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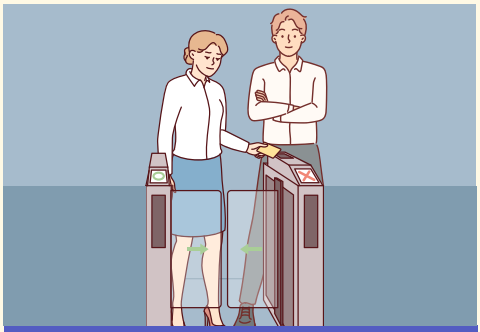

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EDITOR
Rob Shepherd
07708 972170

SUB-EDITOR
Chris Marsland

ADVERTISING MANAGER
Kate Paxton
01603 610265

CREATIVE DIRECTOR
Vishnu Joory

TECHNOLOGY CONSULTANT
James Abrahams

CIRCULATION MANAGER
Debbie King

ACCOUNTS
Billy Gallop

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Data centres are under tremendous pressure to deal with the energy demands placed on them by artificial intelligence (AI), while also lowering their carbon emissions. Given that one creates the other, it's quite a conundrum.

Small modular reactors (SMRs) have therefore come on to the radar as a promising solution for powering data centres, addressing escalating energy demands and the environmental concerns associated with these facilities. The supposed benefits are numerous – they can provide a reliable, continuous power supply for maintaining operations without interruptions. Additionally, they emit no greenhouse gases during operation, aligning with the growing emphasis on sustainability, while their scalability allows them to meet increasing energy demands as data centres expand.

However, SMRs are unlikely to be available for up to 10 years, while regulatory requirements and construction will be tightly controlled. Add to that the obstacles of fuel availability and the inevitable public objections and it could be that SMRs are not the answer to providing data centres with the low-carbon energy that some are suggesting. To explore this subject further we have assembled a panel of industry experts to discuss the pros and cons of SMRs.

In this month's issue we have a special feature dedicated to micro-modular data centres. Steven Carlini of Schneider Electric explains how micro-modular data centres are meeting the sustainability and energy challenges posed by the edge, while Chris Wellfair of Secure IT Environments outlines the practicalities involved in making them a reality.

We also have a special feature dedicated to security and access control, comprising two excellent articles. In the first, Francesco Bellavia of Mayflex outlines the benefits of cloud security solutions. He is followed by our old friend Andy Hirst of Sudlows, who looks at the need for mission critical physical security in and around data centres.

It's been great fun putting together a review of the Inside_Networks 2024 Charity Golf Day, which raised almost £10,000 for Macmillan Cancer Support. I'd like to once again say a massive thank you to all those who participated, sponsored and provided raffle prizes. We'll be doing it all over again in 2025.

Rob Shepherd
Editor

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R&M

CIOs must prepare for the fourth industrial revolution

A study from Logicalis has shown that chief information officers (CIOs) are investing in artificial intelligence (AI) tools to ensure they position themselves front and centre in the world's fourth industrial revolution. It revealed that 85 per cent of CIOs are earmarking budgets solely for AI development and implementation.


Neil Eke

This needs to be a strategic objective for many senior leaders in 2024, as 87 per cent of CIOs reported a substantial demand for AI technology from across their organisations. However, 72 per cent said that they are apprehensive about the challenges of regulating AI use internally and 64 per cent of business leaders expressed worries about AI threatening their core business propositions.

Neil Eke, CEO at Logicalis UK&I, said, 'Compared to our 2017 report when CIOs were mainly focused on keeping the lights on, their remit in 2024 is far more strategic, forward thinking and business driven. Digital transformation is being replaced with AI innovation as more investment goes towards emerging technologies.'

Cyber board level representation surges amid intensified regional conflicts, cyberattacks and AI driven threats

Board level representation for cybersecurity surged 55 per cent in the last 12 months within the UK's critical national infrastructure (CNI) organisations. The figures are revealed in research from Bridewell, which surveyed 521 staff responsible for cybersecurity at UK CNI organisations.


Anthony Young

Across all CNI sectors, 29 per cent of organisations now have a chief information security officer (CISO) or person with cybersecurity responsibilities on their board of directors, compared with 19 per cent last year. More than a quarter (27 per cent) of organisations are currently bringing in such changes and 19 per cent plan to within the next 12 months.

Anthony Young, CEO at Bridewell, said, 'As CNI organisations grapple with a challenging and changing environment, it is very welcome to see such a significant increase in board members with responsibility for cybersecurity. Even if the overall level is still too low and a greater sense of urgency is required, the signs are there that cybersecurity is getting the recognition it needs at the top table.'

95 per cent of IT leaders say stress impacts their staff retention

95 per cent of IT leaders in the UK and Ireland say stress impacts their staff retention. This is exacerbating the talent shortage within the industry, with 41 per cent of businesses citing a lack of skilled personnel as the main challenge in managing and responding to cyberthreats, according to SenseOn.

When looking to adopt new cybersecurity solutions, 42 per cent of businesses say 'ease of implementation' is one of their top considerations. However, the findings also highlight that the implementation of new technology takes on average up to six months, with a further six months spent on training, increasing the burden on teams that are already under significant pressure. Therefore, rather than helping to reduce the stress being faced by cybersecurity professionals, this may be adding to the problem.


David Atkinson

David Atkinson, CEO at SenseOn, commented, 'Too often, organisations buy new cybersecurity solutions as a kneejerk reaction to issues like growing cyberthreats or stress among their IT teams. But they're not thinking about the value they will provide in both the short- and long-term, and the broader implications.'

nLighten introduces Integrated CFE Score to measure and report on the full carbon free energy usage of its edge data centres

nLighten has introduced an extension to the already established Carbon Free Energy (CFE) metric. The new indicator measures the percentage of carbon free energy supplied and consumed on an hourly basis to assist with the inclusion of heat recovery in energy reporting.

nLighten worked in collaboration with the Fondazione Eni Enrico Mattei (FEEM), an international research centre for the study of energy and environmental issues, based in Milan. This approach extends analysis to include both carbon free electricity and heat produced by nLighten data centres. It then integrates waste heat recovery into sustainability metrics that extend beyond the data centre perimeter to encompass coupled buildings or systems. With this initiative, nLighten aims to provide a transparent measurement of environmental impact and contribution to decarbonisation efforts.


Chad McCarthy

Chad McCarthy, chief technology officer at nLighten, said, 'The integrated CFE Score considers all the components of nLighten sector coupling – heat reuse, grid stabilisation, on-site generation and power purchase agreements. By integrating all these components, we create a metric to measure the improvement in efficiency and emissions that our data centres make within the community infrastructure.'

Driving digital transformation is top of the agenda for FTTH Council Europe

The FTTH Council Europe has elected a new president, treasurer and board of directors. Advancing full fibre network deployment and adoption, while successfully migrating customers from outdated copper connections, are some of the key action items facing the organisation.


Roshene McCool

Roshene McCool takes over from outgoing president, Raf Meersman, and will begin a one-year term at the head of the organisation. In her new role, she will support the board of directors and working group to ensure Europe has an optimal regulatory environment. With FTTH Council Europe's support, this environment can deliver the objectives of the Digital Decade and foster the digital transformation of all European economies.

'The current regulatory framework has been very effective in incentivising investment in fibre in Europe, but improvements can always be made,' McCool said. 'Our focus will be on our four key objectives – facilitating the deployment of fibre networks, increasing incentives to invest in the sector, maintaining a competitive environment and supporting a green transition from copper to fibre.'

Equinix calls for more organisations to join the Equinix Heat Export programme

Equinix is calling for municipal planning agencies, energy utilities and heat network operators around the world to join the Equinix Heat Export programme to unlock the value of the residual heat generated in its International Business Exchange (IBX) data centres.


Gary Aitkenhead

Equinix will export heat in its newest IBX in Paris, PA10, and transfer it to the Plaine Saulnier urban development zone and the Olympic Aquatic Centre, which will host several events during the 2024 Summer Olympics. Heat exported from TR5, one of Equinix's IBX data centres in Toronto, is distributed throughout multiple residential buildings, as well as a nearby hotel, university and local shopping centre in downtown Markham. TR5 also services multiple buildings with domestic hot water all year long, thanks to the heat network of Equinix's energy partner, Markham District Energy.

'Our Heat Export programme is one important way data centres can give back to their local communities,' explained Gary Aitkenhead, SVP EMEA IBX operations at Equinix. 'So, we are asking for more partners to join the programme and reuse the heat from our operations for the good of people and our planet.'

62 per cent of business leaders are willing to sidestep ethical and security concerns to keep up with AI

62 per cent of business leaders said moving too slowly poses a greater risk than moving swiftly when it comes to tech innovation, claiming they were willing to sidestep security and ethical concerns to keep up, according to research by AND Digital that surveyed 600 global CEOs. The fear of falling behind technology innovation is a major driver, with 55 per cent of respondents revealing the pace at which new technologies are emerging is causing alarm among senior leadership teams.


Lisa Talia Moretti

A further 64 per cent of CEOs said they are happy to invest in new technologies without a clear return on investment to keep up with the pace, which leaves businesses vulnerable to data leakages, errors and delays. The rapid global development of artificial intelligence (AI) further adds to this concern, with 44 per cent of CEOs polled revealing they feel their staff aren't ready to handle AI adoption.

Lisa Talia Moretti, user research principal and digital sociologist at AND Digital, commented, 'It is both disappointing and concerning to see business leaders prioritising speed over safety, security and ethics. We live in a world facing an increasing number of complex problems and continuing to implement a reckless experimentation strategy of "move fast and break things" is dangerous. We have broken enough things.'

NEWS IN BRIEF

Vantage Data Centers has completed a $9.2bn equity investment managed by DigitalBridge Group.

Schneider Electric has partnered with DC Smarter to integrate its digital twin software, DC Vision, within Schneider Electric's EcoStruxure IT Advisor data centre infrastructure management (DCIM) platform.

NTT Data and Zebra Technologies have formed a strategic partnership to drive innovation in the 5G device ecosystem, transforming industries such as automotive, manufacturing, healthcare and logistics with next generation connectivity.

UfiSpace has opened an OCP Experience Center in Taipei.

Digital apprentice numbers grew by 50 per cent last year but smaller UK organisations are held back from hiring more because of bureaucracy and funding challenges, according to a report by BCS, The Chartered Institute for IT.

IQM Quantum Computers has opened its first quantum data centre in Munich.

