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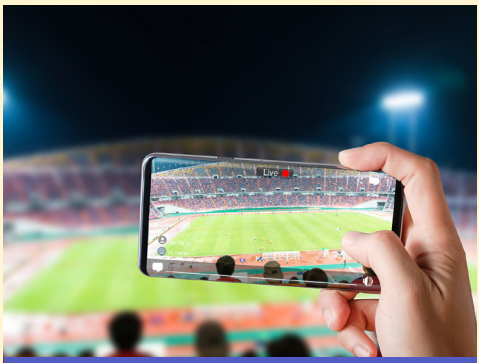

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The end of a year always offers the chance to reflect and look forward to what's ahead. If you're anything like me, 2024 will have gone in a flash and plans for 2025 will be well underway. Before I go any further, I'd like to say a big thank you to our contributors from all over the world who continue to make Inside_Networks what it is and to you, the readers, for choosing it as your monthly resource for all enterprise and data centre network infrastructure news, views, comment and analysis.

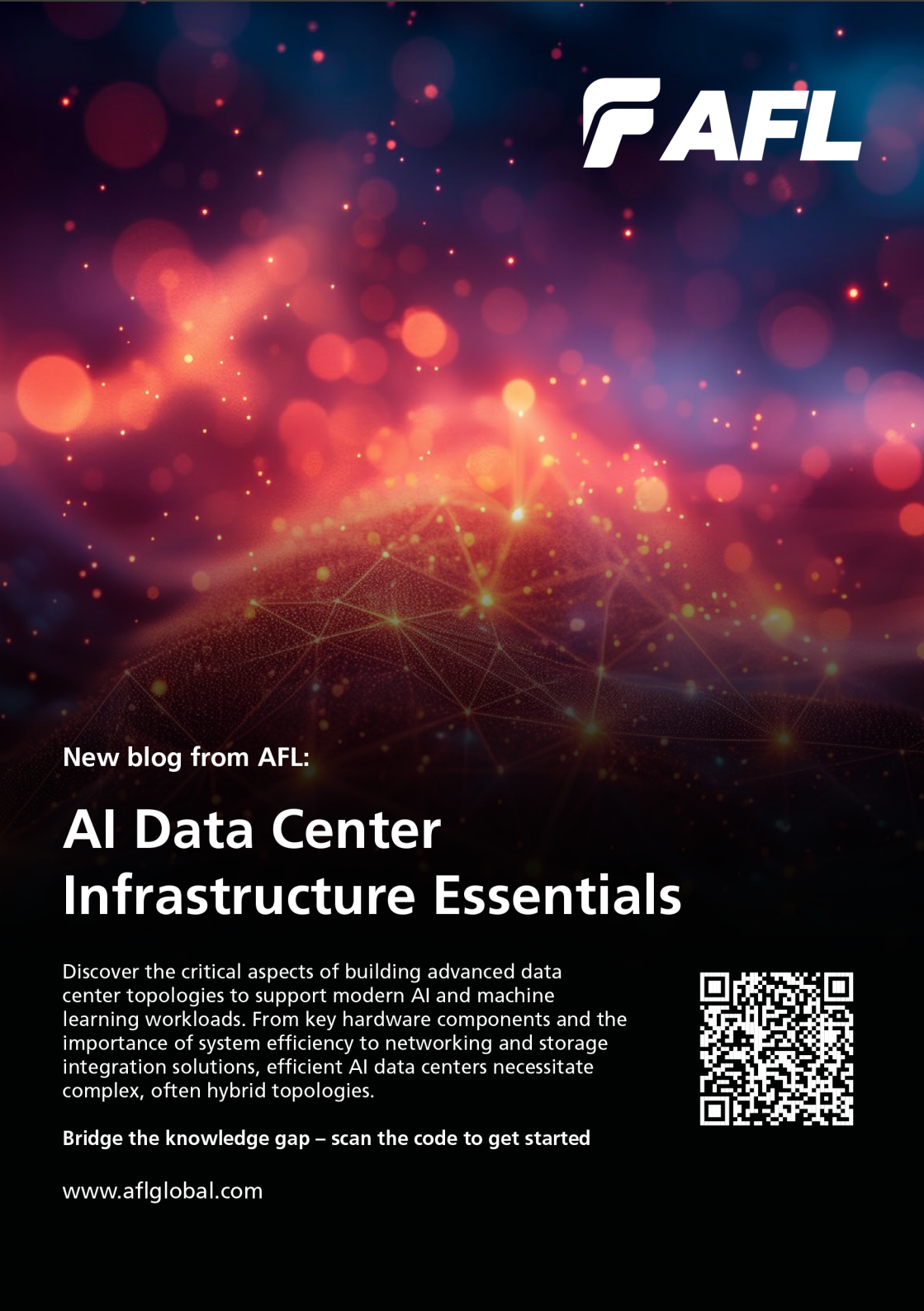
So back to business. 2024 was a positive year for the industry with artificial intelligence (AI) reshaping things and a greater awareness of the role of data centres in society. To sum up the last 12 months and look forward to the year ahead, in this issue's Question Time we've asked a panel of experts from different sectors to pick their highlights and suggest what the future has in store.

