

THE NETWORK INFRASTRUCTURE E-M

All over  
place

IS THE  
WHERE

Boxing  
clever

THE BENEFITS OF RACKS AND  
CABINETS WITH ADVANCED  
MONITORING AND MANAGEMENT  
CAPABILITIES



Inside\_Networks

# r the

THE NEED FOR RELIABLE POWER REDEFINING  
WHERE DATA CENTRES ARE LOCATED?

## Predictive text

WHAT WILL DATA  
CENTRES LOOK  
LIKE IN 2030?



## Explore the Road to 800G and 1.6T Applications

As cloud evolution and the emergence of generative AI (GenAI) continues to accelerate, the demand for robust and high-speed data center infrastructure has never been greater. The need to efficiently handle massive amounts of data and ensure seamless connectivity is pushing the limits of current technology, making the transition from 400G to 800G, and eventually to 1.6T, a critical focus for the industry.

In this deep-dive session, Ryan Harris, High-Speed Cable Assemblies Market Manager at Siemon, will provide an overview of the solutions available today and explore the advancements leading to future speeds of up to 1.6T.

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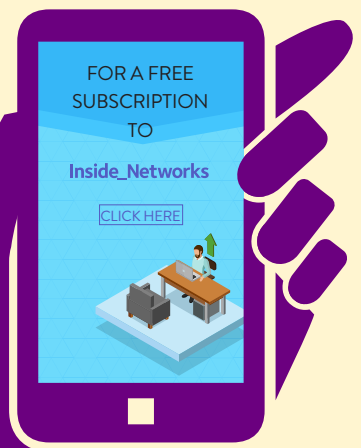
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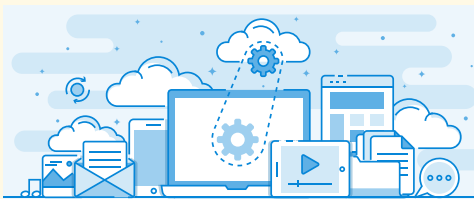
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In the past, data centres were primarily located in areas that could guarantee low latency, ensuring that data could be transferred quickly and efficiently between users and servers. Low latency has always been crucial, especially for industries that rely on real-time data processing such as finance, gaming and telecommunications.

However, the data centre sector is experiencing a significant shift in priorities, with reliable power now a major focus. This shift is prompting a re-evaluation of locations that were once considered unsuitable due to their distance from end-users. Now, if a site can offer a stable and resilient power supply, it becomes a more attractive option for data centre placement.

This reflects the broader challenges faced by the industry including the pressure to reduce carbon footprints, manage energy costs and ensure uninterrupted service. To find out whether the reliable supply of power is now the number one consideration when it comes to choosing the geographical location of a data centre, Inside\_Networks has assembled a panel of experts to examine this subject and explore how power reliability compares with other factors such as latency, connectivity, scalability and regulatory considerations.

Enclosures, racks and cabinets are often the unsung heroes of enterprise and data centre network infrastructures and in this issue we celebrate their vital and immense contribution with two excellent articles. Jon Barker of Chatsworth Products (CPI) looks at the impact artificial intelligence (AI) is having on rack densities in data centres, while Carsten Ludwig of R&M explains the need to build intelligence into data centre network infrastructure through racks and cabinets that are equipped with advanced monitoring and management capabilities.

We also have a special feature dedicated to converged network infrastructures. Rob Kelly of Sudlows identifies what needs to be considered when designing and deploying them, Aginode's Rachid Ait Ben Ali explains how to build and manage converged networks the smart way and Chris Dyke of Allied Telesis examines the benefits of deploying these systems.

With lots more besides, I hope you enjoy this issue of Inside\_Networks and if you'd like to comment on any of these subjects, or anything else, I'd be delighted to hear from you.

**Rob Shepherd**

Editor



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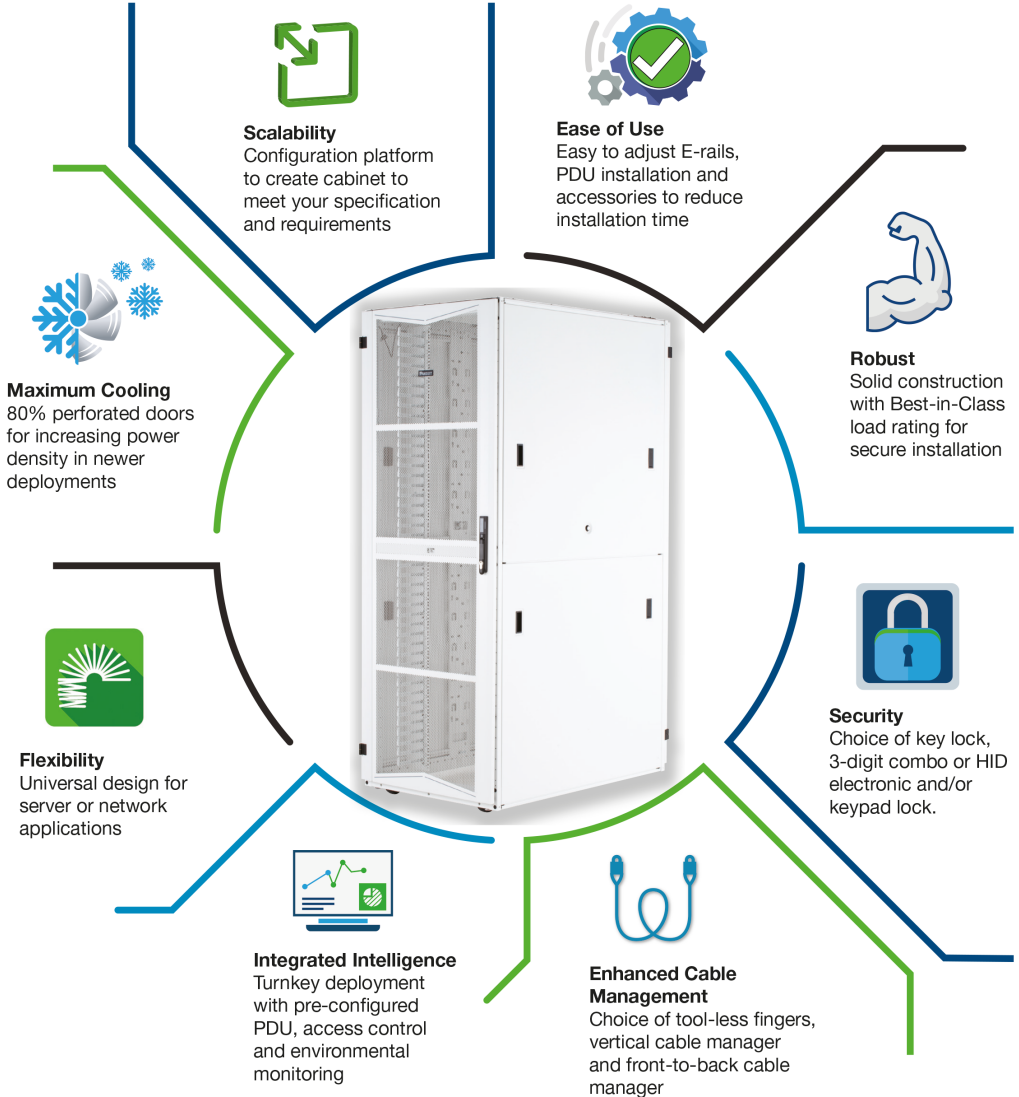
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## Organisations still value ESG as highly as security and cloud migration projects

According to research conducted by the Cloud Industry Forum, 86 per cent of businesses report that environmental, social and governance (ESG) and sustainability are still important to their organisation when deciding which cloud vendor to work – with 44 per cent considering it extremely important. This second figure is up from 30 per cent in 2023, indicating that despite media reports of ESG being put on the backburner by many companies, they remain committed to continued sustainability efforts.

The data indicates that organisations value ESG highly, with 40 per cent of respondents reporting that IT sustainability is an important project for their organisation. This ranks equally with other areas of business such as security and cloud migration, and is second only to artificial intelligence (AI) (42 per cent).

Despite this, when deciding on whether to work with a cloud service provider cost is still king, with it being the most important priority for 45 per cent of respondents. Next, 41 per cent referenced the availability of services and 39 per cent mentioned partnering with a trustworthy company as being key factors, all ranking more highly than sustainability credentials (28 per cent). However, the research also found that 49 per cent of organisations said they would always reject a prospective vendor if they gave a poor response on their ESG and sustainability strategy.

This continued emphasis on sustainability is supported by the finding that 79 per

cent of organisations are now measuring the carbon footprint of their existing data storage infrastructure in the cloud. According to the data, 47 per cent of

organisations have already been measuring this for more than 12 months, and just seven per cent indicated that they do not have any plans to measure this in the future.

Furthermore, organisations are taking crucial steps to reach net zero despite economic constraints, with 87 per cent of organisations

planning to reach net zero by at least 2050. More than a quarter (26 per cent) of respondents plan to achieve the milestone before 2030.

On the whole, businesses are largely positive about their sustainability credentials, and this is growing year on year. 31 per cent of respondents now believe the sustainability of their organisation's IT emissions is 'established and mature' – a figure that has increased from 16 per cent in 2023.

David Terrar, CEO of the Cloud Industry Forum, said, 'Despite recent media reports suggesting that organisations are watering down ESG commitments amid a difficult economic climate, this year's data shows that the focus on sustainability continues to grow. Cost undoubtedly – and understandably – remains a key factor for all businesses, but it doesn't come at the expense of sustainability. Businesses are continuing to invest time, effort and funds into ESG initiatives and are set to continue to do so.'



## Number of women taking computer science degrees continues to grow

The number of women opting to study computing at degree level this September has increased according to analysis by BCS, The Chartered Institute for IT. This year, 2,940 UK-domiciled 18-year-old women have accepted a place to study the subject, up eight per cent from 2023-24.

The male to female ratio in this area is also continuing to close slowly, with an ongoing trend towards increased participation by female students (below 4:1). However, the difference remains wide and there is still a long way to go in terms of closing the gender gap.



Julia Adamson

Julia Adamson, managing director for education and public benefit at BCS, The Chartered Institute for IT, said, 'The overall number of students, as well as the increase in the number of women opting to study computer science at degree level, is great news. However, there remains a huge demand for more skilled people to meet the needs of our digital future. The growth in the numbers and the diversity of qualified technologists needs to continue to accelerate – not only to help close the gender gap, but also to meet future needs of the UK economy.'

## Siemon recognised with a 2024 SEAL Business Sustainability Award

Siemon has been recognised with a 2024 SEAL Business Sustainability Award. SEAL Business Sustainability Awards celebrate the companies and leaders across the globe that make measurable contributions to sustainability and develop innovative initiatives that will positively impact the environment for centuries to come. Winners must demonstrate exceptional commitment to environmental, social and governance (ESG) practices.

'We are



John Siemon

immensely proud to receive the 2024 SEAL Business Sustainability Award,' said John Siemon, chief technology officer and chief operations officer at Siemon. 'We are committed to integrating sustainable practices into everything we do – from product design and manufacturing to customer service and the supply chain. This award results directly from the high level of engagement and commitment of our people to ESG principles and values. It provides positive affirmation of their dedication to environmental and social responsibility in everything we do.'

## Over two fifths of CNI organisations have suffered a cyber breach

42 per cent of critical national infrastructure (CNI) organisations have suffered a data breach, with 93 per cent observing an increase in attacks. The most common threats encountered were malware, phishing and ransomware. Nearly a quarter (24 per cent) reported to have fallen victim to a ransomware attack in the past year, with 11 per cent paying the ransom.

There's a strong correlation between compliance achievement and reduced breaches. Of those who failed a compliance audit in the last 12 months, 84 per cent reported having experienced a breach in their



history. For those that have not failed a compliance audit, only 17 per cent have any breach history, with just two per cent having a breach in the last 12 months.

Tony Burton, managing director – cybersecurity and trust at Thales UK, said, ‘CNI organisations need to take proactive measures to build cyber resilience across their distributed operations, addressing human error, ransomware, compliance and access management concerns. Emerging technologies, if leveraged appropriately, will ultimately provide greater efficiencies and security on these fronts.’

## Leading data centre companies partner with OCP and WJE to trial green concrete

The Open Compute Project Foundation (OCP) has announced a new collaboration to test development and deployment of low embodied carbon concrete or ‘green concrete’. OCP is facilitating a collaborative effort among leading technology innovators Amazon Web Services (AWS), Google, Meta and Microsoft to drive the adoption of low-embodied carbon concrete in data centre construction.

This collective endeavour is conducting research through Wiss, Janney, Elstner Associates (WJE) to test the application of low-embodied carbon concrete for

data centre floors. It targets a significant reduction in greenhouse gas emissions to greater than 50 per cent per cubic yard.

‘By aligning OCP Community’s ability to impact the data centre building material supply chain, this demonstration project will support the creation of sustainable and scalable data centre buildings. By reducing the carbon footprint associated with concrete production, we can make a tangible impact in mitigating the data centre industry’s environmental impact.

This demonstration will provide valuable insights into the performance and viability of low-embodied carbon concrete, paving the way for its widespread adoption throughout the industry,’ said George Tchapanian, OCP’s CEO.



## North American data centre vacancy rates hit record low

North American data centre supply grew by a double-digit percentage in the first half of the year, as developers delivered more capacity.

However, availability tightened further as increasing demand from cloud computing and artificial intelligence (AI) more than offset the new supply, pushing vacancy to a record low, according to CBRE's latest North American Data Center Trend Report.

There was 515MW of new supply added in the eight primary North American data centre markets in H1 2024, equivalent to adding the entirety of Silicon Valley's existing inventory. Despite the influx of new supply, primary market vacancy rates fell to a record low of 2.8 per cent, down from 3.3 per cent in H1 2023.

Data centre construction continues

to reach new highs as developers race to meet demand. There was 3,871.8MW under construction (an increase of 69.2 per cent

from a year ago) in the first half of 2024, of which nearly 80 per cent (3,056.4MW) had been preleased. A shortage of available power and longer lead times for new electrical infrastructure continue to delay completions.