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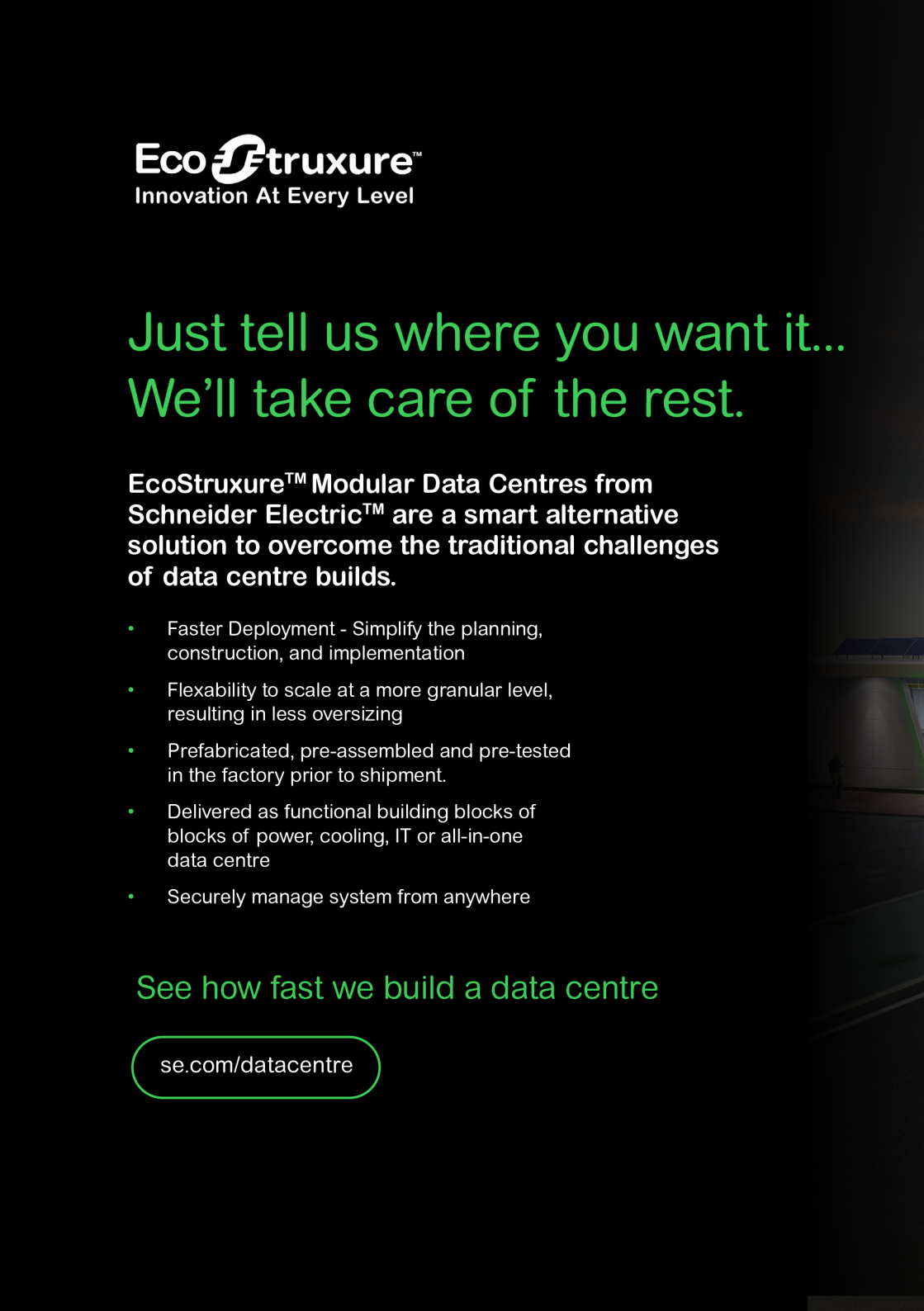

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The consequences of failing to buil

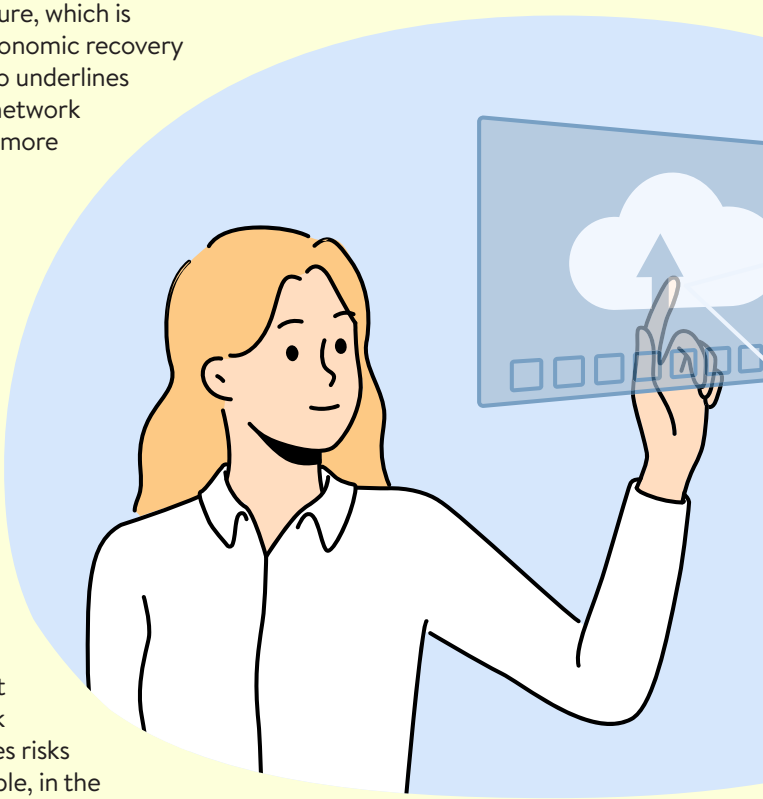
Hi Rob

Recent figures from Vorboss have shown that the UK economy lost a staggering £17.6bn due to fixed connectivity outages over the last 12 months, with nearly one-fifth of businesses experiencing at least three outages in the past year. This data reveals a critical vulnerability in our national infrastructure, which is significantly impacting economic recovery and growth. Equally, it also underlines that the need for robust network resilience has never been more pressing.

The consequences of downtime on businesses are far-reaching. Connectivity outages disrupt business operations, leading to substantial financial losses and reputational damage, often accompanied by a drop in productivity, decreased customer satisfaction and higher employee turnover.

Any industry dependent on uninterrupted network access for operations faces risks on a daily basis. For example, in the retail sector, which heavily relies on point of sale (PoS) systems for credit card transactions, an outage can bring sales to a halt, frustrate customers and erode trust.

To mitigate the impact of fixed connectivity outages, businesses are turning to innovative network technologies that enhance resilience. One such solution is smart out of band (OOB) management, which provides a secondary path for accessing and managing network devices, even when the primary network is down. This technology ensures continuous operation by allowing IT staff to diagnose and resolve issues remotely, reducing mean time to repair (MTTR).

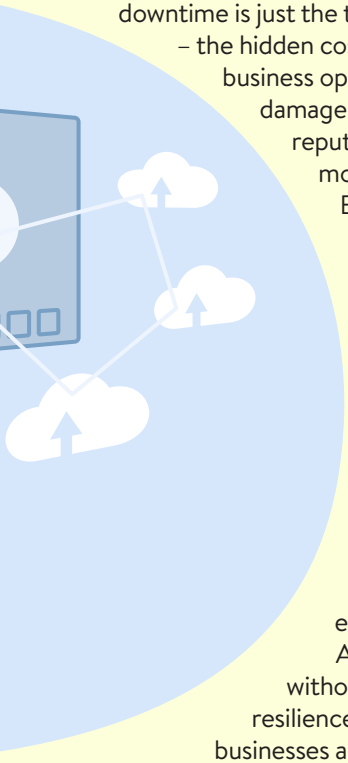


Moreover, integrating cellular failover solutions into the network infrastructure can maintain critical functions during an outage. Solutions that combine OOB management with 4G LTE failover offer a reliable back-up connection that keeps

d resilience into business networks

essential services running. Sticking with the retail example, this means PoS systems can continue processing transactions, minimising disruption and maintaining customer satisfaction.

Failing to build more resilience into business networks can have severe long-term consequences. The immediate cost of downtime is just the tip of the iceberg – the hidden costs, such as lost business opportunities and damage to a company's reputation, can be far more detrimental. Businesses perceived as unreliable due to frequent outages may find it challenging to retain customers and attract new ones, impacting their competitive edge.



Additionally, without robust network resilience strategies, businesses are at higher risk of extended outages, which can lead to operational setbacks. For example, a prolonged inability to access cloud-based applications and data can cripple business functions, delaying project timelines and reducing overall productivity. The financial implications of such disruptions can accumulate rapidly, affecting the bottom line and hindering growth.

As the UK grapples with these connectivity challenges, it is imperative for businesses to take proactive measures to safeguard their operations. Investing in advanced network management tools and technologies is not just a cost but a strategic necessity. By ensuring that networks remain operational during outages, businesses can protect themselves against the immediate and long-term impacts of connectivity failures.

Solutions that provide true OOB management and cellular failover capabilities help reduce downtime, maintain business continuity and protect against the financial and reputational costs associated with network outages. These strategies exemplify the type of resilience building approaches that can help businesses navigate connectivity challenges. By embracing technologies that enhance network resilience, businesses can mitigate the impact of fixed connectivity outages and safeguard their operations against future disruptions.

Alan Kinsey
Opengear

Editor's comment

Some companies have a surprisingly blasé attitude towards their business network resilience and, quite frankly, aren't taking the issue, and its implications, seriously enough. As Alan states, the consequences of downtime can be significant and while eliminating it entirely is perhaps unlikely, there are certainly tools and strategies that can reduce it.

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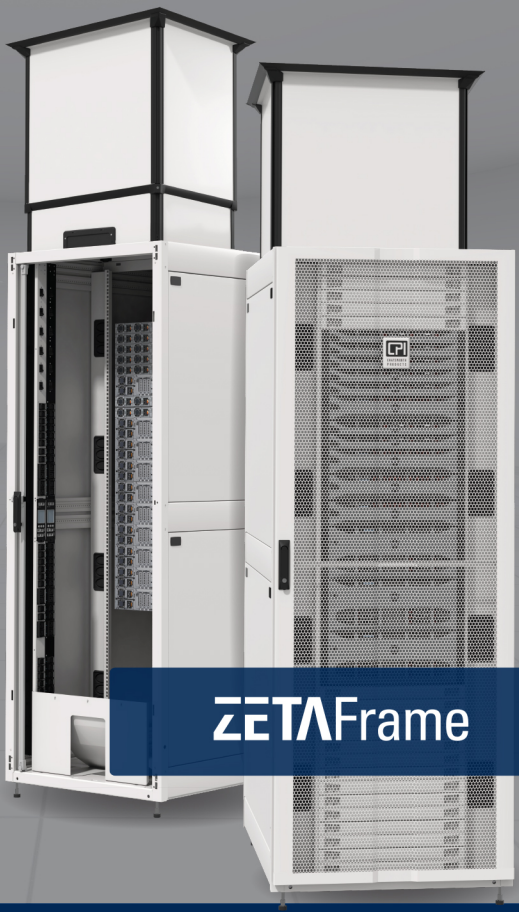

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Chain reaction

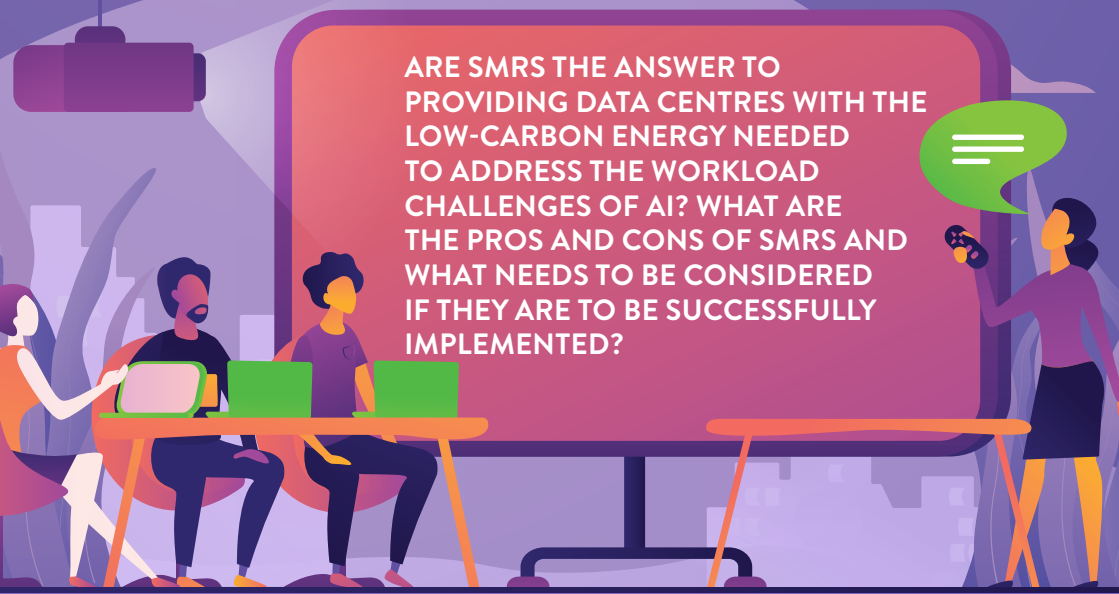
Small modular reactors (SMRs) are increasingly touted as a way to deal with the energy demands placed on data centres by artificial intelligence (AI). Inside_Networks has assembled a panel of industry experts to examine their feasibility, as well as their advantages and disadvantages

The data centre sector is facing two significant energy related obstacles as it strives to expand capacity to meet the growing demand placed on it by AI. The first is the scarcity of accessible energy and the second is the growing regulatory requirement to reduce carbon emissions. It's why there is growing interest in SMRs and their potential to address both concerns simultaneously.