When it comes to the industry's unsung heroes, cable management and labelling are certainly amongst them and in this issue we have two excellent articles that will redress the balance. In the first, R&M's Matthias Gerber shares some insights into best cable management practices and he's followed by Richard Cann of Mayflex, who explains why getting the labelling of cabling right first time is increasingly vital.

We also take an in-depth look at what's happening in the world of connectors and connectivity. Manja Thessin of AFL examines the role of advanced connectors in shaping the evolution of AI and high-performance computing (HPC), Piers Benjamin of Corning Optical Communications explains what's involved in establishing a long-reach flexible cabling infrastructure, and Aginode's Rachid Ait Ben Ali looks at how sustainability demands are shaping connector selection and usage.

Finally, on behalf of the Inside_Networks team I'd like to wish you and yours all the best for 2025!

Rob Shepherd
Editor


AFL
New blog from AFL:
AI Data Center Infrastructure Essentials
Discover the critical aspects of building advanced data center topologies to support modern AI and machine learning workloads. From key hardware components and the importance of system efficiency to networking and storage integration solutions, efficient AI data centers necessitate complex, often hybrid topologies.
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Cisco finds companies are less ready for AI than they were last year

Cisco's second annual Readiness Index has explored how prepared organisations are to invest in, deploy and use AI. Nearly 8,000 companies took part, and the report highlights a huge chasm between the urgency companies feel to deploy AI and their readiness to do so.

Nearly all companies (98 per cent) report the urgency to deploy AI has increased in the last year. However, the research found that from 2023 to 2024, global AI readiness in the enterprise has declined. Only 13 per cent of companies today are fully ready to capture AI's potential – down from 14 per cent a year ago.


Jeetu Patel

'Eventually there will be only two kinds of companies – those that are AI companies, and those that are irrelevant,' said Jeetu Patel, chief product officer at Cisco. 'AI is making us rethink power requirements, compute needs, high-performance connectivity inside and between data centres, data requirements, security and more. Organisations need to be preparing existing data centres and cloud strategies for changing requirements.'

Excel Networking Solutions grows its UK Category 6A market share

According to the latest BSRIA World Market for Structured Cabling report, Excel Networking Solutions' share of the Category 6A market has increased to 23 per cent, putting it second in the UK. BSRIA found that over one third of all copper cabling installed was screened, with Excel's portfolio offering a variety of cable designs including options with different levels of shielding.


Simon Jacobs

Simon Jacobs, product manager at Excel Networking Solutions, stated, 'Our Category 6A solutions are a testament to our commitment to innovation and quality. We made the decision many years ago to focus on developing a broad end to end screened offer, as it was clear to us that this was the market's preferred design option. As the market demands higher performance and more reliable networks, Excel is proud to provide solutions that not only meet but exceed these expectations.'