'The trend has been consistent over

the past two years – demand for data centre capacity far exceeds supply, which continues to drive up pricing in a material way,' said Pat Lynch, executive managing director and global head of CBRE Data Center Solutions. 'Based on the preleasing numbers in this report and forecasts for demand, we expect to see this imbalance continue for several more quarters.'



### NEWS IN BRIEF

Equinix has entered the Philippines with the acquisition of three data centres from Total Information Management (TIM). Following the recently announced expansions in Malaysia and Indonesia, this strategic move will provide capacity for Equinix to address the digital needs of local and overseas businesses in the Philippines.

Pulsant has opened the doors on its newly refurbished Croydon Data Centre, showcasing a client-centric design aimed at boosting productivity and on-site efficiency. This is the first of the Pulsant sites to undergo a redesign, based on client feedback and user group insights, with a rollout planned to other sites in its nationwide platformEDGE network.

Zayo Group's biannual Distributed Denial of Service (DDoS) Insights Report has found that an average DDoS attack now lasts 45 minutes – an 18 per cent increase from this time last year – costing unprotected organisations approximately \$270,000 per attack at an average rate of \$6,000 per minute.

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# Why AI's regulators must p

## Hi Rob

In May, the Republic of Korea and the UK co-hosted the AI Seoul Summit, marking a significant step forward in global discussions on artificial intelligence (AI) safety. The conference built on the UK event held in November 2023, in which major outcomes included the Bletchley Declaration – an international agreement to research, understand and mitigate the risks posed by AI.

Since then, 16 companies have signed up to the voluntary standards introduced at the Bletchley Park Summit. Meanwhile, the European Union AI Act, the world's first comprehensive AI law, is starting to come into force. Change is happening – but what do more rules mean for the technology's development?

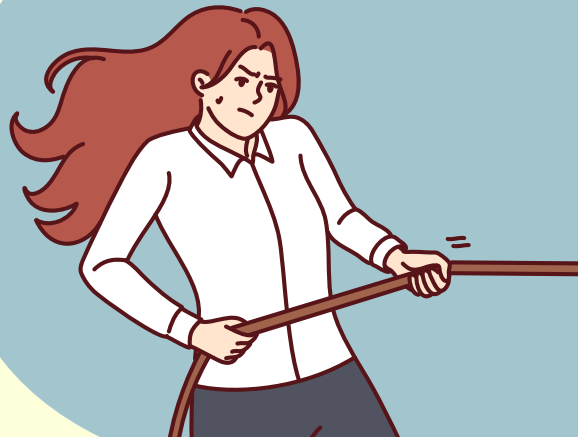
Governments and unions are now seeking guardrails for AI, proving there's no question that the technology needs regulation. However, who should regulate and how? After all, governments can promote equity and safety, but are they equipped with the technical know-how to foster innovation? Meanwhile, private organisations may possess the practical knowledge but can we trust them to ensure accessibility and fairness? The main aim of AI must be to unlock unprecedented positive opportunities – from process automation to scientific breakthroughs – that achieve societal progress.

AI's rapid progression often outpaces lawmakers' ability to create effective legislation. Its advancement creates a paradox – if regulations are too specific, they risk

becoming outdated. Conversely, flexible rules might be too vague to make any real impact.

Safety is paramount, so we need some sort of regulation. However, lawmaking by those not directly involved in AI's development may hinder technological progress, creating barriers and bureaucracy, especially for small to medium sized enterprises (SMEs) lacking the resources to comply. Overregulation may also stifle new ideas and new market players, ultimately slowing progress, as demonstrated by the UK's multiple readings in the House of Lords and House of Commons process. If governments want to take the reins, they need to prove their openness to new ways of thinking.

In 2023, the UK government released A Pro-Innovation Approach to AI Regulation, aiming to bring clarity and coherence to the AI



# prioritise innovation

regulatory landscape to facilitate responsible innovation. However, this approach aims to strengthen the UK's position as an AI leader rather than foster global innovation. Indeed, the recent UK-US agreement on AI safety shows governments can work together, but can the US ever agree a similar pact with China, for instance?

Many industry experts advocate for self-regulation, emphasising the need for agility in response to the technology's evolution. They claim that those who are unfamiliar with AI's intricacies won't ever be suited to drafting effective guardrails and may even serve to stifle its development. However, industries like pharmaceuticals are nuclear power are heavily regulated without hindering innovation. We need to find a middle ground.

In October, the World Health Organization (WHO) released new

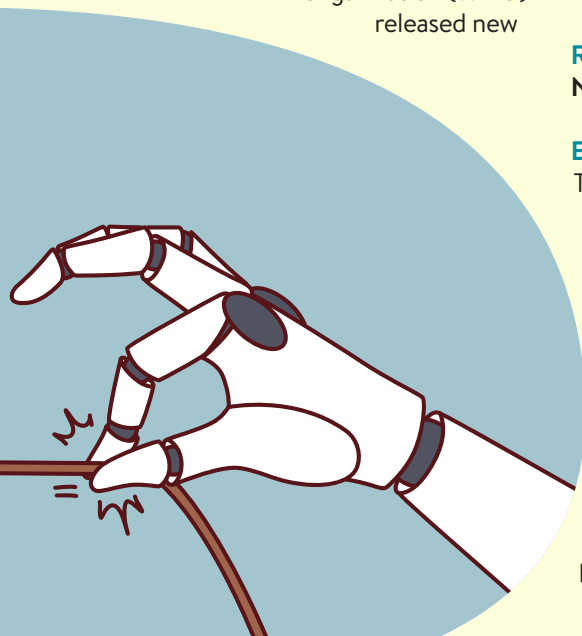
regulatory considerations on AI for health, highlighting both progress and the harm of rapid deployment in healthcare analytics. The WHO itself serves as a model for promoting safe, industry-wide innovation. A similar international intergovernmental organisation, backed by private donors and experts, can oversee public concern and promote innovation and progress within AI.

Ultimately, regulations that power the next era of global AI innovation should involve a mix of technical and societal bodies that understand AI's impact. Policymakers must collaborate with industry experts and scientists to uncover what is truly needed for safe regulation without hindering innovation. Only then will we see the technology's true potential – knowing that each step forward is comprehensively evaluated by those in the know.

**Rosanne Kincaid-Smith**  
Northern Data Group

## Editor's comment

The speed of AI's development and integration into society seems to have caught governments, regulators and even industry experts by surprise, without there being any real sense of the direction things are travelling in. As Rosanne points out, openness to new ways of thinking is vital but so too is clarity – and that seems to be lacking. This needs to be addressed quickly if AI is to be used as a force for good rather than strengthening the position of bad actors.





# Make hay while the sun

## Hi Rob

You only have to look at the past 20 years to see how quickly things change. With the recent and further introduction of artificial intelligence (AI) and machine learning, in the next two decades we will see many more advancements, mainly due to the acceleration of the creation and adoption of new technology.

However, technology needs power and we are already facing an energy crisis. There are so many unknowns but one thing is for certain, our reliance on energy is only going to grow. This is already causing challenges that need to be solved. However, with challenges also come opportunities and we need to make hay while the sun shines and seize the opportunity to sow seeds for the future.

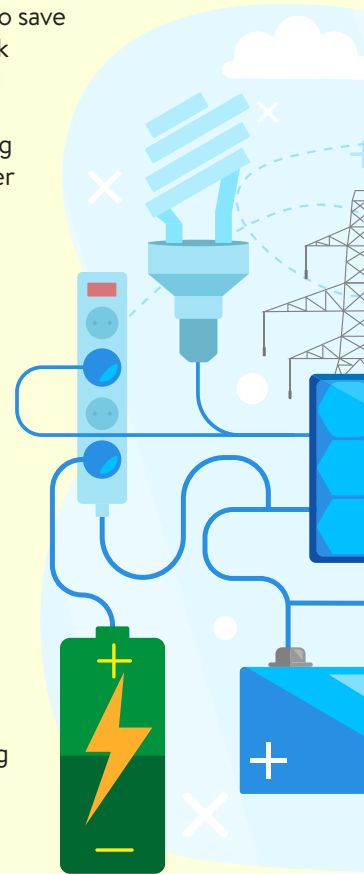
Currently, uninterruptible power supplies (UPS) protect sensitive and critical loads. The opportunity I see is that, without exception, UPS all have associated energy storage banks and this energy could be used better.

The fact is that there are UPS all over the world supporting millions of kW of clean, guaranteed power and they all have their own energy storage, whether that's valve regulated lead acid (VRLA) batteries or lithium-ion phosphate (LiFePO<sub>4</sub>) batteries that are known for their cycling ability. Therefore, I believe the future of the UPS market will not just be about critical power protection but power management and how we can use UPS to cultivate this stored energy and put it to better use.

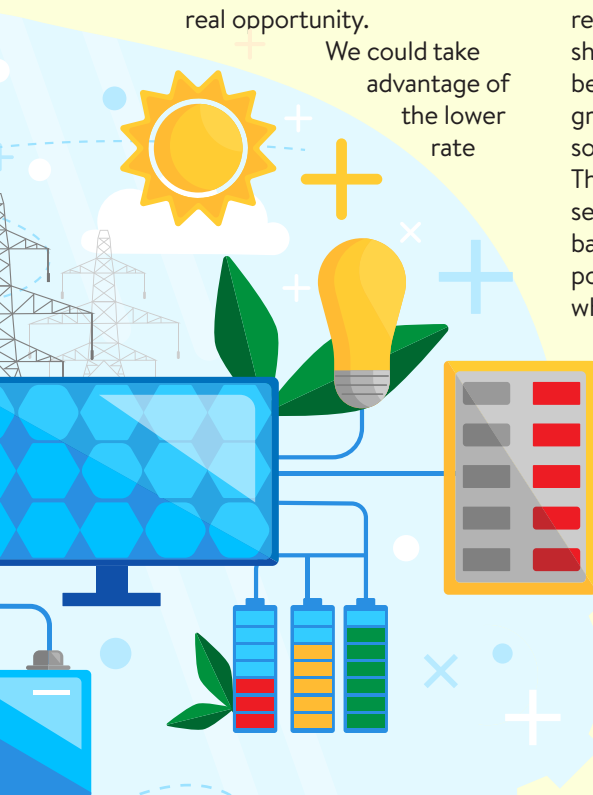
We are already able to use the UPS combined with appropriate battery storage for peak shaving. This is a way that facilities can actively use their own

energy storage to save costs during peak times of demand on the national grid. Peak shaving helps avoid higher electricity prices or fees that are applied when going above maximum peak load. Peak shaving can be achieved by either reducing usage levels by switching off non-essential equipment or by utilising UPS battery storage, reducing energy taken from the grid while batteries simultaneously discharge during high-rate demand.

Peak shaving can save on the high cost of grid power at peak times, but this is just the start. For most of its life, a UPS has energy stored away in its batteries, which are on standby and rarely used. Deploying some of that stored energy each day to offset grid power saves money and, to some extent, addresses the energy crisis. However, the question then becomes how to recharge the system, and here is the



# shines



real opportunity.

We could take  
advantage of  
the lower  
rate

renewables are online – when the sun is shining and the wind is blowing. It would be easy to see data centres set in large grounds with their own wind turbines or solar capabilities installed for this purpose. This also gives rise to the opportunity to sell energy generated from renewable back to the grid during peak times, potentially creating a revenue stream, while doing our part to manage energy better.

We don't fully understand what the future holds right now, but the energy crisis is not going away. UPS products for the future need to be selected not just to protect critical loads but to contribute potentially to the biggest energy yield. It's time to think about which seeds to sow to be ready for next season's harvest. A harvest which must be about energy and how we store it and use it for a better future.

**Louis McGarry**  
Centiel

overnight  
from the grid or, and  
here's the exciting bit, adapt the system  
to use renewable energy. A UPS has  
the potential to become a microgrid or  
energy hub, storing and delivering energy  
from renewable sources into the facility  
when required. Energy harvested from  
renewables and stored by the UPS would  
then essentially be free.

Renewable energy could be used  
alongside grid energy at any time.  
Batteries could be recharged when

## Editor's comment

Having a UPS as an energy storage and delivery device makes sense in every way. Using them in smarter ways not only takes pressure of the grid but also helps transition to a cleaner, more sustainable energy system by optimising the use of renewable energy. As Louis makes clear, the energy crisis is unlikely to go away in a hurry and even if it does there is always the potential for another one. Therefore, it's time to plan ahead and make the most of UPS technology.

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# Where the action is

Reliable power is now a critical factor in data centre location decisions, driving a re-evaluation of previously unsuitable sites that can effectively address this challenge. [Inside\\_Networks](#) has assembled a panel of industry experts to examine this issue and assess where power ranks in terms in the overall decision-making criteria

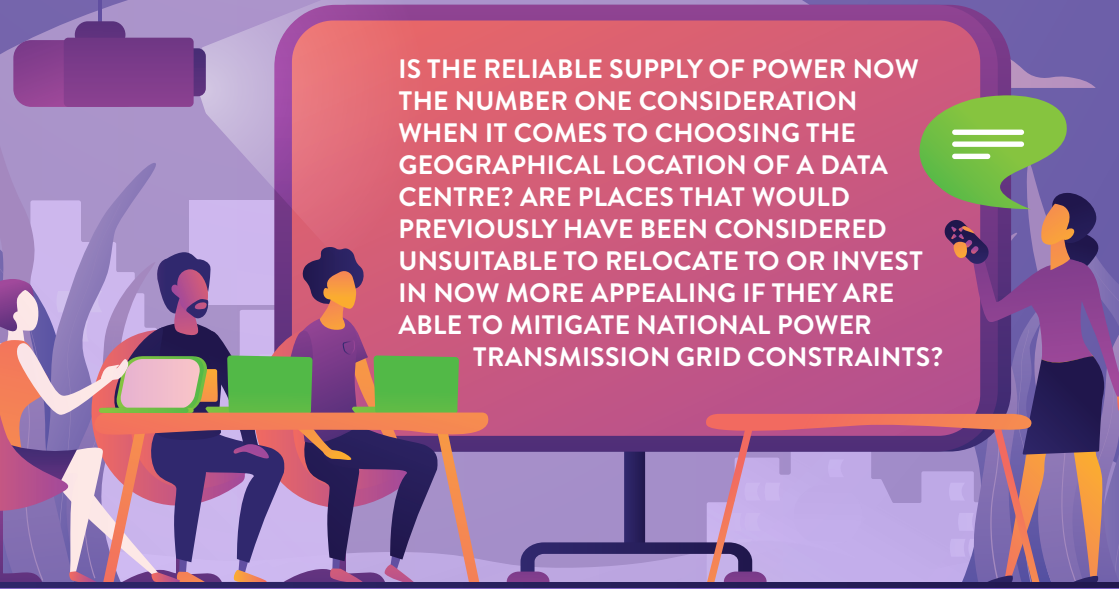
▶ For much of the time they have existed, data centres have been located in places that could ensure low latency – the term given to how long it takes for a packet of data to get from one designated point to another. As a rule of thumb, the further away the end user is from the data centre, the longer the period of latency.