An SMR is a type of nuclear reactor that is designed to be compact, scalable and modular. Generally, SMRs are designed to produce anywhere from a few MW to a few hundred MW of electrical power and offer advantages such as enhanced safety features, more flexible deployment options and potentially lower construction costs. SMRs are seen as a promising technology for providing data centres with clean and reliable energy, particularly in areas with limited space.

Although nuclear power is a clean energy source that can complement renewable energy, aiding data centres in achieving greater sustainability, few think SMRs are likely to be available for up to 10 years. With AI growing, and growing fast, SMR technology will have to be available sooner rather than later.

Inside_Networks has asked a panel of experts to examine the potential of SMRs as a way to meet the demand for low-carbon energy in data centres and the obstacles faced in implementing them.



CARRIE GOETZ

PRINCIPAL AND CHIEF TECHNOLOGY OFFICER AT STRATEGITCOM

Power is indeed the word of the day. Where is it? How do I get more? How much will I need? You name it, there is a conversation around power driven by newer power-hungry applications.

Microgrids are an excellent way to power a facility. Microgrids can alleviate grid strain and, in some cases, supply the grid when not operating in autonomous mode. Renewables have received the lion's share of the microgrid focus, with options for hydro, solar and wind. Even carbon captured and carbon sequestered natural gas comes into play.

While nuclear offers a great option, nuclear plants are likely 10 years out due to regulatory requirements and construction – at best. Renewables are not all grid connected yet, and some projects have been cancelled or put on hold due to wildlife and environmental impacts. There is no power source without some sort of problem or waste by-product, however, we are getting better at mitigating harm. Filtration has matured, while emissions are controlled (at least in some countries).

Delivering power while minimising losses is key. Transmission losses are a great example. On-site generation will supply more power to a facility by removing the miles of transmission cables contributing to the losses. However, to be microgrid dependent, adequate power sources must be available. Waste, mainly toxic waste, is increasingly alarming. Landfills, technical graves and recyclability may influence decisions.

Carbon capture and carbon sequestration offer great promise. Industries like agriculture buy CO_2 by the truckload to benefit plants. We are at the early stages of understanding the best outcomes for carbon manipulation but there is great promise surrounding hydrogen and natural gas production.

Assuming one decides on a microgrid, what is the best kind? What capacity should one plan for if, as in the case of nuclear, when we know power won't be live for 10 years? It will likely take all forms of energy.

However, I would question why we aren't teaching consumers of technology to be better environmental power stewards. Does one really need to send things to everyone? Laugh often, but remember, you are part of the carbon problem.

'I WOULD QUESTION WHY WE AREN'T TEACHING CONSUMERS OF TECHNOLOGY TO BE BETTER ENVIRONMENTAL POWER STEWARDS. DOES ONE REALLY NEED TO SEND THINGS TO EVERYONE? LAUGH OFTEN, BUT REMEMBER, YOU ARE PART OF THE CARBON PROBLEM.'

MARK ACTON
HEAD OF TECHNICAL DUE DILIGENCE AT FUTURE-TECH

Using nuclear power for data centres to satisfy baseload grid demand alongside renewable energy sources seems like an obvious choice. This is especially the case considering power supply constraints and the negative media attention currently faced by data centre sector power consumption.

The size and capacity of SMRs seems particularly suited to large data centres and data centre campus applications, as their capacity ranges from 20MWe at the lower end of the scale up to around 300MWe at the upper end. Designs from various manufacturers differ on this range and those at the lower end of the scale are often referred to as micro nuclear reactors.

In principle, these units use tried, tested and safe technologies based on nuclear submarine engines with considerable amounts of run hours, although updated designs and technologies are being considered by the likes of Rolls-Royce, which already manufactures these engines. Despite the promise of abundant stable power with very low CO2 output, there are clearly issues remaining. These include:

- Public and media concern over the use of nuclear power and the inevitable intervention of environmental pressure groups.
- A resolution of the ongoing debate about nuclear being truly sustainable.
- The hardened security required for nuclear installations.
- The extended testing and certification periods for designs for new applications.
- Availability of suitable fuels, as some designs will require new fuel mixes.
- Disposal of waste.

Even with these issues resolved there remains the need for a demonstration of clear commercial benefit to operators considering using nuclear options. Last Energy is claiming to be able to produce units offering 20MWe of power at a cost of $100m each, however, the fuelling cycle and operating lifetime will become key issues. Some are even claiming costs as low as $3,000 per kW, with potentially more realistic numbers being in the order of $6,000 per kW. The true costs are yet to be established.

Finally, will SMRs and nuclear power generally be used to satisfy data centre and general grid demand? Yes. When that will happen and when the issues noted above will be resolved to allow adoption remains uncertain.

‘THE SIZE AND CAPACITY OF SMRS SEEMS PARTICULARLY SUITED TO LARGE DATA CENTRES AND DATA CENTRE CAMPUS APPLICATIONS, AS THEIR CAPACITY RANGES FROM 20MWE AT THE LOWER END OF THE SCALE UP TO AROUND 300MWE AT THE UPPER END.’

JOHN BOOTH
MANAGING DIRECTOR AT CARBON3IT

Are SMRs the answer to providing data centres with low-carbon energy? No, and for multiple reasons.

The first one is cost. We simply do not know how much an SMR will cost and, judging by real life nuclear projects, whatever price is set at the beginning will overrun considerably by the end. For example, Hinkley Point C was granted final approval in 2016 at a cost of £18bn and it was claimed that it would be generating by 2025. The most recent update in January suggested that the cost will now be in the region of between £31-34bn and it won't generating electricity until 2029.

The second is location. Many cities have nuclear free zones, which prohibits both nuclear weapons and nuclear power plants. Thirdly, to allow for maintenance, you'll need two SMRs on-site. Fourthly is access to fuel. You'll not be able to pop down to the shops to buy fuel, it is quite rightly a highly regulated substance.

The fifth reason is security. We are dealing with a highly regulated material that will require a considerable enhancement of security measures on-site. The sixth is timescales, as even the most accelerated SMR project will not be generating electricity until, realistically, the mid-2030s.

The seventh is regulation. Up until quite recently the data centre sector enjoyed a relatively benign regulatory environment. We mostly got caught under legislation designed for power plants. Do you see where I'm going here? Now, of course, our European cousins are facing a raft of environment legislation specifically targeted directly at data centres – the Taxonomy Climate Delegated Act (TCDA), the Corporate Sustainability Reporting Directive (CSRD) and the Energy Efficiency Directive (EED) – and it is highly likely that similar legislation will be introduced in the UK that will closely align.

Data centre operators have been whining about these regulations, but I can tell you that the regulatory regime for nuclear power stations is on another level. In effect, those operating them will become a utility and they are heavily regulated. The whining will reach fever pitch.

All that said, we do see a need and a desire for SMRs. However, they will not be exclusively powering data centres, but will be part of an overall energy strategy and located on existing or former power station sites.

'I CAN TELL YOU THAT THE REGULATORY REGIME FOR NUCLEAR POWER STATIONS IS ON ANOTHER LEVEL. IN EFFECT, THOSE OPERATING THEM WILL BECOME A UTILITY AND THEY ARE HEAVILY REGULATED. THE WHINING WILL REACH FEVER PITCH.'

TONY GRAYSON
GENERAL MANAGER AT COMPASS QUANTUM

SMRs are increasingly viewed as a promising clean energy solution for data centres. Yet, their widespread implementation faces significant delays, primarily due to regulatory challenges and the need for high-assay low-enriched uranium (HALEU). With HALEU requiring a unique production process and main suppliers currently unavailable, alternative sources are only now being explored. Consequently, it might take up to a decade before SMRs can be fully integrated into data centre operations.

In the meantime, the nuclear energy sector is not standing still. New ideas such as Holtec's revival of a decommissioned reactor in Michigan are noteworthy. Additionally, some companies are reconfiguring their reactors to produce less than 300MW, fitting the SMR category, and enhancing safety with passive cooling features that eliminate the need for pumps. These ideas greatly shorten the speed to market.

The appeal of SMRs lies in their compact and efficient design, which significantly eases planning constraints. Their deployment is limited to the plant's footprint, simplifying the approval processes and enabling just in time scaling by adding more units as needed. This flexibility could revolutionise how power is delivered to data centres.

However, the landscape of data centre energy solutions is also shifting due to the rise of generative AI. Technologies such as OpenAI, which are not sensitive to latency, allow for the placement of data centres in remote locations where power and land are more affordable. This is exemplified by Amazon Web Services' acquisition of the Cumulus data centre, strategically located to benefit from nuclear power.

While SMRs promise a future of clean and efficient energy for data centres, other alternatives are also emerging. Microreactors, for instance, are set to be deployed within this decade, offering a viable solution for smaller-scale operations like Nvidia's Grace Blackwell pods and superpods.

Although SMRs hold potential, the current focus in data centre development is on speed to market, which focuses on leveraging immediate nuclear innovations and adapting to the geographical flexibility afforded by advancements in AI technology. These developments herald a dynamic era for data centre energy management, balancing immediate needs with future possibilities.

'THE APPEAL OF SMRS LIES IN THEIR COMPACT AND EFFICIENT DESIGN, WHICH SIGNIFICANTLY EASES PLANNING CONSTRAINTS. THEIR DEPLOYMENT IS LIMITED TO THE PLANT'S FOOTPRINT, SIMPLIFYING THE APPROVAL PROCESSES AND ENABLING JUST IN TIME SCALING BY ADDING MORE UNITS AS NEEDED.'

EMMA FRYER

DIRECTOR OF PUBLIC POLICY EUROPE AT CYRUSONE

There is currently much discussion about the deployment of SMRs to power data centres. It is suggested that they will help bridge the widening gap between the projected energy demands of the sector and the energy available from antiquated electricity grids suffering from decades of underinvestment and well-intentioned, but misguided, policy intervention.

SMRs offer several obvious advantages – utility scale baseload power delivered continuously and reliably, in contrast to the intermittency that hampers most renewables, which therefore depend on additional balancing capacity. Nuclear power, while not renewable, has a very low-carbon footprint and can use multiple fuel sources, not just uranium.

SMRs do not rely on untested technology. Nuclear power generation is already widely deployed from large to micro scale and is governed by strict regulatory frameworks and demanding standards. Moreover, SMRs can potentially deliver energy that is competitively priced compared to the wholesale cost of power.

All this sounds very alluring, but adopting SMRs is unlikely to be plain sailing. On the negative side, public acceptability may be a significant challenge in view of the negative perception associated with major incidents in the past and the well-publicised problems of nuclear waste disposal. In terms of public policy, adapting the regulatory regime to accommodate this new type of deployment could take time.

On a more technical level, locations suitable for SMR may not align with data centre development zones, so rather than enabling direct connections, virtual or sleeved power purchase agreements might be needed. This, in turn, would take us back to our existing problem – expanding grid capacity fast enough to deliver power when and where it is required. Concerns have also been voiced about the very high temperature waste heat generated, which may pose a risk for those in close proximity.

From my perspective there is a more strategic consideration. We live in a world where energy supply disproportionately influences geopolitics. Therefore, I'd be very interested to know where the fuels for SMRs will be sourced and whether SMRs could free us from existing dependencies or create new, but equally problematic, ones.

