't like the tone of an email or feel someone is being disrespectful or unreasonable in their communications, pick up the phone and have a chat to them … nine times out of ten it's a misunderstanding, especially if there's a cultural difference. These differences are especially subtle between the US and UK and can easily be overlooked. There's so much truth in the statement that these two countries are divided by a common language.

The Rolling Stones or the Beatles?

The Beatles, without hesitation. When songs can be played on a piano without a stage, band, amplifiers and theatrics and it still gives you goosebumps you know you're dealing with truly magnificent musical creations. I remember taking my family to a Beatles exhibition in Montreal, Canada where we found a piano sitting in the street outside. My younger daughter, a teenager at the time, regaled us with a rendition of Eleanor Rigby and a passing kindergarten class stopped and applauded when the performance came to an end.

If you had to work in a different industry, which would you choose?

Wooden boat building. "Believe me, my young friend, there is nothing - absolutely nothing - half so much worth doing as simply messing about in boats," said the Rat in Kenneth Grahame's Wind in the Willows and I couldn't agree more. Mixing two of my lifelong interests, woodwork and boating would be a dream come true.

What's the greatest technological advancement in your lifetime?

I think it would have to be the internet. I thought about nominating microcomputing, high speed networking, data storage, display technologies and other crucial developments that underpin our modern lives, but the internet is what brings these all together to give a result that exceeds the sum of the individual contributors.

What would you do with £1 million?

I'd buy a canal boat and a canal side property with a mooring in the UK. The biggest challenge could be that it might be a tall order for £1 million. My wife and I love pottering about on the British canal network where the earliest days of the industrial revolution are still evident in the 250-year-old technology which is still being used today. ■