However, as the demand for data processing and storage grows exponentially through artificial intelligence (AI), data centre energy consumption has surged, intensifying the need for a stable and continuous power supply. As a result, locations that were previously deemed unsuitable due to remoteness or other logistical challenges are now gaining appeal

if they can offer solutions to national power transmission grid constraints.

Regions with abundant renewable energy resources, such as wind or solar power, or those with access to stable power grids are also becoming attractive. Meanwhile, the ability to mitigate grid constraints through localised power generation, microgrids and energy storage solutions is increasingly valued.

To gain a sense of perspective on the issue, [Inside\\_Networks](#) has assembled a panel of experts to examine this subject and assess where power availability ranks in importance compared to the other factors that are considered when selecting a data centre location.



IS THE RELIABLE SUPPLY OF POWER NOW THE NUMBER ONE CONSIDERATION WHEN IT COMES TO CHOOSING THE GEOGRAPHICAL LOCATION OF A DATA CENTRE? ARE PLACES THAT WOULD PREVIOUSLY HAVE BEEN CONSIDERED UNSUITABLE TO RELOCATE TO OR INVEST IN NOW MORE APPEALING IF THEY ARE ABLE TO MITIGATE NATIONAL POWER TRANSMISSION GRID CONSTRAINTS?

## JOHN BOOTH

MANAGING DIRECTOR AT CARBON3IT

It's always been a number one consideration, together with connectivity and access to staff. With the growth of AI it is now imperative that you have access to power and lots of it. The learning phase of large language models (LLMs) are not latency dependent, so connectivity is less of a concern, but you'll always need staff or at least local firms that can provide rapid emergency services.

Because of this need for power we have seen remote locations, such as Iceland and the far north of the Nordics, promote themselves as AI ready, and the Middle East is also putting itself forward as it can access oil/gas and potentially solar. However, I'm not convinced that using fossil fuels is the right way to go from an energy efficiency and sustainability perspective.

It is the renewable energy and colder climates that are attractive when it comes to Iceland and the Nordics. Although I am less convinced about the Middle East, using data centres as a microgrid and providing other services as desalination could be a factor.

Even in the UK, the lack of power, or rather delays to the provision of grid infrastructure in the traditional data centre regions (Slough, West and East London), has meant that organisations are looking further afield. Recently we've seen large

hyperscale developments mooted for Teesside, Leeds, Blackpool and South Killingholm, where there is access to power.

Power though, is just a part of the process – planning permission is key and this looks like it may become easier to get. I

would council caution and prefer that there are robust guidelines in place to make any new developments energy efficient and sustainable moving forward – something that is absent at present.

Power, or the access to it, has always been a primary concern. The traditional UK hubs face considerable delays in getting

power (not before 2030), so it stands to reason that companies will look further afield to obtain it. The focus is now on the government and utility providers to provide that power whilst balancing their climate and sustainability goals. It is a wicked problem.



**'BECAUSE OF THIS NEED FOR POWER WE HAVE SEEN FAIRLY REMOTE LOCATIONS, SUCH AS ICELAND AND THE FAR NORTH OF THE NORDICS, PROMOTE THEMSELVES AS AI READY, AND THE MIDDLE EAST IS ALSO PUTTING ITSELF FORWARD AS IT CAN ACCESS OIL/GAS AND POTENTIALLY SOLAR.'**



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## PAUL MELLON

OPERATIONS DIRECTOR AT STELLIUM DATACENTERS

Location, location, location has been the mantra for locating data centres over the last 10 years and this is unlikely to change in the near future. That said, latency and proximity zones have also started to become larger considerations.

Until around five years ago there was no real emphasis on power density – most colocation facilities built in the last 10 years have had IT power densities of 1-2kW, with some exceptions going to 3kW per m<sup>2</sup>. The evolution of high-performance computing (HPC) in the same timescale has changed all of that, with rack power density demands of 20kW to 100kW plus.

When you scale the 50kW rack density with, say, 100 racks, this equates to 5MW. This is transformational to the data centre industry. In data centres with up to 3kW per m<sup>2</sup> the power density relationship with IT hall and engineering space was two to one in favour of internal IT space. This has reversed with HPC deployment of 50kW racks and will shrink even more with higher rack power densities.

In so doing it makes it virtually impossible for most existing data centres to scale the power to HPC requirements. This is further challenged by the significant change in relationship between IT space and engineering space now being two to one (or

more) in favour of engineering, depending on rack power density and overall demand.

The hyperscalers were first to recognise the demands of HPC both within and outside the data centre environment. Hence Amazon's deployment in Didcot and

Microsoft in Leeds, both in redundant power stations. Old power stations and major industrial centres are connected to the national grid at 66kV or higher, enabling the capability of supporting such high-power density demand – 100MW plus.

So, what has happened to latency and the proximity zones? In reality not a lot – just

the realisation that it is infinitely more practical to move data around than it is to resource large energy blocks. Where HPC deployments are concerned, the priority is locating to data centre sites capable of supporting 100MW plus deployments. These are in short supply and high demand and cannot be found in most business parks.



**'SO, WHAT HAS HAPPENED TO LATENCY AND THE PROXIMITY ZONES? IN REALITY NOT A LOT – JUST THE REALISATION THAT IT IS INFINITELY MORE PRACTICAL TO MOVE DATA AROUND THAN IT IS TO RESOURCE LARGE ENERGY BLOCKS.'**

## MARK YEELES

VICE PRESIDENT SECURE POWER DIVISION AT SCHNEIDER ELECTRIC UK&I

Resilient power is one of the most fundamental components of any data centre and reliability is the foundation upon which the industry has been built.

However, it is not the only consideration when choosing the geographical location of a data centre, and there are several others that today's owners and operators must factor into their decision making.

For example, in addition to access to land and renewables, data centres need to be designed and built in places where issues surrounding the skills shortage can be addressed and overcome. This could mean that data centres are built in cities with an abundance of students undertaking technical degrees around different facets of environmental, social and governance (ESG), sustainability, energy and engineering.

Another key point is that today's data centres must be good corporate citizens and deployed in places where they can be of significant value to local communities. For example, where the infrastructure can provide waste heat to surrounding buildings or create opportunities for employment from local businesses.

A further and important consideration with regards to building on greenbelt land is that we must broaden our horizons and ensure there's no trade-off between new data centres and sustainability. There are, for example, a host of ex-industrial sites and legacy buildings that have access to power

and provide us with ample opportunity to modernise and build out new infrastructure sustainably, without impacting the greenbelt.

Another massive trend in the mission to solve the power challenge is that new data centres are being deployed in locations outside of London. Many major players are moving northwards where there is access to land, energy and skills.

Examples of this can be seen with Microsoft planning to build its new data centre at the former Eggborough power station in North Yorkshire and Kao Data's new 40MW data centre in Greater Manchester. Blackstone has also had the path cleared for its £10bn site in Northumberland, formerly intended for a Britishvolt gigafactory.

Away from this, innovation is another opportunity for data centres to operate independently of the grid. Indeed, microgrids or connecting data centres with wind or hydro power via private wire can enable the industry to reduce demand on an already constrained energy system, while allowing excess power to be sold back and made available for use by consumers.



**'RESILIENT POWER IS ONE OF THE MOST FUNDAMENTAL COMPONENTS OF ANY DATA CENTRE AND RELIABILITY IS THE FOUNDATION UPON WHICH THE INDUSTRY HAS BEEN BUILT.'**



## CHRIS COWARD

DIRECTOR OF PROJECT MANAGEMENT AT BCS

Since we began the BCS biannual survey 15 years ago, the availability of power has been ranked consistently as the single most important factor in the choice for a new data centre location.

The results of our latest report in July this year suggests that this firmly remains the case, with nearly four-fifths of respondents choosing 'availability of power' as their top influencing factor.

Indeed, the proportion of those ranking it in either of the top two positions remains at a high of 94 per cent, in line with that recorded in winter 2023. In addition, around four-fifths of our surveyed professionals expect their levels of consumption to rise over the next three years, further exacerbating the issue.

In the UK, the national grid is hindered by not just a lack of availability in certain areas but also by crippling bureaucracy preventing change. Moving forward, the solution may well be to bypass the grid by building microgrids, where possible using renewable energy. This is a way of building-in both sustainability and resilience to power supplies, especially in areas where there can be a long wait for a grid connection and can enable organisations to get their site up and running more quickly.

For data centres that are to be utilised to support AI, one real positive is that

these facilities can be located in secondary locations, as there are no latency concerns – the data is just processing. This opens the door to building in regions that are

less 'saturated' by the sector and may have better power availability, driving employment and wealth to a region. Existing empty buildings that have been left empty due to poor connectivity will become a strong option, bringing about additional sustainability benefits.

Renewables will be key. This is reflected in the BCS survey, where over the course of the next decade 86 per cent of our

respondents expect to see at least 90 per cent of their data centre energy usage to be sourced from renewable generation.



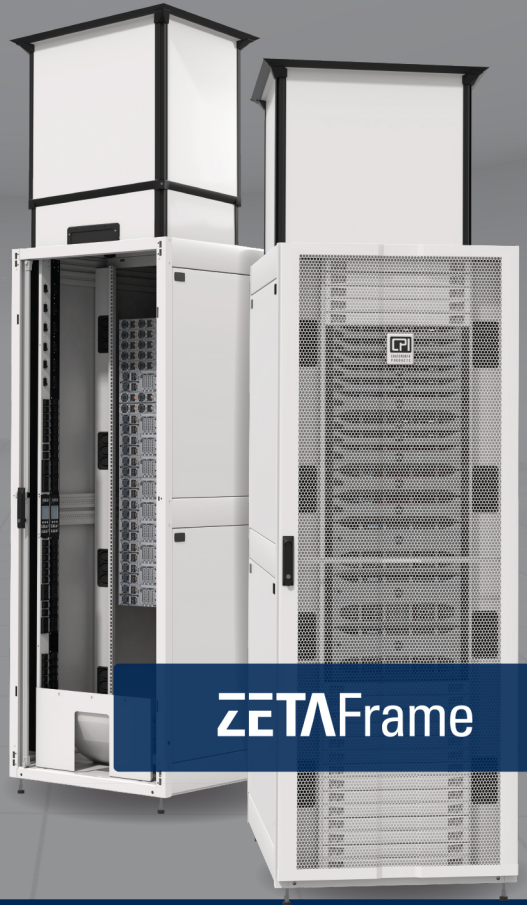
**'FOR DATA CENTRES THAT ARE TO BE UTILISED TO SUPPORT AI, ONE REAL POSITIVE IS THAT THESE FACILITIES CAN BE LOCATED IN SECONDARY LOCATIONS, AS THERE ARE NO LATENCY CONCERNS – THE DATA IS JUST PROCESSING. THIS OPENS THE DOOR TO BUILDING IN REGIONS THAT ARE LESS 'SATURATED' BY THE SECTOR AND MAY HAVE BETTER POWER AVAILABILITY, DRIVING EMPLOYMENT AND WEALTH TO A REGION.'**



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## JOHN KREYLING

BUSINESS DEVELOPMENT DIRECTOR AT CENTIEL

Data centres can, and do, operate successfully in a wide variety of locations – from deserts and cities to the Arctic Circle. However, wherever they are located they all need huge amounts of clean, reliable power to operate.

Without power there is no data processing. But power is not the only consideration, as data centres create a lot of heat that must be cooled. Also, the data they process must be carried into and out of the data centre by cables.

The need to lower Power Usage Effectiveness (PUE) has encouraged data centres to adopt adiabatic cooling over more traditional air conditioning but this technology uses a lot of water. So, you either need access to a lot of water or you need operate your cooling less efficiently and therefore need more power.

Because it is almost certainly cheaper to run new optical fibre than build a new power station, it is probable that access to enough grid supplied power is the number one consideration when locating a data centre. But this may change. With our ability to harness renewable energy, access to sufficient grid power need not be the number one consideration, as the environment and sustainability are

increasingly dictating how and where any data centre is built.

It is highly probable that renewable

energy, in some form, will be able to play a major part in powering data centres in the future. For example, solar and wind farms on, or adjacent to, a data centre could both reduce operational costs and minimise the impact on the grid. Also, with the correct energy storage infrastructure, they could supply power into the grid.

If the power problem is solved, data centres could, in theory, be located anywhere. The only problem is the planning authorities!



**'IT IS HIGHLY PROBABLE THAT RENEWABLE ENERGY, IN SOME FORM, WILL BE ABLE TO PLAY A MAJOR PART IN POWERING DATA CENTRES IN THE FUTURE. FOR EXAMPLE, SOLAR AND WIND FARMS ON, OR ADJACENT TO, A DATA CENTRE COULD BOTH REDUCE OPERATIONAL COSTS AND MINIMISE THE IMPACT ON THE GRID. ALSO, WITH THE CORRECT ENERGY STORAGE INFRASTRUCTURE, THEY COULD SUPPLY POWER INTO THE GRID.'**



## **R&M Freenet – a new Generation of Cabinets**

Discover our innovative modular cabinet system for all data, network, and server applications.