'PUBLIC ACCEPTABILITY MAY BE A SIGNIFICANT CHALLENGE IN VIEW OF THE NEGATIVE PERCEPTION ASSOCIATED WITH MAJOR INCIDENTS IN THE PAST AND THE WELL-PUBLICISED PROBLEMS OF NUCLEAR WASTE DISPOSAL. IN TERMS OF PUBLIC POLICY, ADAPTING THE REGULATORY REGIME TO ACCOMMODATE THIS NEW TYPE OF DEPLOYMENT COULD TAKE TIME.'

STEPHEN BOWES-PHIPPS

VICE PRESIDENT EMEA DATA CENTRES AND CLOUD AT STATE STREET

In 2022 data centres used between 240TWh and 500TWh of electricity, which is roughly 1-2 per cent of that consumed worldwide. Hyperscalers used over 72TWh of electricity in 2021, more than double their usage in 2017. Meanwhile, data centre construction is still growing at a five-year compound annual growth rate (CAGR) of 11.3 per cent, with hyperscale data centres growing at 20 per cent CAGR. Colocation facilities are targeting the high demand rate of generative artificial intelligence (GenAI) as a way of expanding footprint and profit.

Governments are both encouraging data centres and reining them in as massive consumers of power that cause shortages for other industries and residents (voters!). Data centre providers, when seeking plots for large AI campuses, are facing having to invest in building out on-site generation, whether gas, nuclear or combined heat and power (CHP). This is least likely to provoke the ire of national governments and guarantees the power that AI data centres require.

Gas and CHP are counter to the move to net zero and are therefore controversial choices for sustainable on-site generation, which leaves nuclear as the only low-carbon option. Nuclear generation can be split into three levels of supply – large conventional reactors (LCR) delivering 700+MWe, SMRs delivering up to 300MWe and micro or very small nuclear reactors (MNR) delivering c10MWe.

LCRs are eye-wateringly expensive to build, with huge time and cost overruns, and significant local opposition to their siting. SMRs are still significant installations and are proving difficult to develop into a commercial offering.

No single data centre provider can afford the investment of such a power source on its own but many are now buying power purchase agreements (PPAs) in companies that are developing them – in the hope they will benefit in the future. MNRs can be shipped in ISO containers, recycle waste nuclear fuels and be managed and run by third parties, while also being compact enough to provide multiple redundant supplies. However, neither SMRs or MNRs are currently sufficiently commercialised and require regulation, support and encouragement from governments to succeed.

On-site generation may be the only realistic option for data centre providers moving forward, if Gen AI is their target market. Data centres demand reliable energy sources and nuclear is the only current low-carbon source to achieve that high benchmark.

'ON-SITE GENERATION MAY BE THE ONLY REALISTIC OPTION FOR DATA CENTRE PROVIDERS MOVING FORWARD, IF GEN AI IS THEIR TARGET MARKET.'

Keeping it real

Steven Carlini of Schneider Electric explains how micro-modular data centres are meeting the sustainability and energy challenges posed by the edge

Traditionally, to meet the growing demand for fast deployment of efficient, sustainable and scalable data centre capacity, a modular approach has been a popular and successful option. Preconfigured, pre-certified designs can be quickly produced, shipped and deployed with ease, and often with minimal specialist skills on-site.

AI DEMAND

This approach is seeing new value, as increasing demand for edge computing facilities brings compute power closer to the user and the data they generate. Added to this is the emerging demand for artificial intelligence (AI) at the edge, and micro-modular data centres are the answer to quickly building out capable capacity where it is needed. It also works first time, is scalable, efficient but, critically, sustainable.

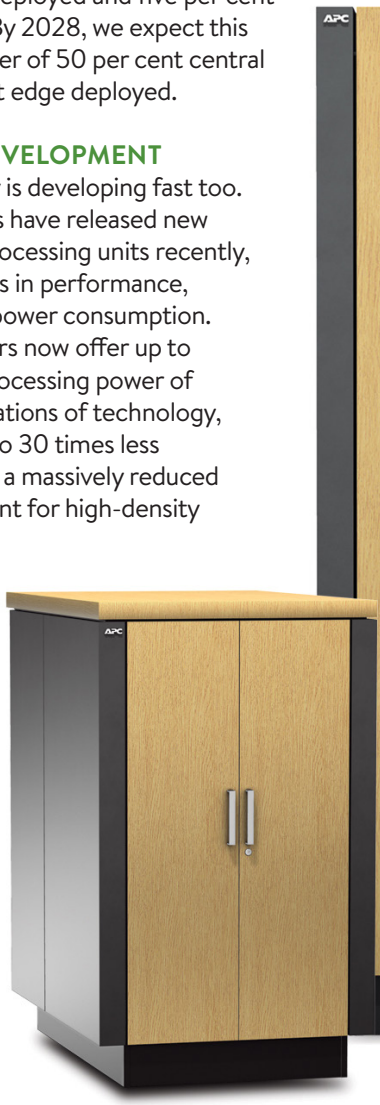
There is little doubt that AI demand is growing. Estimates from IDC indicate that in 2023 enterprises worldwide spent $166bn on AI solutions, covering software, hardware and services. However, the analyst has estimated growth of 27 per cent per year to $423bn by 2027.

From our own research, we estimate that in 2023 AI consumption was in the order of 4.5GW globally but will grow to between 14GW and 18.7GW by 2028. AI power consumption was eight per cent of total data centre power in 2023 but will grow to represent between 15-20 per cent in the same period. AI workloads were 95 per cent centrally deployed and five per cent edge in 2023. By 2028, we expect this to be in the order of 50 per cent central and 50 per cent edge deployed.

SPEED OF DEVELOPMENT

The technology is developing fast too. Several vendors have released new dedicated AI processing units recently, with major steps in performance, efficiency and power consumption. Some processors now offer up to 25 times the processing power of previous generations of technology, while using up to 30 times less power and with a massively reduced physical footprint for high-density deployments.

However, these



developments come with their own challenges in terms of power, cooling and rack space. We have done a lot of research in this area, identifying the specific needs of AI workloads and integrations for data centre owners and operators. Furthermore, we have worked with vendor partners to AI build reference designs that ensure reliability, efficiency and ease of deployment, further bolstering efforts to get the power of AI to more organisations, faster.

MANAGEMENT SYSTEMS

Data centre infrastructure management systems (DCIM) are critical. AI enhanced DCIM will play a greater role in managing and optimising deployments, with implications for capacity planning and siting.

Intelligence gathered from DCIM will allow more accurate information to be fed into design models to produce modular data centre building blocks that are rightsized, but scalable to meet future needs. This will include power management, including that of on-site renewable energy sources such as wind, solar or, in some cases, hydro, which with highly efficient operation reduces the burden on the local grid, potentially allowing for near self-sufficiency where required.

USE CASE DRIVEN

As with all great waves of technological adoption, edge AI is being driven by use cases. Various forms of industrial internet of things (IIoT), such as process automation, predictive maintenance, predictive analytics, active security monitoring such as video analysis, smart home automation, intelligent assistants and more, are

'Intelligence gathered from DCIM will allow more accurate information to fed into design models to produce modular data centre building blocks that are rightsized, but scalable to meet future needs.'

all driving the need for AI at the edge.

The benefits of AI at the edge are also clear. Reduced data transmission is a key benefit. By processing more data, more intelligently, closer to where it is produced, the overall data volume transmitted falls sharply. There are also benefits for lower latency of transmission over shorter distances, and often storage needs are also reduced.

REDUCED MODEL

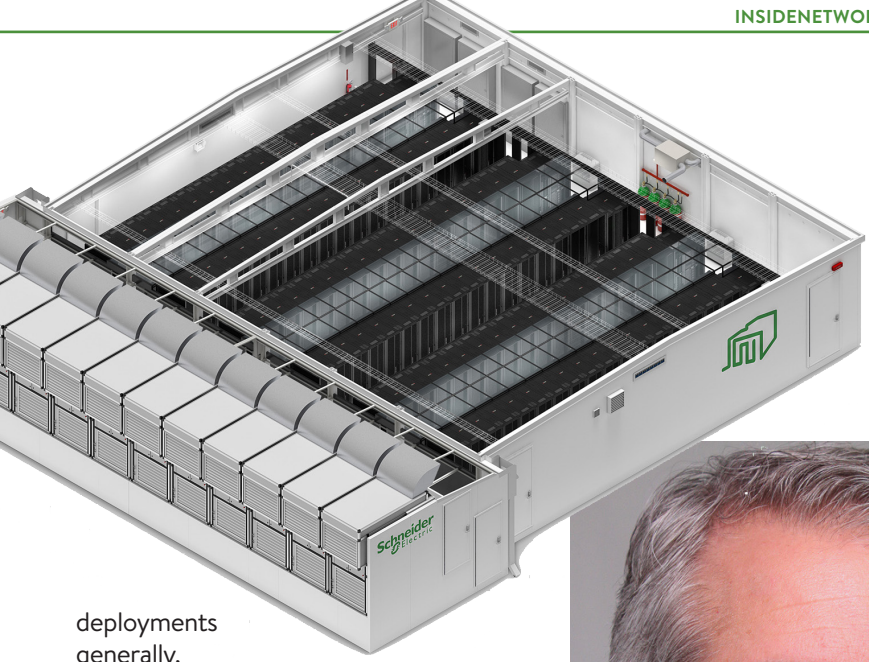
Edge AI also benefits from the reduced model principle. In some cases, AI servers can be dual purpose, as learning servers processing vast volumes of data to refine and optimise algorithms. This requires access to, and bandwidth for, large volumes of data to be processed. This is often done at off-peak times when demand for the AI service is low. When demand rises, these servers can be switched to inference mode, when the algorithm applies what it has learned and is accumulated to the workload at hand.

In edge AI applications, a reduced model can be deployed where the local, more specific application of an AI algorithm can be deployed in chiefly inference mode. This reduces the technology stack needed to perform its specific task, with the benefits of lower consumption, lower bandwidth needs and lower maintenance overheads. When appropriate, updated versions of the algorithm can be deployed, bringing the benefit of multiple edge deployments and their accumulated learning to each instance. Several vendors have been working on inference optimised AI hardware to meet these needs, with the benefits of reduced technology stacks outlined.

IN SMALL DOSES

From our estimates of up to 50 per cent edge AI deployment by 2028 compared to just five per cent up to now, we see more, smaller deployments, especially in urban areas, of the order of 1-10MW. In city applications there are likely to be clusters of these smaller, micro data centres that have, for example, cameras monitoring things in a mesh network. They would be part of industrial, municipal or even environment monitoring services. They will not share video feeds, or even pictures, but abstractions and inferences from the analysed video, as results or recommendations.

Reliability will be key for these edge



deployments generally, and particularly for edge AI. All critical power considerations must be made, even with relatively small deployments. This also brings sustainability considerations into play, ensuring efficiency and managing consumption to limit overall environmental impact. This can be a challenge, even in populated areas, or where human expertise may be thinly dispersed, or in limited availability.

SMART THINKING

The current generation of micro-modular data centres can produce standardised or bespoke solutions to meet even the most demanding of workloads, such as edge AI. This can be done with efficiency, reliability and sustainability built-in, through reference designs, best in class hardware and, with circularity as a key consideration, minimal environmental impact. With active monitoring through next generation DCIM enabling the leveraging of renewable energy sources, it further enhances operations to reduce environmental impact, while supporting reliability and self-sufficiency. ■

STEVEN CARLINI

Steven Carlini is vice president of innovation and data centre at Schneider Electric. He and his team focus on spearheading Schneider Electric's data centre, digital energy and residential businesses. In 2022 Carlini joined the Forbes Technology Council and he is a member of the World Economic Forum's 5G-Next Generation Networks Programme.

Siemon

Siemon provides a cutting-edge range of cabling and connectivity solutions. They are perfectly designed for environments that require management of a large number of physical connections in a smaller space.

Micro-modular data centres benefit from Siemon's high-performance Z-MAX Category 6A copper cabling with 10Gb/s data speeds. Meanwhile, Siemon's SkinnyPatch modular cords deliver superior performance with a reduced cable diameter for improved airflow and increased flexibility in high-density patching areas. Offering a significantly tighter bend radius for easier cable routing and enhanced cable management, these cords provide extra pathway space savings in racks and cabinets.

For short distance connections from servers to switches and other IT equipment within the rack, Siemon's high-speed interconnect solutions provide a viable option. Direct attach copper cables (DAC) or active optical cables (AOC) support transmission speeds from 10Gb/s to 100Gb/s and are available in different lengths to avoid cable slack inside the rack for improved cable management and better airflow.

To find out more **CLICK HERE.**
www.siemon.com

Portus Data Centers

Portus Data Centers was formed in 2023 with the acquisition of European Data Hub (EDH) in Luxembourg and a modern Tier IV data centre in Munich. Portus has since acquired IPHH in Hamburg, which has added two more data centres to the current portfolio.

As part of our active buy and build strategy to develop a regional and edge platform of high-quality data centres in Western Europe, significant expansion projects are now underway at all three of these locations to meet and serve the growing demands of our customers.

Our vision is to become the preferred place for organisations looking to deploy digital infrastructure securely and efficiently – IT, connectivity or other services – in the general area of their place of business, whether to satisfy their own and their customers' needs, or to serve the local community of enterprises, government and other users.

For more information **CLICK HERE.**
www.portusdatacenters.com

Secure IT Environments

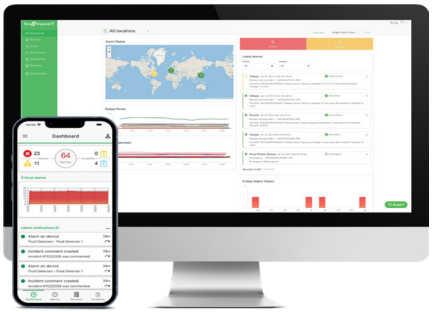
Secure IT Environments' innovative Micro DC solution is completely flexible, supporting a diverse range of applications from retail to production lines and operating theatres. Micro DCs can be located inside or outside and weatherproofed with security protection for unstaffed locations. The modular design is a cost-effective way to manage an IT estate and projects can scale to meet a budget, space or evolving need.

All mechanical and electrical (M&E) equipment in a typical data centre can be incorporated into a Micro DC including uninterruptible power supplies (UPS), cooling, fire suppression and various security features. High-density applications can be supported too, with 150kW possible in one rack. The specially designed racks are airtight, offer room neutral cooling and, dependant on the application, will even fit under a desk.

To learn more about how we can help you design, supply and install a Micro DC application for your environment **CLICK HERE,** call 01983 885182, or to send an email **CLICK HERE.**

www.siteltd.co.uk

Schneider Electric



Schneider Electric has model based, automated sustainability reporting features within its award-winning EcoStruxure IT data centre infrastructure management (DCIM) software. The release follows three years of strategic investment and rigorous testing and development as part of Schneider Electric's Green IT Program.

Available to all EcoStruxure IT users, the reporting features combine 20 years of sustainability, regulatory, data centre and software development expertise with advanced machine learning. Customers have access to a set of reporting capabilities, which traditionally required a deep understanding of manual data calculation methods.

The model offers customers a fast, intuitive and simple to use reporting engine to help meet imminent regulatory requirements including the European Energy Efficiency Directive (EED). In fact, the new capabilities go far beyond the EED required metrics. With the download function, organisations can quickly quantify and report at the click of a button – making it faster and easier to harness the power of data to reduce the environmental impact of their data centres.

CLICK HERE to find out more.
www.se.com

R&M

R&M's 19-inch modular Freenet cabinet system includes the heavy-duty Freenet Superior, suitable for installing a larger number of heavy devices. A basic frame can be upgraded to the Superior version with a load capacity of 1,500kg.

Areas of application are enterprise, edge, modular and colocation data centres. The cabinet system makes it possible to flexibly plan infrastructures in computer rooms and adapt them to new requirements. R&M inteliPhy net data centre infrastructure management (DCIM) software can also support infrastructure planning.

Freenet Superior cabinets can be screwed together to form seamless rack rows. R&M has developed electronically controlled and mechanically operated door systems. Air guide plates for individual cabinets can be used to strictly separate cooling air and waste heat. Closed cold aisle corridors and cubes can be set-up in combination with sliding doors, roof elements, cable runs, screens and bulkheads.

For further information **CLICK HERE.**
www.rdm.com

What does your UPS really cost?

If you jump from an aeroplane, you need to know your parachute is made from the highest quality material and will open – every time. Likewise, if you run a mission critical operation, you need an uninterruptible power supply (UPS) that won't let you down – ever. Louis McGarry, sales and marketing director at Centiel, explains more

At Centiel our industry leading true modular UPS solutions have been designed and refined over the years and now offer 99.9999999 per cent availability. The highest on the market.

But we have gone further. Our innovative development team is also committed to improving energy efficiency and environmental standards through quality and technological advancement. We work hand-in-hand with data centres as trusted advisors to maximise uptime and help them adopt a best practice approach to sustainability and reducing total cost of ownership (TCO).

As a result, Centiel was confirmed as a recipient of the 2023 Frost & Sullivan Technology Innovation Leadership Award in the global UPS industry. We also recently won the Intelligent Data Centre Project of the Year at the DCR Excellence Awards, and the Outstanding Contribution to Sustainability and Efficiency Award at the DCS Awards, which recognised the development of our StratusPower sustainable UPS that is now helping data centres achieve net zero targets across the world.

We all know the phrase 'buy cheap buy twice'. It's not just the cost of constant repairs and maintenance due to poor quality UPS components, but the cost of electricity required to run an inefficient system, not to mention the environmental impact. What about the cost to your organisation's reputation if and when an inferior UPS fails? Just like the real cost of using a cheap parachute, a poor quality UPS could mean severe damage or even death to your business.

The good news is that purchasing a superior quality UPS from Centiel will save your business money in the long-term. Instead of using cheap components, we leverage quality, innovation and efficiency to help organisations reduce TCO. We also calculate cost savings, giving organisations the data to make informed decisions, so they can be confident their next jump won't be their last.

CLICK HERE for further information about Centiel or to send an email **CLICK HERE.**

www.centiel.co.uk

Up close and personal

Chris Wellfair of Secure IT Environments outlines the benefits of edge data centres and the practicalities involved in making them a reality

Artificial intelligence (AI) has become part of our daily lives over the last decade – from the original announcements about Amazon Alexa in 2014 to the way we now interact with a whole host of devices from phones to televisions, computers and the individual apps we use in the workplace. We are even comfortable making AI responsible for aspects of our own safety, for example, in cars or to help us identify health problems.

ROLE PLAY

A common misconception is that AI requires huge amounts of processing power and therefore is out of the reach of most organisations to implement for their own needs. However, that is an oversimplification of how AI works, and where, particularly in a business setting, it can have a role to play.

It is true that some AI models must work with complex or large amounts of data, or support thousands of concurrent users, and these do require substantial processing power and maintainability. This can mean a huge investment for organisations to own data centres, or the use of a cloud provider of some description.

AI in the cloud can be advantageous if an organisation has a global presence to support or requires processing power that would just be uneconomical to support in-house either because of technology costs, running costs or having the staff and skills to run it effectively. For many organisations, where the cloud becomes most powerful is building the AI model in the first place. Machine learning is the technology used to achieve this, processing huge volumes of data to find the relationships between different data points and, ultimately, building the algorithms that will be operationalised as AI.

THINKING AT THE EDGE

Once the AI model is ready, if not serving millions of concurrent users, it may be far more appropriate to run the model locally, at the edge of your own network.

Edge computing has traditionally been associated with the internet of things (IoT) and naturally distributed networks such as telcos or industrial networks that connect multiple sites. A company may have previously pushed data back to the corporate network for processing, say

from a sensor, with a corresponding action back to a valve. With edge computing that analysis can happen at the perimeter, in an edge data centre, with some processing even happening on the device itself.

Combining edge architecture with operationalised AI can be very powerful and is more achievable than you might think. Where the power requirements could be very high for the graphics processing units (GPUs) and storage in a cloud data centre that builds your AI model, operational AI requires considerably less investment. If your car detects road signs, is a perfect example. The AI is running in the car, and requires far less compute power, energy, data and space than the data centre that developed the model.

LOCAL HERO

There are other good arguments for running your AI locally. Data sensitivity and privacy are common reasons to keep services off the cloud. Equally, your application may want the performance gains of having AI decisions made at the edge of the network, as close to the services they support as possible. Processing devices or application data at the extremities of the network reduces traffic and devices can even be given the autonomy to act as a self-contained unit.

Another example is the ability to run offline if a network provider outage occurs. For example, IoT devices at an industrial site, production line or building need to be able to continue providing

‘Processing power alone is not the only consideration when designing an edge data centre, and this is perhaps where the new breed of micro-modular data centres, which themselves come in a range of sizes, surprise those in need of a solution to their challenges.’

sensor data to the AI and other systems or production may too be stopped, or safety put at risk. This is especially true of isolated locations that may not be staffed.

GOING MICRO

Micro-modular data centres are one of the key solutions to these problems. Many assume they are little more than a modern cable distribution cabinet, as would have been seen housing 19U racks from old private automatic branch exchange (PABX) phone systems, but this could not be further from the truth. Micro-modular data centres can house the same technical equipment a traditional data centre might have, with an impressive level of processing power, given the small size and efficiency of modern blade servers.

Processing power alone is not the only consideration when designing an edge data centre, and this is perhaps where the new breed of micro-modular data centres, which themselves come in a range of sizes, surprise those in need of a solution to their challenges. These small data centres include all the same technology that would be expected in a dedicated data centre or larger facility including cooling, environmental monitoring, uninterruptible power supplies (UPS), CCTV/access control and even fire suppression. All this in cabinets starting at just 24U in height.

These discrete cabinets can be placed in spaces that would have been unthinkable before – plant rooms, unused cupboards or very small rooms. They can even be located in office space, or under a desk.

LEARNING CURVE

AI may have been portrayed as a silver bullet to the world's problems, but whilst we sometimes joke about it not being able to tell the difference between a cat and dog, it is making a profound impact in different areas of business and diagnostic healthcare to name but a few.

Whilst rules-based systems have been used for decades as part of systems such as enterprise resource planning (ERP), it is AI's ability to learn from its decisions and constantly adapt those rules for better outcomes that make it so powerful. This ability can lead to better risk profiles, reduced waste and downtime, and higher quality manufactured components.

POWER PACKED

Gaining the power of AI does require investment from a business and a change of mindset. However, making it a practical reality does not have to rely on huge infrastructure investments that could be seen as a huge financial risk. Micro-modular data centres offer a way to widen the tools your business can use to meet its goals without tearing up the data centre, and keeping costs under control. ■

CHRIS WELLFAIR

Chris Wellfair is projects director at Secure IT Environments. He has over 20 years of experience in designing and delivering data centres in mission critical and challenging environments across a wide range of sectors including healthcare, financial services, retail and the wider public sector.

NTT Data appoints Abhijit Dubey as CEO

NTT Data has appointed Abhijit Dubey as chief executive officer (CEO) of its business outside Japan. The news follows the finalisation of the merger between NTT Data and NTT, forming a $30bn+ global business under the NTT Data name.


Abhijit Dubey

Dubey previously served as CEO of NTT and will now lead 150,000 employees worldwide as they accelerate NTT Data's growth. NTT Data has already expanded its international footprint to approximately $18bn and has the world's sixth largest market share in the IT services industry.

Dubey brings with him a depth of industry expertise, having joined NTT in 2021 from McKinsey & Company, where he spent more than 20 years advising many of the world's most prestigious technology companies and leading CEOs. He was also responsible for launching and spearheading McKinsey's global cloud computing efforts.

Dubey said, 'I am deeply honoured to lead the company at a time of major technological change. Technology must drive positive change in the world and I believe that NTT Data's broad capabilities position us to deliver meaningful impact. I'm privileged to lead a team that is committed to clients and am excited for this next phase of growth.'