Our Freenet Rack family now also offers the Superior, with 1500 kg load capacity. R&M offers you unsurpassed modularity and flexibility, while making installation a breeze.

Get in touch - our experts are happy to have a chat.



# DAVID WATKINS

SOLUTIONS DIRECTOR AT VIRTUS DATA CENTRES

As organisations implement AI workloads, there is an urgent requirement for suitable data centre infrastructure that can support this high-growth technology. Many existing facilities simply can't meet the demands of AI and there is a possibility that there may be a shortage of the right type of supply available – large-scale facilities with renewable energy close to, but not necessarily in, major European metropolitan locations.

Over the past few years, location has been a very specific and deliberate choice, as the technological landscape was meticulously mapped to minimise latency and leverage existing data centre hubs. Today, with power constrained central metropolitan areas and the integration of AI and machine learning workloads, which can be less latency sensitive, there has been a shift in priorities, challenging the traditional principles that often dictated optimal data centre locations.

The result is a reconsideration of previous site selection norms, as these types of workloads have differing key criteria. For example, machine learning workloads are power intensive but less latency sensitive, so there is scope to look at opportunities in new locations as potential future data centre hubs.

This shift isn't about lessening the importance of low latency – it's about recognising the evolving needs of integrating AI and machine learning and leveraging existing grid capacity to

streamline future delivery. And the move towards larger campuses is a calculated strategy that acknowledges the non-linear cost relationship inherent in these operations.

Larger megascale campuses that are capable of 200-500MWs can often afford providers – and therefore customers – greater efficiencies. This challenges the longstanding industry norm, presenting a compelling argument that prioritising sheer scale over proximity and access to renewable energy can yield more efficient and sustainable outcomes.

Virtus is building a 260MW campus in Berlin, which has the potential to be a truly green data centre location, with both scale and proximity to green power. It is adjacent to Germany's largest onshore windfarms capable, via a substation and direct coupling, to supply the energy requirements of the facility.



**'LARGER MEGASCALE CAMPUSES THAT ARE CAPABLE OF 200-500MWS CAN OFTEN AFFORD PROVIDERS – AND THEREFORE CUSTOMERS – GREATER EFFICIENCIES. THIS CHALLENGES THE LONGSTANDING INDUSTRY NORM, PRESENTING A COMPELLING ARGUMENT THAT PRIORITISING SHEER SCALE OVER PROXIMITY AND ACCESS TO RENEWABLE ENERGY CAN YIELD MORE EFFICIENT AND SUSTAINABLE OUTCOMES.'**

# StratusPower – the ultimate UPS to optimise power infrastructure

Developed by Centiel's experienced team, StratusPower is a highly efficient, scalable, reliable three phase true modular uninterruptible power supply (UPS), providing peace of mind for power availability and uptime for critical power protection



Designed specifically for data centres, StratusPower is already supporting some of the largest facilities in Europe. The solution improves energy efficiency and reduces carbon footprints, and is available in a single cabinet of up to 1.5MW. This makes it the largest single input UPS system available and cabinets can be paralleled to create a single UPS system of up to 3.75MW.

StratusPower is durable due to its topology and innovative hardware and firmware design, so components are not stressed and therefore last longer. Instead of replacing consumable components such as filter capacitors and cooling fans every 4-6 years, replacements are needed every 15 years, or just once during their entire 30-year design life. It is almost 100 per cent recyclable.

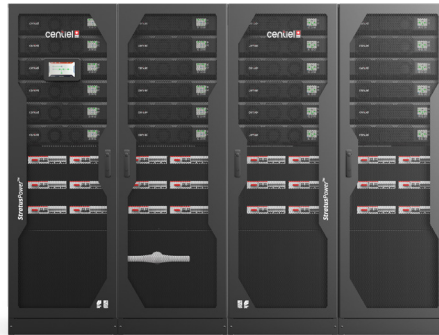
By enabling the reuse of the existing installation infrastructure due to simple top or bottom AC and DC connections and a flexible number of battery blocks, installation costs are minimised. Because of all the above, total cost of ownership (TCO) is also reduced.

## StratusPower offers:

- The only UPS technology with proven nine nines (99.9999999) per cent availability to effectively eliminate system downtime

- Class leading 97.6 per cent on-line efficiency to minimise running costs
- True hot swap modules to eliminate human error, increasing safety during upgrades
- Integral batteries and front access that improves ease of maintenance and saves space

- UPS cabinets developed and designed with scalability and flexibility in mind
- Swiss design, manufacture and testing



StratusPower's technology is also future ready to accept alternative energy

sources. Configured correctly with lithium-ion phosphate (LiFePO4) batteries, known for their cycling ability, StratusPower has the potential to become a microgrid or energy hub, storing and delivering energy into the facility when required.

StratusPower has been designed to keep data centres running 24/7 without interruption, while seeking net zero targets. With its innovative topology, advanced energy management features and unmatched scalability, StratusPower is the ultimate UPS system for data centre operators looking to optimise their power infrastructure.

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

[www.centiel.co.uk](http://www.centiel.co.uk)

# Thinking outside of the box

Jon Barker of Chatsworth Products (CPI) looks at the impact artificial intelligence (AI) is having on rack densities in data centres

▶ With experts saying it could potentially add up to \$25tn to the world's economy, AI has taken centre stage – and is reshaping how we live, work and interact. From machine learning to new capabilities like the arrival of generative AI (GenAI), and more specifically ChatGPT in 2022, powered by deep learning neural networks, this highly disruptive technology is poised to tackle complex challenges, streamline business, enhance customer experiences, and drive innovation and creativity.

## USE IT OR LOSE IT

Tech companies and enterprise businesses are jumping on board, with Gartner stating that 30 per cent of organisations that fail to use AI will soon lose their economic vitality. AI adoption among organisations has already reached 72 per cent in 2024 and the market is expected to explode at a staggering rate of 36.6 per cent from 2024 to 2030.

By utilising AI, businesses, particularly those in the IT industry, can streamline even the most complex of operations, as well as manage workloads more efficiently – thereby enhancing cybersecurity with cutting-edge anomaly detection. AI can provide real-time predictive analysis in data centres to improve overall operational efficiency by up to 45 per cent by optimising power and space, leading to a 40 per cent reduction in cooling costs. The

surge in AI adoption also creates demand for more powerful, affordable computer chips, fuelling innovation and new business models in the semiconductor industry.

## SPACE RACE

It has been suggested that the total capacity of hyperscale data centres will nearly triple by 2030. During this time, enterprise businesses will be investing more

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in purpose-built AI models for specific use cases. As this happens, multi-tenant colocation and on-premise enterprise data centres will also require more capacity.

This capacity surge will undoubtedly place unprecedented demands on data centre infrastructure due to significantly higher rack densities and higher density fibre optic connections. At the same time, the rise in energy prices, pressures from regulatory bodies and corporate sustainability goals require data centres around the world to reduce their energy consumption and reduce their carbon footprints.

### MEETING THE NEED

The great news is that data centres can cost-effectively meet the needs of high-density AI environments when the right

strategies and solutions are in place, while keeping things cool, both for both the housed equipment and the planet, by taking advantage of AI capabilities and using it themselves.

It is no secret that powerful AI processing increases rack power density and heat. Traditional rule-based AI models, such as voice assistants like Siri or Alexa, recommendation engines on platforms such as Netflix or Amazon Prime, and the search algorithms on Google, are examples of traditional rule-based AI models that identify patterns in historical data to make future predictions. These traditional rule-based models run smoothly on general purpose high-performance servers with central processing units (CPUs).





‘With rack power densities accelerating, data centre managers able to utilise AI algorithms for operational analytics have the advantage of making more precisely informed decisions, with a deeper understanding of operations, actionable insights and situational awareness.’

## SKILLS DEVELOPMENT

Alternatively, GenAI leverages deep learning and neural networks that mimic the human brain to learn, solve problems, and generate innovative ideas and content. For the most part, GenAI operates in two phases – training and inference. An AI training model pulls massive amounts of existing data from various sources in parallel to learn a new skill, the most common being large language models (LLMs) created for text generation applications. It also forms the foundation models for image, video and audio generation.

An AI inference model puts learned skills to use, all while running on high-performance CPU servers that perform operations in sequence. However, these CPU servers simply aren’t powerful enough to handle the heavy workload of

the training phase. This is where graphics processing units (GPUs) come in. A single GPU server can match the processing capabilities and consume up to 10 times more power than a dozen CPU servers. However, with these processing capabilities comes dramatically increased power consumption. Consider an AI training cluster with hundreds or thousands of interconnected GPUs and high-speed switches. The challenge is clear – exponentially higher rack power densities.

## OPTIMISING DATA CENTRES

AI is pushing average rack power densities significantly higher. According to Uptime Institute’s 2022 Global Data Centre Survey, 25 per cent of enterprise data centres reported having rack densities greater than 20kW or more, and even some hyperscale data centres are reported to have reached even higher densities of 80kW or more. This trend is continuing to rise, with forecasts predicting an average rack density of 50kW by 2027.

The higher the rack densities, the higher the heat generation, which adds a greater pressure on the already sensitive challenge for data centre operators to cool equipment within the recommended operating temperature range. Exacerbating that challenge is ASHRAE’s latest Thermal Guidelines for Data Processing Environment that includes a new Class H1 for high-density



systems. It narrows the recommended temperature range from 18-27°C (64-81°F) to 18-22°C (64-72°F).

### KNOWLEDGE IS POWER

With rack power densities accelerating, data centre managers able to utilise AI algorithms for operational analytics have the advantage of making more informed decisions, with a deeper understanding of operations, actionable insights and situational awareness. AI significantly enhances data centre infrastructure planning using its advanced analytical capabilities to anticipate future trends and requirements. AI forecasts capacity needs and identifies patterns in data, allowing data centre managers to future proof their infrastructure solutions against upcoming technology advancements.

Automated, routine tasks are covered by AI, meaning data centre managers can focus on more strategic aspects of their roles, thus improving workload efficiency. The shift from what was a human resource role to relying on AI's proficiency in managing routine tasks propels operational efficiency, safeguarding the seamless continuity of data centre operations. The collaboration between AI and data centre operators is set to redefine industry standards, ensuring data centres not only survive but thrive in the face of evolving demands.

### INTELLIGENT DESIGN

At a time when data centre operators are challenged with the goal to become more sustainable, AI applications are accelerating power consumption in data centres. However, AI is a trend which is being embraced within data centres, as it can provide the intelligence to design and operate data centres to maintain

efficiency, reliability and sustainability, and strategically work towards helping the planet's journey towards a net zero outcome. By combining the key attributes of data centre physical infrastructure with the efficiency gains of AI, owners, operators and end users can more effectively manage the power demands of high-density AI clusters, while operating in a smarter, more energy efficient way. ■



#### JON BARKER

Jon Barker is CPI's technical manager for Europe. He has over 25 years in the engineering industry, with 17 years specialising in data centre infrastructure. As technical manager, Barker serves as a technical contact, accountable for resolving pre-sales and post-sales technical support questions and issues. He also provides support to CPI's sales team by delivering product and technology-based presentations to customers, channel partners and industry event audiences.

## Networks Centre

Network and server racks usually outlive the network cabling systems installed to them, so it's only right to ensure sufficient budget and product evaluation time is allocated for this key component. Networks Centre offers solutions from leading manufacturers including Legrand (Minkels, USystems and Modulan), Panduit and Prism (a Leviton company).

Whilst all these manufacturers offer rack and aisle containment solutions, the procurement choice depends on several factors. Budget, custom/standard product, weight load support, finish, lead times, the availability of accessories and many other



factors could all influence the outcome.

Whether you have a requirement for racks in your data centre (air or water cooled), an aisle containment system to segregate hot and cold air to increase efficiency, or you need acoustically dampened racks for your busy office, Networks Centre can help you arrive at the best product choice to meet your needs.

Nick Taylor – [Networks Centre](#) and [Fibreoptic Industry Association \(FIA\)](#).

To find out more contact our expert team on 01403 754233 or [CLICK HERE](#) to send an email.

[www.networkscentre.com](http://www.networkscentre.com)

## Austin Hughes

The new Austin Hughes InfraSolution Z-3001 access control solution provides a high level of rack access security whilst supporting power over Ethernet (PoE) to reduce implementation time and the expense of having electrical power cabling installed. The compact Z-3001 control box is compatible with a variety of rack handle packages, which allows flexible and simple integration to upgrade third-party IT server racks.

InfraSolution Z-3001 provides a complete remote rack access solution



with monitoring, control, alarm and reporting. Sensors are available for complete environmental monitoring including temperature, humidity, smoke,

shock and water leakage, as well as integration support to third-party alarm systems. An optional LED beacon alerts users as soon as an issue occurs, while power and cooling management via connection to

InfraPower M series serial intelligent rack power distribution units (PDUs) and InfraCool intelligent fan units is possible.

[CLICK HERE](#) to find out more or to send an email [CLICK HERE](#).

[www.austin-hughes.com](http://www.austin-hughes.com)

## Panduit

Panduit's FlexFusion XGL Cabinets provide maximum capacity to manage high cable density in data centre, enterprise or colocation deployments. Available with lockable door solutions, FlexFusion XGL Cabinets are designed for network and server equipment and provide maximum capacity for 19-inch rackmount IT equipment. They have extensive cable management options and are suitable for hot aisle/cold aisle or thermal containment deployment.

Manufactured in welded steel, the cabinets come in fixed configurations of 600mm and 800mm widths, 1070mm and 1200mm depths and 42RU and 48RU heights. Front single hinge door and



split hinged rear doors provide 80 per cent open perforation, maximising cooling airflow to the IT equipment. Meanwhile, a 170° door open angle minimises aisle obstruction and horizontally split side panels enable easy interconnection of equipment in a side-by-side configuration, whilst brush cable top-of-the-cabinet entry points reduce air leakage.