Centiel celebrates major double award win

Centiel is celebrating a major double award win. Firstly, it was named winner of the Intelligent Data Centre Project of the Year category at the DCR Excellence Awards for its project working with Sure's Tier III data centres in Guernsey.

L-R Centiel's Aaron Oddy and John Marshall of Panduit

A few days later, Centiel was also crowned with the Outstanding Contribution to Sustainability and Efficiency Award at the DCS Awards, recognising the development of its StratusPower product, which is now helping data centres achieve net zero targets across the world.

Louis McGarry, sales and marketing director at Centiel, said, 'These awards highlight Centiel's continued achievements to develop leading UPS solutions in addition to our work acting as trusted advisors to help data centres maximise efficiency, uptime and adopt a best practice approach to sustainability, while reducing total cost of ownership. We are incredibly proud that our whole team's collective efforts and our long-term vision of working towards a more sustainable future have been acknowledged in this way.'

Databarracks secures growth finance to spur ongoing expansion

Databarracks has set its sights on continued expansion having secured a significant growth finance facility from Allica Bank. It comes following Databarracks' acquisition of Glasgow-based PlanB Consulting, which it completed to further enhance its business continuity and resilience consulting practice. The funding will offer the scope to continue its fast growth at a time when the need for business and cyber resilience has never been greater.


James Watts

Databarracks managing director, James Watts, said, 'The importance of cyber resilience for businesses of all sizes cannot be overstated. Our view is that the only way to guarantee continuity is through a truly integrated approach. The problem is, there are no specialists left able to provide genuine end-to-end resilience services. Databarracks is proud to help organisations prepare for, respond to and recover from the ever-growing cyberthreat.'

CHANNEL UPDATE IN BRIEF

Epsilon Telecommunications has partnered with Neterra to expand its network presence in Europe and around the world. The partnership adds key European cities including Istanbul, Kyiv, Prague, Rome, Sofia, Vienna, Warsaw and Zagreb to Epsilon's network footprint, as well as Rio de Janeiro and São Paulo in South America.

Ezditek has appointed Stuart Manby as chief sales officer to position it for long-term growth across the Kingdom of Saudi Arabia (KSA).

Netskope has appointed Stephan Mesguich as senior vice president EMEA and LATAM. With over 30 years of cybersecurity sales experience, Mesguich will manage all sales, channel and field teams in several of Netskope's fastest expanding regions.

Axians has been recognised as 2023 EMEA Partner of the Year for Connected Security by Juniper Networks.

Teleste has appointed Steve Condra as vice president of Teleste North America and chief executive officer of Teleste Intercept. With over four decades of experience in the outside plant communications industry, Condra brings a wealth of knowledge and leadership to the team.

Vertiv and Ballard Power Systems have entered into a strategic technology partnership with a focus on back-up power applications for data centres and critical infrastructures.

Quick clicks

Your one click guide to the very best industry events, webinars, electronic literature, white papers, blogs and videos

Digital Economy Outlook 2024 is report by the **Organization for Economic Cooperation and Development (OECD).** **CLICK HERE** to download a copy.

Women Leaders In Tech Are Paving The Way In GenAI is a report from **Boston Consulting Group.** **CLICK HERE** to download a copy.

A white paper from the **European Data Centre Association (EUDCA)** talks through Scope 1, 2 and 3 requirements and provides examples of reports from the tech sector. **CLICK HERE** to download a copy of the Scope Emissions White Paper.

FOR A FREE SUBSCRIPTION TO Inside_Networks CLICK HERE

Reducing Data Center Costs And Environmental Impact is a white paper from **Legrand.**
CLICK HERE to download a copy.

DCIM Requirements - Super DCIM RFP Checklist is a blog from **Sunbird Software.**
CLICK HERE to read it.

Organisations Require A New Approach To Handle Investigation And Response In The Cloud is a report by **Cado Security** that reveals the widespread shortcomings leaving organisations vulnerable to delays in resolving incidents.
CLICK HERE to download a copy.

When Threats Are Headed For Your IT Infrastructure, Stay Calm And Manage On With DCIM And Lessons From Jaws is a blog by Kevin Brown of **Schneider Electric.**
CLICK HERE to read it.

Taking care of business

Andy Hirst of Sudlows looks at the need for mission critical physical security in and around data centres

Security around data centres is clearly crucial. Yet it is interesting that during the design stages attention is predominantly on the resilience, efficiencies, redundancies and budgets relating to the mechanical and electrical (M&E) infrastructure. Not in all, but certainly in the vast majority of facilities, security does not receive the attention it requires when really, as part of the discussion on budgets, it should play a large part.

MADE TO MEASURE

Most facilities will deploy the usual security measures as a matter of course, such as security cameras, door access in one form or another, or anti-tailgate access. It is surprising that when all this infrastructure – from the resilience of the M&E to the high-tech security equipment – is installed, policies around security protocols are overlooked or not introduced.

Who is monitoring the security? Often, we see critical sites that have no security guards and non-security personnel at the front desk. I realise there are many facilities that have all the correctly trained security staff on rotas for 24-hour cover, but it is surprising when smaller facilities that still host critical IT servers for paying clients have less than adequate security.

Visiting sites as a guest, I have seen security being contravened on numerous occasions, examples being doors propped open, two engineers doubling up through anti-tailgating portals, passing access cards to one another, and even jumping over turnstiles! With no monitoring or security guards, this does happen. All the correctly specified equipment chosen to ensure uptime means nothing if, once the system is up and running, the security is not to a high standard or taken seriously.

HOLDING A GRUDGE

Previously, articles in Inside_Networks have been written on data centre failure and the role human error plays. Well, if you get the opportunity, look at the damage caused by theft, malicious behaviour or even vendettas by previous employees.

There are so many documented instances of such behaviour, such as the case of an external contractor that was let go from their role. Unfortunately, their access card for a certain facility was not taken from them, so they were able to walk on-site,

gain access to critical equipment and cause damage.

There was also an instance where armed violators gained access to a facility and overpowered the front desk staff, enabling them to disconnect and steal several IT servers. These facilities had the resilience to maintain uptime and various security devices in place, but not the policies or protocols to deal with malicious behaviour.

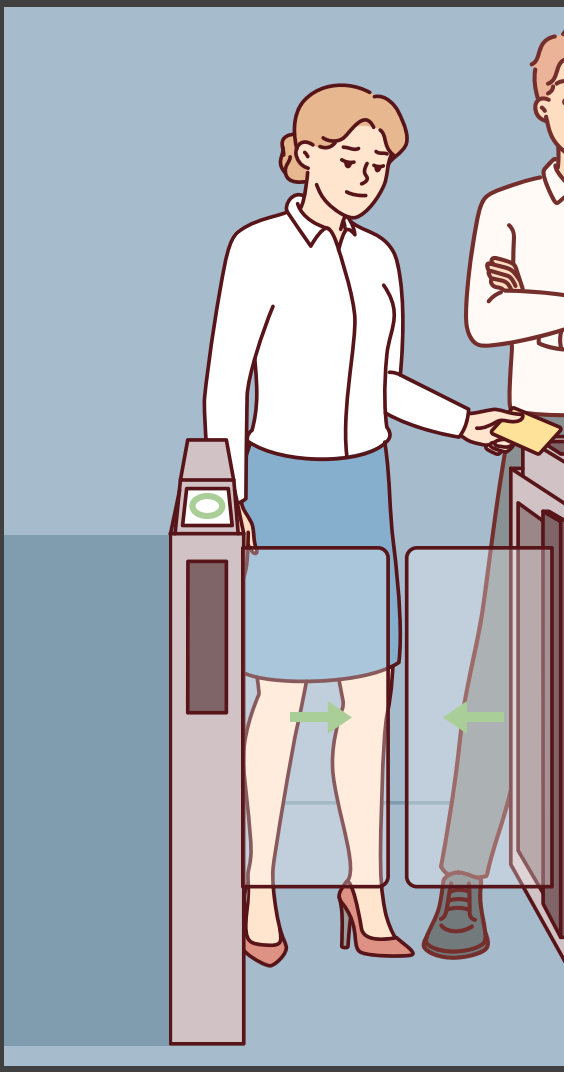
TRAIN TO GAIN

Do you have correctly trained security staff? When contractors arrive on-site, have the relevant checks been adhered

to? Are they still employed by the company you are using for the generator maintenance, or are they allowed on-site because you recognise their face as they were on-site the previous week? Have engineers visiting the site been vetted by your business – not just on their qualifications and experience, but also background checks? Are you just trusting their employer to have done this?

You may think this is excessive. However, it is worth bearing in mind the millions of pounds spent on infrastructure, including physical security, and the fact that you have clients entrusting you with their IT. Even your own IT equipment is a consideration. If it fails due to power loss, theft or vandalism, it could wipe hundreds of thousands of pounds from your business, cause loss of reputation, loss of clients and irreparable damage. It suddenly becomes a sobering thought.

Couple these potential failures with the high rate of human error and malicious behaviour, and you can see why security should not just be an afterthought or token effort. It is crucial to the protection of staff and services, and security should extend beyond physical equipment and into protocols, policies and procedures.



THINK AHEAD

I know some data centre owners and managers are reading this and thinking that they do have the correct processes and security technology in place. However, I promise that out of the many data centres I have visited or been involved in from concept, there are many that do not.

In this age of global attacks and terrorism, we should be more vigilant. I can only recall one visit to a data centre where my vehicle was searched before I could gain access to site. With data centres becoming more publicised, owners and managers should reassess whether additional protection should be implemented. If a terrorist attack did take place, I shudder to think what potential impact it would have on many data centres.

Bob Eckel pointed out in an article that following a survey of 49 American

'I have seen security being contravened on numerous occasions, examples being doors propped open, two engineers doubling up through anti-tailgating portals, passing access cards to one another, and even jumping over turnstiles!'

companies, malicious or criminal attacks accounted for 37 per cent of total security breaches. An actual attack that is widely publicised concerned a Texan who in 2021 plotted to blow up an Amazon data centre and bought what he thought were explosives to carry it out. Fortunately, his plot was foiled by the FBI and he received a 10-year prison sentence.

PROTECT AND SURVIVE

Obviously, these extreme attacks do not happen every day. However, this article aims to highlight that they can, and do, happen. It is why we should not be complacent on security by concentrating purely on M&E resilience and overlooking how a physical security breach can have a severe impact. ■

ANDY HIRST
Andy Hirst is managing director of Sudlows' Critical Infrastructures division. With over 30 years' experience in the M&E environment, he heads up a team offering high quality, effective and innovative designs for critical infrastructure projects.

Mayflex

Mayflex is a leading distributor of converged IP solutions including an extensive range of IP security and access control products.

Mayflex focuses on supplying and supporting a select number of best-of-breed vendor partners including Axis Communications, Avigilon Alta and Avigilon Unity, Hikvision, IndigoVision, Milestone, Mobotix, Paxton, Pelco, Secure Logiq, Suprema and Veracity. You can find out more about all the brands by **CLICKING HERE.**

The experienced Mayflex sales team provides excellent advice and support for choosing the best products for each requirement. Backed-up with excellent pre- and post-technical support, Mayflex is a partner that you can trust and rely on.

You can see working examples and compare the brands by visiting the M-Tech demo room, which is located at the Mayflex headquarters in Birmingham.

CLICK HERE to contact the Mayflex security sales team or call 0121 3262228 to discuss your security requirements or to book a visit to the M-Tech.

www.mayflex.com

Axis Communications

Axis Communications is a leader in network video. The company is celebrating four decades of innovation and excellence in the video surveillance industry, as it affirms a rigid commitment to the environment and meeting its ambitious sustainability targets.

Since its founding in 1984, Axis has revolutionised the security landscape, pioneering the shift from analogue to digital surveillance and setting new standards for video surveillance technology. From the introduction of the world's first network camera to the development of cutting-edge analytics and artificial intelligence (AI) powered solutions, Axis has remained at the forefront of technological advancement, empowering customers with smarter, more efficient security solutions.

As it marks its 40th milestone, it has announced the publication of the Axis Sustainability Report 2023. The company has also confirmed its ongoing commitment to reduce the impact of its own operations and its value chain on the environment with validation by the Science Based Targets initiative (SBTi) of its total global greenhouse gas emissions reduction targets.

To find out more **CLICK HERE.**

www.axis.com

North

North is a leader in the design, deployment, integration and support of advanced security systems for enterprise and data centres. Our unique understanding of both physical security and the network it resides on allows us to deliver fully integrated solutions.

We provide advanced and centralised platforms with a real-time view of security applications that allow our customers to manage their entire estate from a single place. Our experience of working in highly secure mission critical environments and data centres means we understand their unique security challenges.

From advanced CCTV and access control to perimeter detection and identity management, our solutions for safeguarding buildings, assets and data are proven over many years, and are continually enhanced. Alongside our advanced security solutions, the integration of sensor devices such as the internet of things (IoT) and intelligent management platforms enables our customers to affordably become smarter.

CLICK HERE to find out more about North.

www.north.tech

The sky's the limit

Francesco Bellavia of Mayflex outlines the benefits of cloud security solutions

Cloud-based video security uses the cloud to store and process video footage and offers several benefits over traditional on-premise surveillance systems. However, although these advantages are impressive there are things to consider before using going down this route.

A SUSTAINABLE APPROACH

We're all trying to find ways to be more sustainable in our work and personal lives. Choosing cloud-based video security products is a great way to help reduce your environmental impact and here are some reasons why:

- You can access video footage from anywhere. There is no need for people to travel to multiple sites to view recordings.
- They use less hardware. On-premise solutions typically require multiple servers that are usually made from non-recyclable components. These products typically have a shelf life of 3-5 years before they need replacing.
- Greater energy efficiency. Rather than every on-premise solution managing multiple services to store data, cloud-based security solutions can use data centres managed by global cloud solution companies.
- No on-site servers that need to be kept cool by expensive and environmentally unfriendly air-conditioning and fans.
- It removes the need for footage to be stored on products such as USBs, which are usually binned and not recycled.

EFFICIENCY DRIVE

As well as being more sustainable, cloud-based video security offers greater operational efficiency. Some points to consider:

- No time wasted driving between multiple sites, as footage can be accessed anywhere.
- User management is more flexible. On-premise solutions at big retail operations may require thousands of licences – from on-site security guards to head office loss prevention teams. By using a cloud-based video solution people can be provided with permissions to view one camera or any number of cameras and within the permission level you give them access to. It's easy to manage who has what access.

- One of the biggest benefits of cloud storage is the ease with which footage can be shared. A request for recordings can be very time consuming, especially if it's a multi-premise site with multiple cameras. With cloud storage, however, it is possible to share the footage with a few clicks of a button.

'A common misconception is that the cloud is less secure than traditional on-premise systems. However, it's wrong to think that footage kept on-site is more secure than sending things up to the cloud.'

- There is no need for large teams in security operation centres and alarm receiving centres. By using cloud-based security systems you don't need expensive security procedures with multiple monitors and servers.

- It's easy to scale-up. Cameras can be integrated and, if necessary, be replaced individually, rather than a whole system.

- It's so easy to set-up! Many cloud-based video security solutions are plug and play. It's rapidly deployable, taking 2-3 hours to set-up an equivalent on-premise solution that could take 8-10 hours otherwise. The kit arrives with a camera, a switch, a router and a security system that's ready to go with access to the cloud. Cloud video security systems use QR codes to simplify the network set-up and camera configuration. It's the epitome of plug and play. This saves engineering hours and takes the hassle out of the deployment process.

SAFETY FIRST

A common misconception is that the cloud is less secure than traditional on-premise systems. However, it's wrong to think that footage kept on-site is more secure than sending things up to the cloud. Cloud software itself acts as a gatekeeper and, because it's in the cloud, it's only outbound traffic. If you have a security system on-premise, you have data coming out and data coming in. Cloud is only pushing the data.

So, because it's only outbound traffic, you don't have to port forward, which reduces any IT difficulties. Most importantly, because it's only outbound traffic, it restricts the classic man in the middle attacks and phishing attacks searching for data packets on your network. In most cases those are carried out on inbound traffic because it's easier to intercept. Data centres managed by global companies will be much more secure.

FEATURES AND BENEFITS

With cloud-based video there is no need for footage to be monitored 24/7. Algorithms and machine learning can push suspicious events such as loitering, doors being jammed, vehicles driving the wrong way, people unexpectedly congregating, vehicles being present at unusual times and unexpected car registration plates.

If a camera has a video stream, analytics can be embedded and overlaid

to display heatmaps, which negates the need for more expensive servers to use heatmapping on-premise. There is a 15 second delay, but the result is a full analytics suite without the need for localised investment.

Cloud-based security cameras also collect and understand metadata. For example, ages of people, clothes colouring, accessories etc. If an incident occurs and there is, for example, a need to find available footage of a man with glasses and a red rucksack, this can be done in a matter of minutes and the software will find the frames he features in.

Some brands will have access control and cloud-based video security systems and the products will work seamlessly together to provide easy to use and scalable security. ID badges can be scanned and faces recognised at the same time. If entry access is denied, footage can easily be recalled to find out who was trying to enter the building. Furthermore, smart sensors will complement cloud-based video. If any humidity, temperature or liquid is detected this will notify the camera software and be flagged up.

THINK ABOUT IT

There are some things to consider before using cloud-based video security systems. Footage needs to be uploaded to the cloud, which can put pressure on networks and bandwidth availability. There are cameras that have clever bandwidth management and the footage isn't pushed 24/7 – it pushes events. If bandwidth continues to be a problem a lower resolution can be used.

Another thing is to consider upload times. If there are times in the day when there is downtime from people not using the network, there is more bandwidth available. While on-premise solutions still come with expensive costs, these are mostly upfront and budgeted for in initial proposals. Cloud-based security solutions will generally save money over the long-term but there are recurring costs – licences and cloud storage etc that need to be considered.

BRAVE NEW WORLD

Technology is constantly changing – you certainly can't stand still in this industry, so keep informed. Stay up to date and make sure you partner with a company that can help you on the journey of constant change. ■

FRANCESCO BELLAVIA

Francesco Bellavia is director of sales – security at Mayflex. He has a wealth of knowledge and experience in the distribution of security products, having worked for several distributors in his career. He heads up the security field sales team for Mayflex and works closely with security vendor partners.

Bulk doubles IT capacity at the Oslo Internet Exchange

Bulk Infrastructure has initiated the expansion of the Oslo Internet Exchange (OS-IX) with three new data halls. Bulk is expanding capacity to meet increased demand for sustainable data centre services for public and private customers, with part of the expansion already contracted.

The OS-IX expansion includes three new data halls with a total of 5.5MW capacity, meeting demand from existing customers in need of increased capacity, as well as new customers. This will double the capacity and OS-IX will be the largest data centre in the Oslo metropolitan area.

Construction of all three halls has started, with the new capacity set to be ready in the first quarter of 2025. After completing the ongoing expansion, OS-IX still has access to additional power and space to cater for further growth. In addition, customers at OS-IX are provided predictable and low energy costs through a long-term fixed price energy supply agreement entered into by Bulk and a regional energy supplier.

Equinix builds new data centre in Lisbon with an initial investment of approximately €50m

Equinix is constructing its second IBX data centre in Lisbon. The new data centre, named LS2 International Business Exchange (IBX), will be located adjacent to Equinix's existing LS1 site, forming a dynamic campus and a dense digital ecosystem. This expansion will provide much-needed digital capacity to Portugal, enabling local businesses to grow and thrive, while attracting international companies to leverage Platform Equinix in this strategically located hub for international networks and businesses.

Lisbon's increasing significance as a subsea hub makes it an ideal location for Equinix's new data centre. The LS2 facility – representing an initial planned investment of around €50m – will serve as a vital gateway to Europe from Africa, as well as serving as a key connection point for data communications between the Latin America, Europe and North America. Equinix's global platform, comprising of 260 data centres worldwide will further strengthen the digital connectivity across southern Europe.

Silicon Sands launched to make Blackpool a new home for data centre development

A plan to make Blackpool the new home for a high-performance data centre campus has been launched at an investment conference. Silicon Sands at Blackpool Airport Enterprise Zone was launched at the UK's Real Estate Investment & Infrastructure Forum (UK REiiF) to a series of potential data centre developers and investors.

Blackpool is home to the Celtix-Connect2 internet cable, connecting the town to New York, Dublin and northern Europe as part of the North Atlantic Loop, which carries up to one-third of the world's internet traffic.

Like how data centre clusters have been developed in Dublin and New York, Blackpool's access to the cable could create significant inward investment on the Fylde Coast, particularly given its low latency connectivity to the rest of Lancashire.

PROJECTS & CONTRACTS IN BRIEF

Vantage Data Centers has raised £600m in securitised term notes, marking the first-ever securitisation of data centre assets in EMEA.

Salesforce has chosen London for its first AI Centre, building on the company's $4bn investment in the UK. The AI Centre aims to foster AI innovation, collaboration and provide upskilling opportunities, reinforcing Salesforce's commitment to AI development and growth in the region.

Residents, visitors and businesses in Manchester city centre and surrounding areas will soon be enjoying enhanced mobile connectivity from Virgin Media O2 thanks to a new agreement between Freshwave and Manchester City Council. Freshwave will deploy more than 20 outdoor small cells on behalf of Virgin Media O2 in busy areas of the city including outside the Arndale Shopping Centre, Manchester Piccadilly Station and Piccadilly Gardens.

The UK Innovation Corridor (UKIC), an economic initiative joining London and Cambridge, has announced that Willmott Dixon has agreed a three-year commitment to become a strategic partner. Willmott Dixon will now take its place on the board of UKIC alongside the 15 local authorities and six universities currently represented.

Vertiv has been awarded a contract by EcoDataCenter to supply high-efficiency chilled water cooling solutions for its state-of-the-art plants being built in Falun, Sweden.

On the fairway to heaven

The Inside_Networks 2024 Charity Golf Day recently took place at the world-renowned Hanbury Manor PGA Championship Course to raise funds for Macmillan Cancer Support

The customary sunshine had been replaced by rain as players assembled at Hanbury Manor PGA Championship Course for the Inside_Networks 2024 Charity Golf Day. That, however, didn't deter anyone from enjoying a fun-filled, entertaining and laughter packed day, which raised just short of £10,000 for Macmillan Cancer Support.

With main sponsorship provided by LMG, Excel Networking Solutions, Splice Group, Onnec and CNet Training, 34 teams and 136 people took part. Teams from LMG, Edmundson Electrical, Curran IT, RWL Advanced Solutions, Panduit, Networks Centre, Splice Group, CNet Training, CBRE, Netceed, Excel Networking Solutions, Bluepoint Technologies, CommScope, Future-tech, Joyce Solutions, 2bm, Wesco Anixter, Lynchpin Media, Blue Helix, Data Tech Holdings, Onnec, EnerSys, SCCI Alphatrack, Molex, Webro and Structured Networks Technology gathered to battle it out.

The tightly fought Team Competition saw Team LMG 2 emerge victorious on 100 points, with joint runners-up in the shape of Team Bluepoint Technologies 2 and Team 2bm, both on 94 points. The day's Best Individual accolade went to Rob Fullicks of Team 2bm, while winner of the Netceed sponsored Nearest the Pin competition was Stuart Read of Team Netceed 2.

This year it was the turn of John Byron of Team Splice Group to take the Netceed sponsored Longest Drive accolade. PGA golf professional and director of golf for ACE Golf Challenge, Ady Wheatcroft, demonstrated a range of amazing trick shots. He hosted the Structured Networks Technology trick shot Beat The Pro competition on the Par 3 11th, where there were 24 winners. In the end, Andy Mason of Team Mayflex was drawn out of the hat as victor.