FlexFusion XGL Cabinets are available in black and white and have a shorter lead time than Panduit's FlexFusion XG cabinets. They retain maximum scalability for future moves, adds and changes, and offer a massive static weight capacity of nearly 1.6 tons and a rolling load of up to 454kg.

**CLICK HERE** to find out more.  
[www.panduit.com](http://www.panduit.com)

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## Inside Networks

2025 CHARITY GOLF DAY 21ST MAY

*An opportunity to compete and entertain clients and colleagues at the superb Marriot Hanbury Manor Hotel & Country Club, in aid of **Macmillan Cancer Support***

This prestigious golf course was the first to be designed by Jack Nicklaus II and still incorporates features from an earlier 9-hole course designed by the great Harry Vardon. The course is now widely recognised as one of the best in England.

The event will ask for 4-ball teams to compete in a 'best 2 from 4' full handicap Stableford competition over 18 holes (with a 2-tee start from 10:30am).

Live Scoring sponsorship is available.

Golf will be preceded by tea, coffee and bacon rolls at registration and will be followed by a 3-course private dinner and prize giving with charity raffle.

There will also be opportunities for sponsorship of all aspects of the day – all raising money for Macmillan Cancer Support – since 2005 this industry event has raised just under £100,000 through our charity golf events!

### MACMILLAN CANCER SUPPORT

To book a team or for more information:

- 📞 07769696976
- ✉️ [info@slicegolf.co.uk](mailto:info@slicegolf.co.uk)
- 🌐 [insidenetworkscharitygolf.com](http://insidenetworkscharitygolf.com)

The cost of a 4-ball team is £860 (+VAT).

Discounted accommodation is available at Hanbury Manor Hotel & Country Club, which will include breakfast and use of the extensive leisure facilities.  
[www.marriottgolf.co.uk/club/hanbury-manor](http://www.marriottgolf.co.uk/club/hanbury-manor)

Teams are invited to provide a raffle/auction prize.

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## Austin Hughes

Austin Hughes InfraPower Z series enterprise level intelligent rack power distribution units (iPDUs) are embedded with dual Gigabit Ethernet LAN IP for redundant network access via IP. This ensures 100 per cent iPDU uptime reporting.

The Z series offers enterprise-level IP authentication support via Active Directory (AD) and Lightweight Directory Access Protocol (LDAPv3/LDAPS), as well as utilising the Remote Access Dial-In User Service (RADIUS) protocol and/or local credential database. Monitored and switched iPDU models are available to provide comprehensive remote monitoring and on/off outlet switching functionality from anywhere in the world.



Z series iPDUs are available in single to three phase, with new design intelligent meter and lockable/combo IEC outlets. The meter is hot swappable and field replaceable without needing to power down the iPDU or attached mission critical equipment. A 2.8-inch colour LCD with touchscreen displays kWh, kW, power factor, volt, amp, temperature and humidity. With a variety of sizes and configurations, these rack iPDUs can be tailored to specific voltage, current and connection needs, providing flexibility to address diverse power distribution requirements within the data centre.

[CLICK HERE](#) to find out more or to send an email [CLICK HERE](#).  
[www.austin-hughes.com](http://www.austin-hughes.com)

## R&M

R&M's 19-inch modular Freenet cabinet system includes the heavy-duty Freenet Superior, which is suitable for installing a larger number of heavy devices. A basic frame can be upgraded to the Freenet 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, while 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](http://www.rdm.com)

## Excel Networking Solutions

Excel Networking Solutions' **Environ** range of racks and cabinets offers a comprehensive selection of products that are ideal for a variety of applications.

Within this range, the **Data Centre (DCR Series)** racks are expertly engineered for high-density server environments, featuring optimised airflow management, high load capacity and secure access options. These features make them an ideal choice for demanding data centre applications, where reliability, efficiency and security are crucial.

In contrast, the **Acoustic (AR Series)**

racks are designed with a focus on noise reduction, incorporating advanced acoustic panels to significantly reduce noise from active equipment. This makes them particularly suited for office environments or any setting where noise control is a priority.

Both DCR Series and AR Series racks exemplify Excel's commitment to quality, innovation and

adaptability across various environments. To explore the full range of Environ racks and cabinets [CLICK HERE](#) to visit the online product catalogue. For more information [CLICK HERE](#) or contact our sales team on 0121 326 7557.

[www.excel-networking.com](http://www.excel-networking.com)



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# On a need to know basis

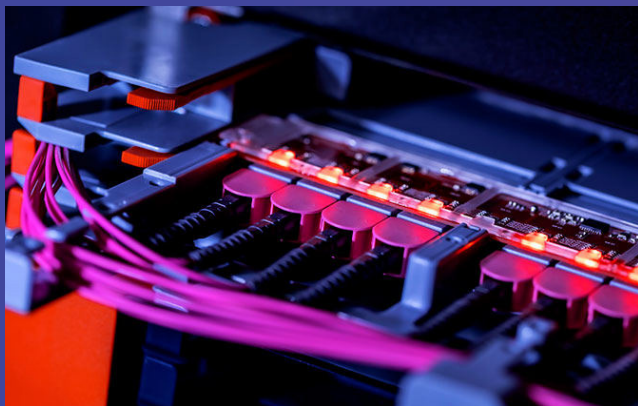
Carsten Ludwig of R&M explains the need to build intelligence into data centre network infrastructure through racks and cabinets that are equipped with advanced monitoring and management capabilities

**▶** In today's increasingly interconnected data centre environment, capacity planning, energy management, inventory management, anomaly detection, maintenance and other key processes need to be based on current and accurate insights. That requires innovative solutions that can enhance data centre resource management by improving efficiency and reducing downtime, while also facilitating intuitive interactions with increasingly complex systems.

## INFORMATION CENTRE

By integrating intelligence into data centre operations, organisations can not only enhance the efficiency and reliability of their infrastructure but also manage data centre resources in a more intuitive and interactive way. Analysing data from a wide variety of sensors and systems enhances visibility, efficiency and accuracy in monitoring and maintaining physical and virtual assets.

As data centres evolve to accommodate increasing demands for processing power and data storage, the ability to manage these resources efficiently becomes paramount. Insights into nearly every aspect of data centre operation



in combination with automated analysis, modelling and simulations makes it easier to adapt and scale to meet changing user demands, while determining whether infrastructure is future proof.

It is also possible to directly see how analysed parameters affect the realisation of key performance indicators (KPIs) and tweak them accordingly. It means data centre managers can make more informed decisions regarding infrastructure investments, operational changes and strategic planning, based on data driven insights.

## SMART THINKING

Demand for greater network connectivity is driving higher port density in data centre racks and traditional manual management

approaches are insufficient for handling this complexity and volume. Intelligent racks equipped with advanced monitoring and management capabilities can dynamically handle higher port densities. These systems enable automated identification and management of network connections, reducing the risk of human error and downtime. By integrating intelligence, racks can provide real-time visibility into port utilisation, optimise the allocation of resources and ensure seamless scalability as port density continues to increase.

As data centres pack more equipment into smaller spaces, the risk of overheating and equipment failure increases. Intelligent racks and cabinets come equipped with sensors and monitoring systems that track environmental conditions such as temperature and humidity. These systems can provide alerts and automated responses to prevent overheating and ensure optimal operating conditions.

What's more, intelligent infrastructure can help with asset management, ensuring that equipment is efficiently utilised and correctly placed to avoid hotspots and ensure even distribution of workloads.

## POWER AND COOLING

The growing power demands of data centres necessitate advanced power management solutions. Intelligent racks and cabinets can monitor power consumption at a granular level, from the overall rack down to individual components. Such detailed monitoring allows for more accurate capacity planning and helps avoid overloading circuits.

Intelligent power distribution units (iPDUs) can also enable remote power cycling of equipment, improving the ability to manage and maintain devices

without physical intervention. Moreover, predictive analytics can be used to foresee power demand trends and adjust power distribution proactively, enhancing energy efficiency and reducing operational costs. Artificial intelligence (AI) can analyse patterns in data centre operations and machine learning algorithms can predict peak loads and adjust cooling and power supply dynamically, improving energy efficiency.

Effective cooling is critical in high-density environments to prevent equipment failures and extend the lifespan of hardware. Intelligent racks and cabinets can contribute to efficient cooling by integrating with advanced systems that dynamically adjust airflow and cooling based on real-time thermal data. For instance, variable speed fans and liquid cooling systems can be finetuned to respond to the specific cooling needs of each rack, minimising energy waste. Additionally, intelligent systems can optimise the placement of cooling resources, such as directing airflow to the hottest areas and reducing it in cooler zones, thereby maintaining a balanced and energy efficient cooling environment.

## REMOTE CONTROL

Intelligent infrastructure supports automation and remote management, which are key to enhancing operational efficiency in data centres. Automated systems can perform routine tasks such as monitoring, reporting and even some maintenance activities, reducing the need for manual intervention and freeing-up human resources for more strategic tasks.

Remote management capabilities enable administrators to manage data centre infrastructure from anywhere, increasing flexibility and responsiveness to issues.





‘Intelligent racks and cabinets come equipped with sensors and monitoring systems that track environmental conditions such as temperature and humidity. These systems can provide alerts and automated responses to prevent overheating and ensure optimal operating conditions.’

This is particularly valuable in large scale or geographically dispersed data centres, where physical access to every rack or cabinet is impractical.

### SAFE AND SECURE

Intelligent racks and cabinets can also bolster security and compliance efforts. Integrated security features such as access controls, monitoring and logging can help protect sensitive equipment and data from unauthorised access and tampering. Real-time monitoring and automated alerts can also detect and respond to security incidents swiftly. Furthermore, intelligent infrastructure can assist with compliance by providing detailed records and reports on environmental conditions, power usage and other key metrics required by regulatory bodies.

Predictive maintenance powered by built-in intelligence can analyse data from a wide variety of sensors and actuators within the data centre. This makes it possible to predict equipment failures before they occur, schedule timely maintenance and reduce unexpected downtime. Technicians can collaborate remotely to troubleshoot complex issues.

Experienced technicians can guide newer personnel by providing visual instructions and annotations in real-time, regardless of physical location. AI powered simulations can replicate complex data centre scenarios, providing a safe, controlled environment for training staff.

### KEEPING IT REAL

Introducing intelligence even makes it possible to introduce advanced applications, such as overlaying step-by-step maintenance instructions or schematics. It is possible to visually identify and display information about assets, and facilitate remote expert assistance and training.

AI and augmented reality (AR) can help visualise complex data centre environments, while AI can process large amounts of data and generate visual representations of resource usage, system health and more. AR can overlay this information on to the physical data centre layout, making it easier for operators to understand and make decisions. AI also enhances load balancing by analysing data traffic and predicting peak times, enabling more efficient distribution of computational resources, which improves performance and reduces bottlenecks.

Technicians wearing AR headsets can even receive visual overlays of relevant data, schematics and instructions, making it easier to diagnose and resolve issues remotely. Virtual simulations and interactive guides help employees learn how to operate and maintain equipment, reducing the learning curve and improving overall efficiency. AR aids technicians in quickly identifying faulty components through visual overlays on physical equipment, providing step-by-step repair instructions and even connecting them to

remote experts for guidance. AI powered predictive maintenance can anticipate equipment failures by analysing data from sensors, logs and historical patterns.

## FRONT AND CENTRE

As technology keeps advancing and data centres become more complex, the role of intelligent systems in managing these critical environments will become more important. Incorporating intelligence into racks and cabinets is vital for addressing the challenges associated with higher port and equipment density, power and cooling requirements. Intelligent infrastructure enhances operational efficiency, optimises resource utilisation, improves security and supports scalability. This helps ensure data centres meet current demands and adapt to future needs.

These technologies enable proactive management of assets, enhance decision making with real-time data and predictive analytics, and improve maintenance and troubleshooting accuracy and efficiency. On demand, contextual information allows operators to visualise complex systems and data flows in a comprehensible manner. This can lead to faster decision making and quicker responses to issues.

It should be remembered that integrating analytics tools with existing data centre management systems and workflows is complex and time-consuming – often, this will require significant customisation or reconfiguration. Furthermore, storing data in silos within an organisation impedes analytics efforts. Breaking down these silos to allow for comprehensive data analysis is a significant challenge but an absolute necessity. It's important that the design of data centres with next generation connectivity is taken up as a cross-departmental effort.

## ON THE WHOLE

A holistic approach that looks at every part of the data centre and its unique requirements is key to success. A system can only become truly efficient if we observe and manage it as a completely integrated whole. As the non-compute and compute worlds continue to converge, moving well beyond the traditional silos, we can provide enormous efficiency improvement – not only for currently installed systems but also in relation to the efficiency of application coding. This can now be based on deep data and simulations from real world scenarios, providing unprecedented insights into exactly how much resources are spent on executing tasks. ■



### CARSTEN LUDWIG

Carsten Ludwig is global data centre market manager at R&M. An experienced sales and marketing director leading teams in various market verticals supporting digitalisation, he has previously worked with Siemens, Nokia and Huber+Suhner. He has built up ample experience in managing change driven by businesses, technologies and markets, as well as sales and business development, both nationally and internationally.

## Telehouse Europe turns recycled metal into funds for two Tower Hamlets charities

Telehouse Europe has turned recycled metal into a donation of £15,000 each to two London Borough of Tower Hamlets charities – First Love Foundation and Leaders in Community. The donations reinforce Telehouse’s commitment to supporting local communities in Tower Hamlets, home to Telehouse’s London Docklands campus and Telehouse South. The recycled metal itself came from the redevelopment of the Telehouse South facility.

For First Love Foundation the funds will enable it to continue its vital work addressing the root causes of poverty and crisis, rather than just providing temporary



relief. Leaders in Community will use the donation to inspire and empower more local young people in Tower Hamlets, which is known as one of London’s most deprived boroughs.

Mark Pestridge, executive vice president and general manager at Telehouse Europe, said, ‘Our recent donations to First Love Foundation and Leaders in Community, along with our ongoing volunteer efforts, are a testament to our commitment to making a positive difference in the London Borough of Tower Hamlets. By supporting these incredible organisations, we aim to help address the immediate needs of the community and create a brighter future for everyone in the borough.’