After drying off, attendees enjoyed a three-course dinner, prizegiving, auction and charity raffle. The generosity of sponsors and participants alike was phenomenal and the donated auction prizes saw some fierce bidding. The traditional game of heads and tails provided a moment of collective participation and the winner, Ken Hillyer of CNet Training, in a move that encapsulates

WE ARE MACMILLAN. CANCER SUPPORT

Team CNet Training 2 raise a glass

‘Well organised with, as always, a fantastic atmosphere. It’s the main event in the calendar every year that brings together all parts of the industry to enjoy some golf, raise money for a wonderful cause and network with contacts across the market.’
John Marshall – Panduit

Team Panduit mean business

the spirit of the day, donated his cash prize back to Macmillan Cancer Support.

'The Inside_Networks Charity Golf Day is a highlight of the industry calendar, said Rob Shepherd, editor of Inside_Networks. 'As usual, the event provided a welcome opportunity for all areas of the industry to take part in some good-natured competition. Once again, I'm incredibly proud of our industry for showing such generosity and I would like to extend my thanks to all the players, sponsors and organisers for making the event such a success.'

Andrew Stevens, one of the event organisers and CEO of CNet Training, added, 'A huge thank you to everyone who has supported the event again this year and contributed to the £150,000 total amount we have raised over 19 years. Special thanks to Rob Shepherd and Mark Cumberworth for organising the day and it's great that the event's popularity continues. Don't forget to book early for the 20th anniversary event next year!'

Alex Howe, Macmillan Cancer Support's relationship fundraising manager attended and commented, 'Right now, more than three million people are living with cancer in the UK. By 2030 this figure will rise to four million. Macmillan Cancer Support is here to help everyone with cancer live life as fully as they can, by providing physical, financial and emotional support. We'll do whatever it takes, no matter what a person's needs are, we will listen and support them however they need us to – big or small. As an organisation that is 98 per cent funded by public donations, we are so grateful to those who took part in the Inside_Networks 2024 Charity Golf Day.'

The Inside_Networks 2025 Charity Golf Day will take place on May 21st. Those interested in taking part are advised to register early, as places are limited. To enter a team or get more information about the various sponsorship opportunities that are available **CLICK HERE** to email Mark Cumberworth of Slice Golf and Events or call 07769 696976.

Steve Parker of Team Curran IT gets into the swing of things

Team Onnec get set

Team Molex put their best foot forward

‘It is incredibly rare for any organisation to complete a trifecta of professional networking, positive fundraising and social connection. Molex is very proud to have contributed to what took place at Hanbury Manor for the annual Inside_Networks Charity Golf Day. From the organisation, the activities on the day and the evening festivities, we were delighted to have been connected with the event.’
Mo Boolaky - Molex

L-R Alex Howe, Mark Cumberworth and Liam DeRoe at the registration table

'The team had a fantastic time, enjoying every moment on the course. The event was well-organised, and it was great to contribute to a worthy cause while having fun. We look forward to participating again next year!'
Ashleigh Richards - SCCI Alphatrack

The Beat The Pro competition on the Par 3 11th

'Apart from the rain it was another great day! The course gives all abilities a chance to play and score.'
Mark King – 2bm

'Once again we had a fantastic time at the Inside_Networks Charity Golf Day. Thoroughly well run, it raises money for a great cause that touches us all. We can't wait for the 2025 event.'
Mike Thompson – Edmundson Electrical Ltd

A big thanks to all the event sponsors:

LMG

excel without compromise.

ONNEC

Team Netceed 1 don't always look like this!

'Golf is a game meant to be enjoyed, not just endured. It is about having a good time and what better way to add a dash of joy than by sharing a laugh with old and new friends. We should all swing away, chuckle a lot and remind ourselves our lucky we all are.'
John Bath – Curran IT

A great day as always – even the weather didn't dampen our spirits! It's the one day of the year when everyone in the industry comes together for a fantastic cause.'
Keuan Rowe – MG

Schneider Electric

Schneider Electric's revamped data centre white space portfolio, where racks and IT equipment sit within a data centre, includes the second generation of NetShelter SX enclosures (NetShelter SX Gen2).

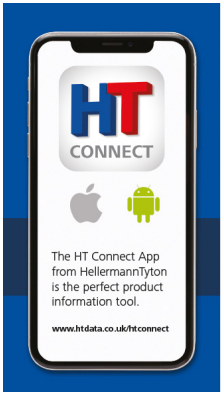
The NetShelter SX Gen2 enclosures are specifically engineered to support the demands of contemporary data centres. These new racks can support up to 25 per cent more weight than previous models, handling approximately 1,814kg, which is essential for accommodating the heavier, denser equipment associated with artificial intelligence (AI) and high-performance computing.

Enhanced perforation in the doors increases airflow, which is vital for cooling high-density server configurations, and the racks offer more space and better cable management options for larger, more complex server set-ups. The enclosures also feature all-steel construction and three-point locking systems to improve data centre protection.

For more information **CLICK HERE.**
www.apc.com

HellermannTyton

The HT Connect app from HellermannTyton includes our range of local area network (LAN) connectivity products. Designed to bring products to life in a live environment, HT Connect uses augmented reality (AR) through your mobile phone or tablet, allowing you to see a wide range of products on your desk, on a wall or even out on-site.



Take a closer look at our products, with many of the selected models having moving parts such as opening doors, removing covers or lifting trays. Use your touchscreen to rotate the products and zoom in up to 500 per cent.

HT Connect also provides additional product information including data sheets, installation guides and videos. This gives installers and engineers in the field everything they need at their fingertips when it comes to optical fibre network installation.

To find out more **CLICK HERE.**
www.htdata.co.uk

NetAlly

NetAlly's new LinkRunner AT network and cable testers continue a 20+ year legacy of innovative troubleshooting tools for network professionals.

The LinkRunner AT 3000 delivers fast and comprehensive validation of copper and fibre optic network links with powerful network connectivity troubleshooting. While offering the same core functions of its predecessors (LinkRunner AT 1000 and LinkRunner AT 2000), the LinkRunner AT 3000 features a large touchscreen and a more in-depth AutoTest that provides deeper network visibility on Ethernet links from 10Mb/s to 10Gb/s – all at the same price as the LinkRunner AT 2000.

With the addition of network discovery, path analysis and packet capture, the LinkRunner AT 4000 provides deeper visibility and diagnostics, enabling network professionals to quickly resolve issues impacting single or multiple devices and network segments. Automated topology mapping in Link-Live, NetAlly's collaboration, reporting and analysis platform, delivers up-to-the-minute accurate networks maps for easy documentation.

To find out more about NetAlly **CLICK HERE.**

www.netally.com

All you need to know

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Response mechanism

Vertiv's Martin Ryder takes a look at how data centres can meet artificial intelligence (AI) workload challenges

Over the past few years, the emergence of AI has heralded a paradigm shift in the digital landscape. This transformative technology has created a surge in demand for computing processing capabilities, meaning that the IT infrastructure is facing significant strain. If not addressed, this strain is likely to get worse and could cause technology issues – and we all know that any kind of downtime affects operations and costs businesses both financially and reputationally.

WORKING IT OUT

In response to this burgeoning demand, data centre operators find themselves at a critical juncture, where they must innovate to effectively navigate the challenges posed by this AI driven era. Recognising the urgency of the situation, they are increasingly acknowledging the need to rethink their traditional design paradigms.

To remain relevant and resilient in the face of these evolving demands, today's data centre operators are undertaking a

‘To ensure success in the realm of AI, it’s crucial to take a holistic approach to data centre architecture. It is good practice to involve all stakeholders, recognising the importance of collaboration and communication across diverse disciplines.’

comprehensive reassessment of their infrastructure strategies. This entails not only making tactical adjustments but also embracing a holistic approach that encompasses significant changes to network architecture, power systems and thermal management protocols.

By embracing this ethos of innovation and adaptability, data centres can not only address the immediate challenges posed by the proliferation of AI workloads but also position themselves as frontrunners in shaping the future of digital infrastructure. This proactive stance not only ensures their continued relevance but also underscores their commitment to driving more sustainable and efficient operations in an increasingly AI driven world.

AREAS OF EVOLUTION

For data centres, there are two pivotal areas that demand immediate attention to effectively accommodate the escalating demands of AI workloads.

• Power

The first major challenge in data centre design is the substantial increase in power requirements, driven by the deployment of specialised processors crucial for handling AI workloads. To tackle this, data centres need to find new solutions that save and use energy smartly. Deploying energy efficient hardware as a priority and taking advantage of advances in processor technology are key strategies for success – helping data centres address sustainability concerns, while meeting the rising power demands of AI operations.

Critical infrastructure providers are taking a leading role in providing innovative solutions for power management and optimisation in the wake of AI demands. We know that there is an emphasis on the integration of energy efficient hardware within data centres, which involves not only adopting state-of-the-art hardware designs but also staying abreast of advancements in processor technology.

However, the strategic emphasis on

power efficiency goes beyond immediate operational needs – aligning with the imperative of promoting sustainability in the face of escalating energy consumption. By taking a forward-thinking stance on power efficiency and management, data centres can not only meet the challenges posed by burgeoning AI workloads but can also contribute to a more environmentally conscious and sustainable future.

• Cooling

To enable sustained optimal performance and mitigate the risk of hardware failures stemming from overheating, data centre architects should prioritise investment in cutting-edge cooling solutions. This includes leveraging innovative technologies such as liquid cooling systems and advanced heating, ventilation and air conditioning (HVAC) set-ups.

Achieving a balance between processing power and effective thermal management also emerges as paramount, safeguarding the durability and dependability of the entire data centre infrastructure. Such measures not only enhance operational efficiency but also fortify the resilience of data centres in the face of escalating AI driven workloads.

Thermal management within data centres, not least the ongoing trend toward liquid cooling, is an equally important consideration. Throughout the years, data centre designs have progressed from chilled water systems to indirect adiabatic systems, with a recent resurgence of interest in chilled water systems with three distinct options for liquid cooling at the rack level.

The first option involves directing liquid to the server itself, using a room-based heat exchanger to reject heat back into the air. This modular system allows seamless integration without substantial changes to existing infrastructure. The second option introduces a cooling distribution unit (CDU), directly circulating liquid from the server or graphics processing unit (GPU), connected to a chilled water system. And the third option is an interchangeable liquid to gas system. This approach incorporates a remote condenser on the roof or building, utilising gas to liquid heat exchangers for deployment flexibility.

Ultimately, with the progress in liquid cooling, it is most likely that air cooled and liquid cooled solutions will coexist. Even within liquid cooled servers, elements necessitating air cooling persist, highlighting the nuanced nature of the evolving thermal management landscape.

HOLISTIC APPROACH

To ensure success in the realm of AI, it's crucial to take a holistic approach to data centre architecture. It is good practice to involve all stakeholders, recognising the importance of collaboration and communication across diverse disciplines. Engaging not only power and cooling specialists but also those responsible for facility management, storage and technology deployment fosters a comprehensive understanding of the data centre's intricate requirements.

As data centres embrace denser configurations and rapidly evolving

technology, the holistic approach extends to decision making timelines. While operators may be inclined to defer decisions to the final stages of design, a balance must be struck to avoid risks associated with delayed investments and potential loss of market share. Holistic design, therefore, involves streamlining decision making processes while considering lead times and involving stakeholders at every stage.

In dialogue with industry experts, the importance of interchangeability surfaces as a critical consideration for clients. In some areas we have seen a slowdown in direct deployments by hyperscalers, which may reflect a strategic pause to understand what technology changes and specifications are required. Challenges arise in finding the optimal operating conditions for high performance central processing units (CPUs) and GPUs, with manufacturers defining specifications and clients striving to plan for a diverse technology landscape over the next 5-10 years.

POLE POSITION

In embracing a holistic design philosophy, data centres can position themselves to thrive in the face of the burgeoning demands of the AI driven era. Sustainability and efficiency become the bedrock of operations, ensuring that data centres lead the charge in an era defined by growth and technological innovation. ■

MARTIN RYDER
As channel sales director at Vertiv, Martin Ryder helps organisations to power their mission critical applications. He leads the channel team leveraging Vertiv's portfolio of products.

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