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## Portus Data Centers appoints Marco Kain as managing director

Portus Data Centers Munich has appointed Marco Kain as its new managing director. Kain is a proven business leader with 25 years in the IT industry and strong expertise in sales and project management at international companies. Most recently, he was responsible for the national channel partner business in Germany at Sophos. With his wealth of experience, Kain will make a significant contribution to further expanding Portus Data Centers’ market position.



‘New technologies such as artificial intelligence (AI) and the increasing adoption of hybrid cloud by enterprise businesses is creating exponential demand for high performance, local colocation providers,’ said Kain. ‘This offers Portus Data Centers a major market opportunity and I am very much looking forward to the new challenge and working with the entire team at

Portus Data Centers Munich.’

## Pete Judson joins Kao Data as its new COO

Kao Data has appointed Pete Judson as its new chief operating officer (COO). With more than 30 years of operational leadership experience across the complete spectrum of data centre lifecycle services, Judson has garnered a strong track record for creating and leading large-scale teams to deliver the highest standards of customer service and operational excellence.

Judson joins Kao Data from NTT, where he spent the last four and a half years aligning its EMEA-wide operational delivery organisations into a single, multifunctional, +350MW data centre unit. His appointment to the Kao Data senior management team will provide an



Pete Judson

integral piece of strategic and technical, operational support alongside Paul Finch, who transitions to the role of chief technology officer (CTO).

‘Kao Data has established an exceptional reputation for designing, building and operating world class data centres, and its entrepreneurial approach to artificial intelligence (AI) and supercomputing has enabled it to move at a pace that has exceeded the market,’ said Judson. ‘I’m excited to join the organisation on the cusp of its European expansion and to work alongside my new colleagues to exceed the high bar they’ve already set for design, customer service, technical and operational excellence.’

### CHANNEL UPDATE IN BRIEF

Mayflex has added the full range of Gardner Engineering CCTV bracketry to its product portfolio.

Stulz has opened its new Center of Excellence (COE) in Dubai. Located in the Silicon Oasis in Dubai Digital Park, it will enable the company to further expand its presence across EMEA.

Lakeside Software has partnered with Microsoft to create innovative solutions for organisations with complex IT environments. Lakeside aggregates and analyses a vast amount of endpoint and telemetry data and then uses an embedded artificial intelligence (AI) engine to rapidly provide relevant insights from this data. Through this collaboration with Microsoft, Lakeside will continue to expand and enhance end user computing with purpose-built AI for enterprise IT.

Ezditek has joined the Gulf Data Centre Association (GDCA). It joins an ecosystem of 1,500+ members to improve data centre standards in the region and enable the Gulf Cooperation Council (GCC) to become a major global data hub.

SmartCIC Global Services has appointed Albert Bosch as its managing director to grow its global sales and position it as the leading connectivity partner for carriers and service providers. Bosch joins SmartCIC Global Services from Expereo, where he led the successful integration of Brodynt.

# Quickclicks

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

Cooling Strategies For Edge Computing is a blog by **Chatsworth Products (CPI)**. **CLICK HERE** to read it.

Mastering Data Centre Modularity: The Critical Role Of Cabling is an ebook by **Onnec**. **CLICK HERE** to download a copy.

AI in 2024 is a report by **Fivetran** that looks at the importance of data readiness in making the most of your investments. **CLICK HERE** to download a copy.

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Research from **KnownHost** has revealed how accurate artificial intelligence (AI) detectors are at detecting AI generated imagery compared to human created images.

**CLICK HERE** to find out more.

Understanding Data Governance In AI: A Lifecycle Perspective is a white paper by the **Open Data Institute (ODI)**.

**CLICK HERE** to download a copy.

Maximizing Data Center Efficiency With Advanced Airflow Management is a blog by **Legrand**.

**CLICK HERE** to read it.

A Path to Sustainable Building Operations is report by **Frost & Sullivan** that provides a checklist and framework to help build an effective environmental, social and governance (ESG) strategy.

**CLICK HERE** to download a copy.



# Eyes wide open

Rob Kelly of Sudlows identifies the key considerations when designing and deploying a converged network infrastructure

With most of the devices that support our built environment requiring some form of network connectivity for operation or management, the legacy approach of separate communications platforms for each system can no longer be considered viable in most applications. Instead, converged networks provide intelligent buildings and campuses with a single unified network architecture to support a myriad of different devices, applications and users in a manner that simplifies the overall building network architecture, while at the same time lowering costs, improving efficiency and enhancing visibility.

## ALL ENCOMPASSING

The converged network offers wired, wireless and cellular network access and leverages internet of things (IoT) technologies to provide a universal communications platform for all building technologies. While there are undoubtedly very real benefits, it is also important to recognise that taking this approach also adds some challenges that must be addressed as part of the design and deployment of these systems.



The design stage of a project is important for the converged network, as it is essential that the requirements of all the devices and applications that may use the solution are fully understood and catered for within the high-level and low-level design activity. The detail gathered at this stage will define high-level concepts such as types of access, port density, network resilience and so on, but also inform the low-level design concepts such as individual virtual local area networks (VLANs), quality of service (QoS) and specific security requirements that could also include some form of network access control (NAC). Active participation of all stakeholders wishing to utilise the network is key in this endeavour.

## FEATURES AND BENEFITS

So why should we put this initial effort in and move away from the legacy approach of disparate communications platforms for different building systems? As mentioned,



there are some very real benefits to converged networks including:

- **Reduced complexity**

Moving to a single converged network reduces the overall complexity of the network services within a building, removing the need to manage and administer multiple separate networks. It also simplifies any interfaces and incoming services that may have been involved with those deployments.

- **Cost reduction**

As well as significantly reducing the cost associated with managing and administering multiple separate networks, combining network equipment, resources and communications spaces offers a major total cost of ownership (TCO) saving over the lifetime of the solution.

- **Scalability and performance**

Deploying a converged network system alongside a standards based structured cabling solution provides major advantages in change and expansion, should the needs of the organisation change over time. It also offers higher performance connectivity than most building technology solutions require.

- **Service enablement**

Converged networks support many different services and applications. Networking vendors are constantly improving the management tools and visibility available on the network – for example, the ability to analyse the performance of video conferencing calls from a network point of view.

- **Enhanced security**

Converged networks often provide greater security tools than a standalone network that has been designed for one specific



‘The design stage of a project is important for the converged network, as it is essential that the requirements of all the devices and applications that may use the solution are fully understood and catered for within the high-level and low-level design activity.’

task. Tools like NAC and advanced malware protection (AMP) help support a strong security posture that is common across the converged network and is much more effectively enforced than separate systems in isolation.

### SO MUCH MORE

Other benefits include making integration between the different building systems a much easier task, at least at the infrastructure level, thanks to the unified communications platform which all the devices reside upon.

Being able to deliver a high level of building intelligence and functionality is top of mind for many developers and building owners. The ability to manage the building infrastructure and connected technology systems can have a major impact on the property’s smart building and environmental scoring. This, in turn, offers

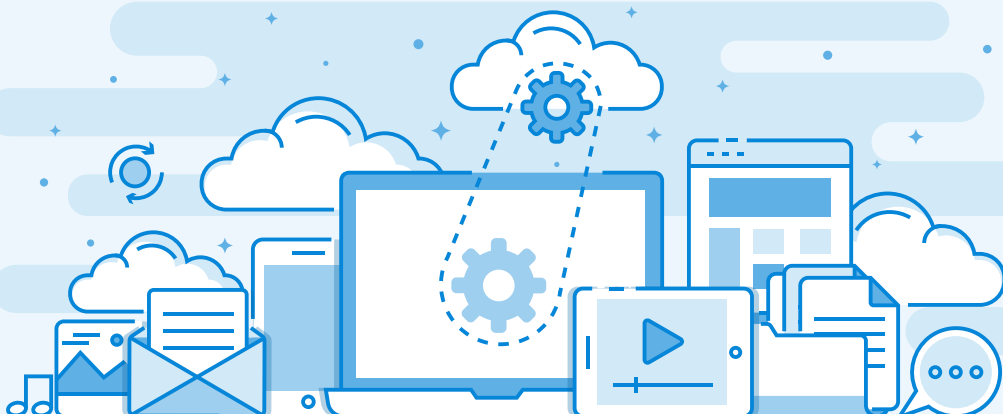
proven outcomes for building sustainability and long-term operational costs, as well as perception and desirability, which translates to longer-term rentals, better rental incomes and lower vacancies.

### ON THE OTHER HAND

Despite all the benefits, however, there are risks to deploying a converged network and these should most definitely not be overlooked. That being said, once a risk is known it can be addressed and suitably managed or mitigated. Some of the key risks that will no doubt be up for discussion when choosing whether to deploy a converged network or not will include:

- **Solution complexity**

While I mentioned earlier that a converged network can reduce the complexity of having numerous disparate network solutions supporting building technologies,



a converged network brings its own complexities.

It's essential to engage with a systems integrator that understands the complexity and 'gotchas' of deploying this kind of system, and has an understanding of the different systems that need to connect and what demands they will place on the network. If a converged network is going to cater for all the devices within the building or campus and allow them to connect via several different mediums, the level of complexity in doing this should not be overlooked.

#### • Stakeholder engagement

As we move from the legacy model of each solution provider offering its own communications platform to a converged network model, it's important to realise that this is going to increase the number of stakeholders that the network integrator will be working with. As a network integrator you're going to gain some new customers, as each of the building systems that wants to reside on the network is going to have a different set of needs and wants.

Right from the start of the design phase, this information is going to need to be captured and baked into the design so that the converged network can suitably support everything. That close engagement must continue right through the build program. It also introduces new dependencies, as the converged network becomes one of the most critical parts of the program and needs to be in place to enable the building's commissioning phase.

#### • Security

Converged networks undoubtedly provide challenges when it comes to cybersecurity. With various technologies, devices and

applications sat on the one network, the potential attack surface for cybercriminals to exploit can be extensive and the numerous technologies that reside on the network increase the chances of new vulnerabilities. Using appropriate network security tools and best design practices are essential in mitigating risk in this area.

#### MAKING A MOVE

There's much food for thought when it comes to deciding on the best approach for a building network, not least complexity, cost and security. However, particularly for buildings and campuses with a reasonable prevalence of IoT and building services-related technologies, the benefits of deploying a robust converged network system should not be ignored. ■



#### ROB KELLY

Rob Kelly has been in the communications and networking industry for over 20 years, since entering as an apprentice cabling engineer. He now holds the position of smart technology director at Sudlows. During his career Kelly has successfully delivered projects across numerous technology disciplines and in a range of different environments.

# All for one and one for all

Aginode's **Rachid Ait Ben Ali** explains how to build and manage converged networks the smart way

▶ A converged network integrates multiple communication services on to a single infrastructure. Discrete systems with limited functionality and higher costs are abandoned in favour of running everything over a single internet protocol (IP) backbone. IP networks can facilitate seamless integration and communication between different types of devices and platforms, enhancing overall functionality and user experience, while bringing significant cost and operational benefits.

## WHAT'S THE USE?

Such a solution is especially useful for building management. Integrating various building management systems (BMS) such as lighting, security, access control and heating, ventilation and air conditioning (HVAC) on to a single network simplifies overall infrastructure and lowers cabling and hardware requirements, while enhancing flexibility, productivity and operational savings. This is often referred to as operational technology (OT) as opposed to the more familiar information technology (IT).

Not long ago, we were still merging cabled voice and data systems. Later Wi-Fi was added, but building services were still in their own silos. Now, as IP and Ethernet become ubiquitous, everything across both IT and OT is being merged, which is

expected to be significantly facilitated by developments in new technologies such as Single Pair Ethernet (SPE) cabling. SPE supports an unprecedented number of devices, including countless internet of things (IoT) sensors and actuators, combining them into single systems.

## ADVANTAGES OF CONVERGENCE

First, let's take a closer look at the benefits of transmitting voice, video, data and other services, including building monitoring and management, over a single network using IP technology. This unification simplifies the overall network architecture and reduces the complexity associated with maintaining multiple network types. IP-based networks are also inherently scalable. They can easily be expanded to accommodate traffic growth and new services without extensive, and expensive, hardware changes. This scalability is crucial for businesses that need their network infrastructure to adapt with anticipated growth.

Converged networks optimise bandwidth usage and network resources by sharing equipment, boosting cost-effectiveness, performance and reliability. Organisations can introduce communication and device management methods without overhauling existing infrastructure – an essential feature in today's rapidly evolving



technological landscape. Additionally, there are substantial benefits for both employees and management, as a more efficient system creates a better working environment. Research indicates that one of the most significant advantages of network convergence – which makes smart buildings possible – is a marked improvement in productivity.

### KEEP IT SIMPLE

Reducing the need for separate networks and realising single platform unification lowers costs associated with equipment, cabling, monitoring and maintenance. Consolidation leads to significant cost savings over time.

Managing a single network infrastructure is far simpler and more cost-effective than dealing with multiple discrete systems. Network administrators can oversee and maintain networks more efficiently, which reduces operational costs and improves

troubleshooting and issue management response times. Network convergence also significantly enhances energy efficiency and sustainability by enabling all equipment within the system to communicate seamlessly. This interconnectedness provides better insight into and control over electrical consumption, leading to improved efficiency and a reduced carbon footprint.

With more people working from home, there is ongoing discussion about the necessity of traditional office spaces. While offices are still needed, the shift towards a more flexible working environment demands that buildings themselves become more adaptable. Managing workspaces efficiently, effectively and securely requires knowing who is in the building – and where they are. Even with a reduced office size, the benefits of automation and convergence in managing these spaces remain significant.

## MAKING IT HAPPEN

SPE technology has been designed to support high-speed data communication over a single twisted pair of wires. Unlike traditional Ethernet, which typically uses four pairs (eight wires) in a Category 6 or Category 6A cable, SPE simplifies cabling infrastructure by reducing it to a single pair. SPE can support various data rates, including 10Mb/s, 100Mb/s and 1Gb/s, whilst providing power using a single pair version of power over Ethernet (SPoE).

SPE allows for a unified communication infrastructure. Data from various sources including sensors, controllers and actuators can be transmitted

over a single network protocol (IP) along with power. Reduced cabling and installation costs make SPE an attractive option for deploying IP networks. Compatibility with existing Ethernet protocols and standards ensures seamless integration with existing networks and devices. Networks can be easily scaled and adapted to new devices and applications.

However, it's important to point out that developing an SPE solution for cost-effective and scalable converged and 'all over IP' networks introduces a few challenges – ensuring reliable data transmission over long distances with minimal signal loss and maintaining compatibility with existing Ethernet standards, for example. You also need to investigate interference and

electromagnetic compatibility and ensure robust cybersecurity.

## PUT INTO PRACTICE

SPE can be implemented in several ways. One approach involves adding a separate SPE network for OT applications in addition to the standard four-pair network for IT. However, this results in two networks instead of one, leading to extra costs, increased management complexity and inflexibility if the network needs to be modified.

The concept of structured premises cabling aims to provide a single network

that supports a wide range of future applications. This requires ensuring that the network can accommodate future OT device requirements, particularly the large number of devices that need to be connected and powered. An alternative approach is to install a single structured cabling system with the flexibility to support these devices. One proposed solution is to run four SPE services

over each of the four pairs in a typical LAN cable, thereby multiplying the capacity by a factor of four to accommodate additional devices.

## CAREFUL PLANNING

By leveraging a unified IP backbone, organisations can achieve greater

**'Managing a single network infrastructure is far simpler and more cost-effective than dealing with multiple discrete systems. Network administrators can oversee and maintain networks more efficiently, which reduces operational costs and improves troubleshooting and issue management response times.'**

efficiency, flexibility and cost savings, while maintaining high standards of communication and security. As demand for connected devices continues to grow, SPE is set to become an increasingly important technology for achieving efficient and reliable network convergence. However, ensuring consistent and reliable service quality can be challenging.

Managing network traffic to avoid congestion, ensure optimal performance and resolve issues across all connected devices and systems is essential. Proper network design and management practices can mitigate the risks of congestion and maintain efficient network operations. Implementing quality of service (QoS) mechanisms to maintain high performance, protecting the network from cyberthreats and ensuring secure transmission of sensitive data are also paramount.

With the increasing number of new devices being integrated into systems, managing infrastructure becomes significantly more complex. As we continue down this path, infrastructure management will become increasingly critical. A properly specified and implemented automated infrastructure management (AIM) solution provides a comprehensive record of ports and panels, and maintains effective monitoring of the cabling and device infrastructure, ensuring optimal performance and reliability.

### SOLUTION PROVIDER

Key issues in implementing converged networks, all over IP networks and SPE include security vulnerabilities, increased complexity, network congestion potential, compatibility with legacy systems, higher initial set-up costs and the need for specialised expertise to manage and

maintain the integrated infrastructure. Each application and location must be mapped and simulated to arrive at the most effective, future ready solution without overspecifying or overpaying! If in doubt, speak to the experts. ■



### RACHID AIT BEN ALI

Rachid Ait Ben Ali has worked in the cable industry for 15 years. After a stint teaching electronics and physics, he joined a French structured cabling brand in 2009 as product manager for racks and copper. He joined Aginode in 2023 as a product solution manager in charge of defining the strategy for smart buildings and data centres.

# Blurred lines

Chris Dyke of Allied Telesis explains the benefits of converged network infrastructures

**▶** A converged network is a unified communication infrastructure that integrates various types of traffic such as data, voice and video into a single, cohesive network. This approach contrasts with traditional networking environments, where separate networks were maintained for different types of services. Over the last decade many applications that might have previously been standalone are now benefiting from being connected. As such, the definition and scope of a converged network are constantly evolving.

## BENEFIT CHECK

If an organisation only needs to design and build a single infrastructure rather than multiple ones, it is going to be more cost-effective upfront, even before considering ongoing costs. Theoretically, a business could invest in a better and faster infrastructure if it only needs to buy one, as opposed to spreading a potentially stretched budget across multiple networks.

This network may not necessarily be defined by the medium used to carry the data such as cabling or Wi-Fi. It is often made up of many technologies including Ethernet, cellular, Bluetooth and others to make a rich multimedia network of connected devices all sharing data to provide the best experience for the user. When looking at business processes, collaboration over the network has become a very valuable tool to most organisations

and, as such, the integration of data, voice and video is a must. Consequently, the network must support this at both the application and physical layers.

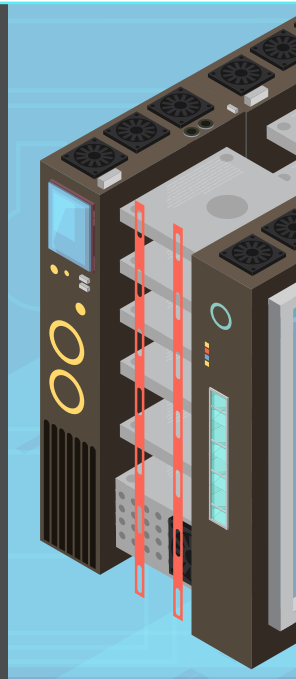
## RISKY BUSINESS

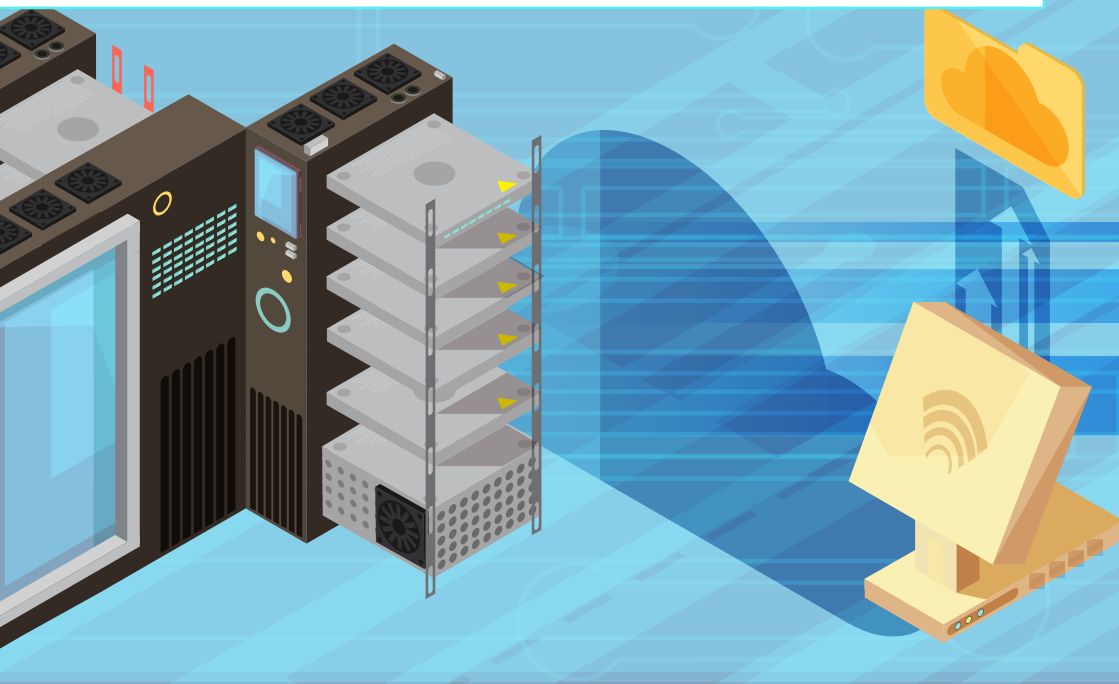
There are risks associated with operating a single converged network though. The first, and most obvious, is that failure of this network is going to affect more people, applications and business processes, so factoring in contingencies against this is important. These could take the form of avoiding single points of failure in hardware, software or the supporting services such as power supplies or cabled connections.

Another important risk to be considered is cybersecurity. If multiple applications are operating on a single infrastructure, then this means that the attack surface is increased, and should an application or server be compromised then this could easily spread to others. The risk of this in disparate networks is greatly reduced as they may be separated by security devices such as firewalls or even completely air-gapped from each other.

## KEPT APART

Some services such as CCTV or access control are often considered too important





to be added to a converged network. Though video delivery from cameras to storage servers (whether in the cloud or on premise) can draw 5Mb/s per camera, most networks have plenty of bandwidth to absorb this requirement without concern. Often security or facility managers will still have a separate network to ensure that these critical services are not impacted by issues with other applications.

Compliance is also another factor affecting the usage of converged networks. For instance, rules governing General Data Protection Regulation (GDPR) define how someone's personal data can be transmitted, stored and accessed using applications such as customer relationship management (CRM) and email, which both carry and store a great deal of user data and must be compliant.

Another application that requires careful consideration is use of credit card terminals on a network, as this technology sends not only personal data but also financial data and keys across the network

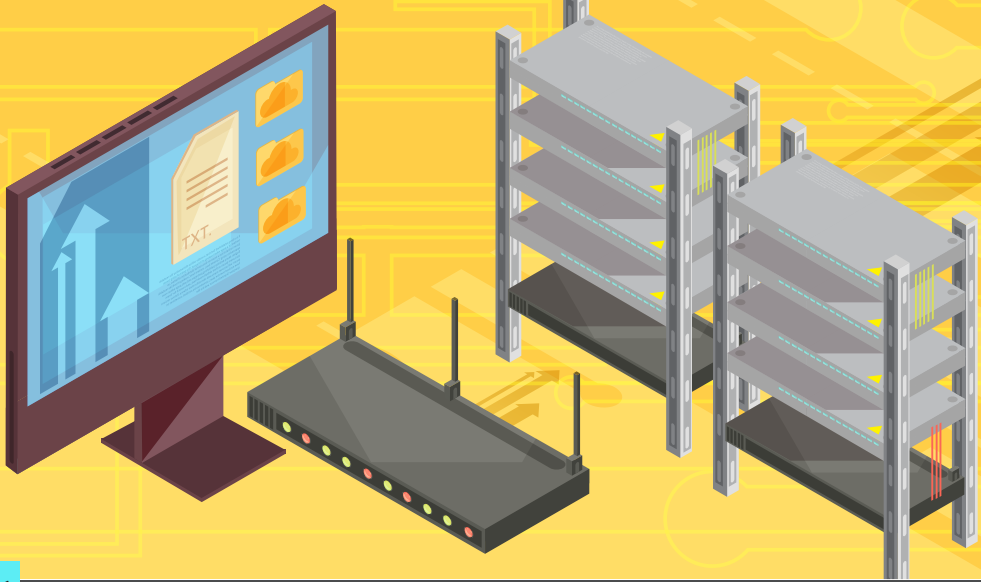
to be processed. If other applications are using the same network as these devices the threat level increases and additional security measures to ensure compliance should be adhered to.

### DRIVING ADOPTION

When networking was in its infancy, many companies' research and development labs were rolling out different technologies such as Token Ring, Fiber Distributed Data Interface (FDDI) and Ethernet, often each operated by different protocols such as IPX, LAT, DECnet and TCP/IP. Each of these had its place but over time it was Ethernet and TCP/IP that matured into the largest players, ultimately creating the Advanced Research Projects Agency Network (ARPANET) and the internet.

Once this foundation was established more new protocols based around them appeared that led us to what we recognise now as converged networks. The first of these was the adoption of virtual local area networks (VLANs), which made it





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extremely easy to create logical networks for different applications over the same infrastructure. Since this was an IEEE standard, all vendors made this function available on their networking equipment.

This was coupled with quality of service

### MORE THAN MEETS THE EYE

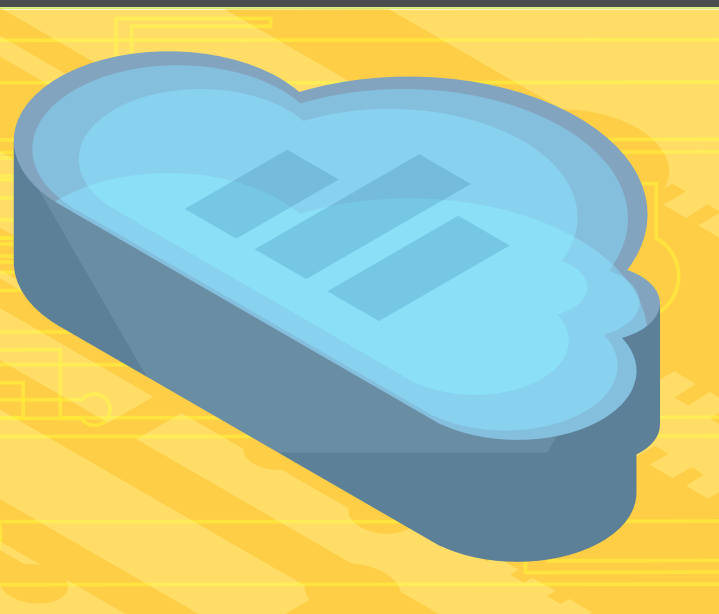
The logical virtualisation that began in networking also extended to servers. Soon organisations that previously had rooms full of servers, each supporting a single application or task, began to be replaced by

‘Converged networks will continue to evolve with advances in data centre, cloud, quantum and edge computing seeing the use of larger and larger datasets. These will, of course, be turned into better information and pattern recognition, and hence new applications will become a reality.’

(QoS) and class of service (CoS), which could be overlaid on the network. Thus, applications could be given priority access, even if the network was congested. Typical examples such as SAP and voice over internet protocol (VoIP) were often high priority, whereas web and email were lower.

fewer, larger, higher performance hardware platforms. These new virtual environments could optimise resources better, providing higher availability of applications, services and licencing.

These new IT infrastructures were quickly adopted by businesses and had the capability to offer an edge over their



or crippled. Nation states and other bad actors will always see these systems as highly attractive targets and the information they hold as a prize that maybe too hard to resist. As businesses continue to adopt and integrate these technologies, converged networks will play a pivotal role in the digital transformation journey. ■

competition, which was highly desirable. Rapid adoption of high-speed wireless and virtual private network (VPN) technology by users and, later, internet of things (IoT) devices and sensors, made these networks more flexible, available and reduced latency. This effectively extended the geographic footprint of a converged network from a single office to a campus and beyond – realistically to anywhere with an internet connection.

### WHAT DOES THE FUTURE HOLD?

Converged networks will continue to evolve with advances in data centre, cloud, quantum and edge computing seeing the use of larger and larger datasets. These will, of course, be turned into better information and pattern recognition, and hence new applications will become a reality. This will need to be tempered with sustainability, regulation, legislation and constantly evolving cybersecurity systems, ensuring that they are not abused



### CHRIS DYKE

Chris Dyke is sales director UK & Ireland at Allied Telesis. He is responsible for supporting new and existing partners to drive customer business and win projects through the partner channel. He has extensive technical and commercial knowledge, gained through over 20 years in the IT industry.

## Secure IT Environments boosts energy efficiency at Isle of Wight NHS Trust's data centre

Secure IT Environments has completed mechanical and electrical upgrades to improve energy efficiency at the primary data centre of St Mary's Hospital, Isle of Wight NHS Trust.

The data centre was originally designed and installed by Secure IT Environments in 2008, but the Isle of Wight NHS Trust wanted to take advantage of new energy efficient and sustainable technologies, whilst also redesigning the data centre to accommodate 14 racks, with a maximum data centre load of 80kW. The upgrade recommendations specified and



implemented by Secure IT Environments will allow the trust to reach its data centre target cooling PUE of 1.15 or lower and is projected to achieve its return on investment in less than 1.8 years.

Works on the data centre included designing a new rack layout to support future load requirements and implementing cold aisle containment.

Four air conditioning units with external condensers were installed alongside a new energy efficient uninterruptible power supply (UPS) solution capable of 40 minutes autonomy at 80kW load.

## Juniper Networks delivers AI native networking at the Università Telematica Internazionale Uninettuno

Juniper Networks and Università Telematica Internazionale Uninettuno have built a new artificial intelligence (AI) native wireless access network for the university's headquarters in Rome. This enables the delivery of superior digital experiences and network performance, while ensuring robust and reliable connectivity.

Università Telematica Internazionale Uninettuno relies heavily on the quality of wireless connections to conduct video and voice calls and seminars, as well as handling data and other business procedures that require online collaboration. It is headquartered

in a historic building, which has posed Wi-Fi coverage challenges in the past. Additionally, located in the centre of Rome,



there was a significant amount of interference to the network.

To combat issues with connections and end user experience, a Juniper Mist wireless access solution was chosen along with Juniper Mist AP32 access points to upgrade the overall network and migrate to an

AI native networking solution managed via the cloud. The transition has greatly improved the overall connection reliability, with lower latency and zero network related connection issues.

## Ruckus Networks provides world-class connectivity experience for Le Royal Monceau – Raffles Paris

Le Royal Monceau – Raffles Paris has successfully completed the upgrade of its Wi-Fi network with the help of Ruckus Networks.

Located near the Champs-Élysées, Le Royal Monceau – Raffles Paris has deployed more than 330 Ruckus access points within its 149 guest rooms, suites and back of house areas, three high-density public area access points in its Katara Cinema, six outdoor access points and two Ruckus SmartZone controllers. The deployment will elevate the guest experience through enhanced connectivity



speeds, low latency, improved security, and increased reliability and capacity. Guests will benefit from robust, reliable Wi-Fi that supports high-density environments.

In addition, the Ruckus SmartZone controller will simplify network management, providing Le Royal Monceau – Raffles Paris' IT team with advanced solutions to optimise performance and swiftly address any issues. This upgrade underscores its commitment to offering a world-class stay, combining luxury with cutting-edge technology to meet the evolving needs of its guests.

### PROJECTS & CONTRACTS IN BRIEF

Indosat Ooredoo Hutchison is celebrating a major milestone in its journey towards digital transformation with the inauguration of its state-of-the-art Digital Intelligence Operations Center (DIOC). This advanced facility represents a significant leap forward in Indosat's commitment to leveraging artificial intelligence (AI) to deliver exceptional service to more than 100 million customers across Indonesia.

Aruba has introduced liquid cooling technology at its data centre campus in Ponte San Pietro, near Milan. The Global Cloud Data Center (IT3) campus, which has been operational since 2017, spans 200,000m<sup>2</sup> and offers a capacity of 60MW.

Vodafone Spain and Telefonica have signed an agreement to form a joint fibre network company in Spain, named FibreCo, covering approximately 3.5 million premises. FibreCo will provide fibre access services to both Vodafone Spain and Telefonica within its footprint.

The UK government is investing up to £800m to enhance broadband infrastructure for 312,000 rural homes and businesses across England, Scotland and Wales. This initiative seeks to bridge the digital divide that has left many remote areas with inadequate internet speeds.

# All you need to know

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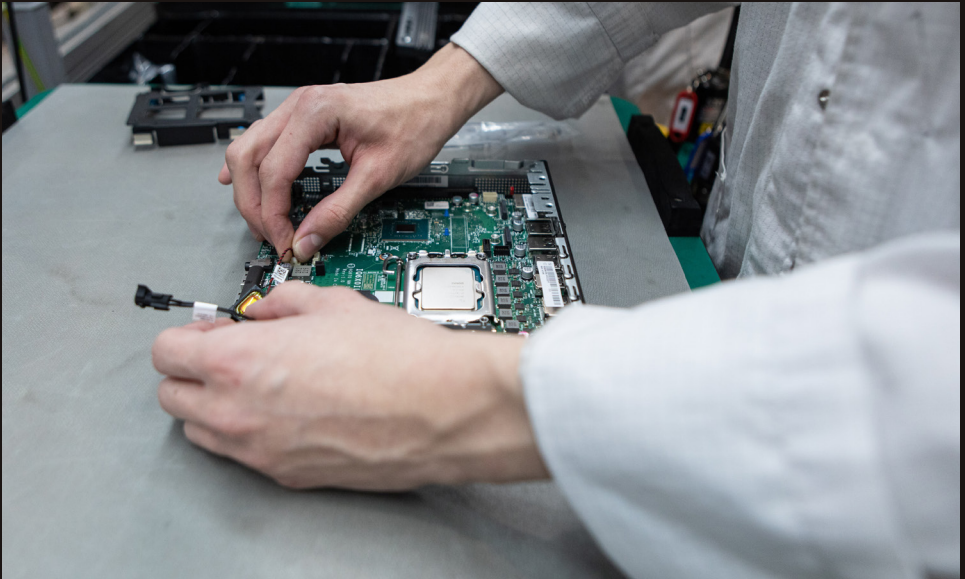
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# Ahead of our time

Ian Jeffs of Lenovo Infrastructure Solutions Group predicts what data centres will look like in 2030



▶ The data centres of 2030 will be very different to the ones that power our society today – built to be smarter, faster and more sustainable. The power demands of data centres are rising rapidly, with Britain's National Grid predicting that the consumption of data centres could rise sixfold in the next 10 years.

## POWER UP

The International Energy Authority (IEA) says that data centres already account for up to two per cent of energy use worldwide and that this could potentially double by 2026, becoming equal to the electricity consumption of Japan. This will drive a huge demand for sustainable

computing this decade. Innovations in data centre technology will help deliver new, sustainable approaches and help organisations achieve carbon neutral or even carbon negative computing.

This exponential surge in electricity demand will be driven in part by new technologies such as quantum computing and, in particular, generative artificial intelligence (GenAI). GenAI is a power-hungry technology – generating just one image uses as much energy as fully charging a smartphone, according to a Carnegie Mellon study this year. But AI also has important roles to play in tackling climate change, addressing challenges such as designing nuclear fusion reactors

for clean energy and limiting methane emissions from waste. Business leaders must find a way to reap the benefits of this technology while limiting its environmental impact.

## GRAND DESIGNS

To design and build data centres fit for the next decade, business leaders need to take a holistic view of their environmental impact. This includes everything from how servers are shipped to the use of renewable energy, as well as technological considerations such as how servers are cooled, and how that energy might be reused. By taking the time to understand the impact of this technology, business leaders can implement it in the most sustainable and intelligent way.

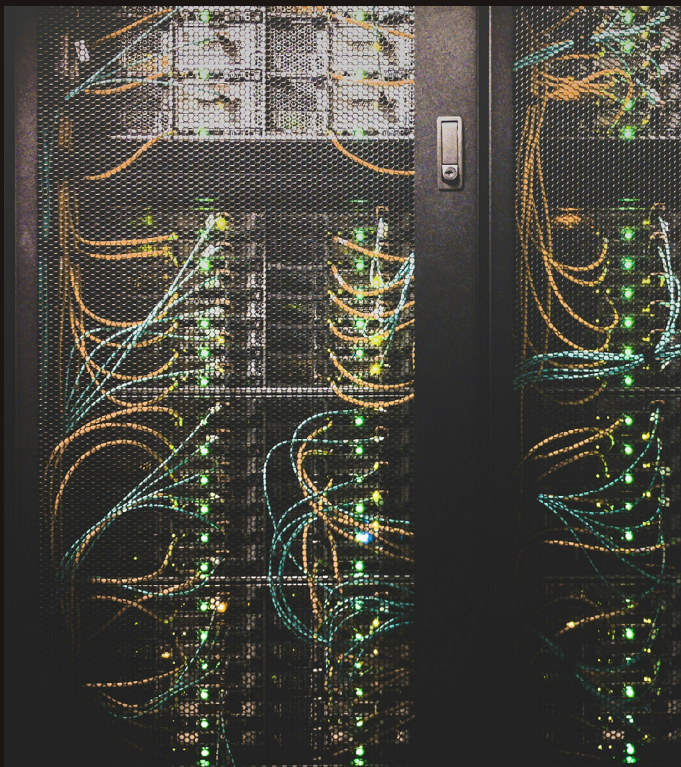
With GenAI appearing in software ranging from email apps to internet searches, the energy demands of the AI industry is going to continue rocketing, with one study in the journal *Cell* suggesting the power demand of AI alone could match the demand of the Netherlands by 2027. The compute power required to train AI doubles every six months and Gartner predicts that 'by 2030, AI could consume up to 3.5 per cent of the world's electricity'. The IEA's report suggests that adding GenAI to search engines (as companies including Google are rushing to do at present) could multiply the energy demands of internet searches by 10.

## FAST AND FURIOUS

All of this requires the technology industry to design

carefully for sustainability, not just at the chip level, but at the server level and data centre level. It's also worth bearing in mind that there is a flipside to this in terms of the environmental benefits of innovations sparked by new technologies.

Emerging technology such as quantum computing will be more energy efficient and this could also mean that problems are solved exponentially faster than traditional computers. Both quantum computing and AI are expected to drive rapid innovation in everything from demand response in the electricity grid to photovoltaics and electricity generation technology. The smart grids of the future will be powered by AI. In building decarbonisation, to take one example, McKinsey estimates that AI can accelerate the process hundredfold compared to existing technologies.



## WASTE NOT WANT NOT

The data centre of the future will be designed from the bottom-up with sustainability in mind. Technologies such as warm water cooling enable high performance with far less energy use – there is much less need for high-speed fans to dissipate heat. Air-cooling systems can often consume vast amounts of energy in themselves.

Furthermore, any wasted heat can be reused effectively because warm water-cooling systems produce heat waste at a temperature that is more easily reused for other purposes. Not only will this improve energy efficiency across an entire data centre facility, but this energy can be successfully recycled in sustainable ways in the wider community. By 2030, recycling the heat from data centres will become the norm, from heating nearby buildings

and swimming pools to piping warm liquid under roads and walkways to melt ice.

The data centres of the future will also be built around renewable energy, driving towards a future of carbon neutral or even carbon negative operations. Organisations will adopt ‘as a service’ approaches to AI to improve efficiency and, increasingly, businesses will harness the power of AI to optimise electricity consumption in data centres themselves. Just as AI will assist in demand response in the electricity grid, within the data centre algorithms can help with optimisation, predictive maintenance and energy management. This can reduce energy consumption by improving cooling efficiency, minimising waste and optimising resource allocation.

## HOLISTIC APPROACH

When designing and building a data centre fit for the future, it’s key for business leaders to take a view across the whole lifecycle of their facility and the servers that will work in it. Everything from how components are designed and manufactured to how they are shipped, deployed and disposed of at the end of their lives matters, and taking a holistic view is key to making real sustainability gains.

Through this decade, asset recovery services and recycling of computer equipment will grow in importance. Manufacturing products regionally to cut shipping miles will also be a key differentiator. The current shift towards ‘as a service’ approaches to everything from hardware to software will continue, with



‘Powered by renewables, the carbon neutral data centre of 2030 will be tightly woven into a local community, providing warmth to buildings and using AI to power the research that will guide the world towards net zero.’





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business leaders focusing on avoiding overprovisioning to cut carbon emissions.

### **A CLEANER FUTURE**

Business leaders will adopt smarter, more sustainable approaches as this decade unfolds, helping to keep pace with AI's hunger for energy. The data centre of 2030 will still look like today's but everything from how resources are allocated to how servers are cooled will have changed. Powered by renewables, the carbon neutral data centre of 2030 will be tightly woven into a local community, providing warmth to buildings and using AI to power the research that will guide the world towards net zero. ■

### **IAN JEFFS**

Ian Jeffs is the general manager of Lenovo Infrastructure Solutions Group in the UK and Ireland, and is focused on driving further growth and excellence for its data centre channel partners and customers. Jeffs rejoined Lenovo in 2020 after 12 years and was part of the first team to establish the PC business in the country after its acquisition of ThinkPad from IBM in 2004. With a career spanning 25 years, Jeffs has been successful in creating thriving sales, marketing and channel businesses in large technology organisations including Tech Data, Arrow and IBM.

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