UK positioned bottom of leaderboard for long-term sustainability strategies

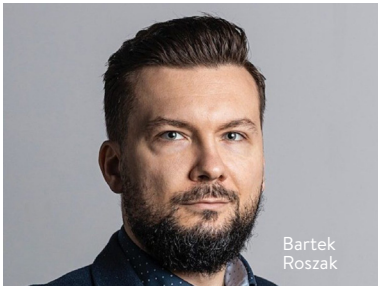

Buddy Bayer

Research from Colt Technology Services has found that only 18 per cent of UK businesses have a multi-year plan to minimise their environmental impact, compared with more than twice as many in the Netherlands (42 per cent) and Hong Kong (41 per cent). Most countries surveyed, however, are still in the early stages of sustainability planning, with 39 per cent about to embark on a multi-year plan.

The research reveals that the responsibility for organisations' environmental strategies is now likely to sit with chief information officers (CIOs), with 71 per cent of those surveyed either having direct roles in shaping sustainability strategies or owning them entirely. 38 per cent say environmental impact and governance drive all strategic digital infrastructure decisions, rising to 60 per cent in Belgium, 52 per cent in the Netherlands and 50 per cent in Hong Kong.

Buddy Bayer, chief operating officer at Colt Technology Services, said, 'It's surprising that more than 80 per cent of the UK businesses surveyed don't have multi-year plans in place to drive sustainability, but I'm encouraged that they are now building their long-term sustainability journeys to drive real change. It's also heartening to hear the positive contribution tech is making towards carbon reduction.'

Avoiding AI pilot purgatory requires full support of the C-suite


Bartek Roszak

Despite being a clear focus for companies across a wide array of industries, it's expected that numerous AI or machine learning initiatives will become stuck in the pilot phase over the next 12 months, with this stagnation commonly referred to as pilot purgatory.

Gartner estimates that at least 30 per cent of generative AI (GenAI) projects will be abandoned after the proof of concept (PoC) phase by the end of 2025, primarily due to poor data quality, inadequate risk controls, escalating costs or unclear use cases. According to Bartek Roszak, head of AI at STX Next, development teams should consider a project's feasibility and potential from the outset to earn the backing of the C-suite and successfully transition from PoC to production.

Roszak said, 'A swathe of companies have rushed to implement GenAI solutions, but the reality is that the bulk of these projects will never come to fruition. Gartner's prediction that 30 per cent will be abandoned looks to be conservative at this stage – this figure is more likely to be around the 75 per cent mark.'

Playtime is over for GenAI with organisations shifting from experiments to investments that drive performance

Research from NTT Data has revealed that 'playtime' is over for generative AI (GenAI). It found that leaders are turning their focus from experimentation to long-term use cases that transform business performance, workplace culture, compliance, safety and sustainability.


Yutaka Sasaki

The study found that almost all leaders surveyed have already invested in GenAI and 83 per cent have established 'expert' or 'robust' GenAI teams. Top use cases for GenAI include personalised service recommendations and knowledge management, quality control, and research and development (R&D)

'GenAI is more than just another tool, it's a transformative force,' said Yutaka Sasaki, president and chief executive officer at NTT Data. 'As we move beyond experimentation, a tension emerges – move too fast and we risk unintended circumstances, move too slow and we fall behind. Getting GenAI right isn't optional.'

New programme for ex-athletes aims to be the winning formula for the future of data centres

A programme designed to provide athletes with the resources and support needed to successfully transition from professional sports into a thriving career within the data centre sector has been launched. It is the result of a partnership between BCS and JLB Search, and it will be spearheaded by ex-England rugby player turned international referee, Holly Wood.

The Athlete Career Transition Programme will see athletes at the end of their professional sporting careers provided with tailored guidance, skills mapping and career opportunities for full time roles at BCS in project management, cost management, quantity surveying, accountancy, business operations and human resources. Athletes that have joined BCS as part of the programme so far include Will Edwards, an ex-England rugby player and Yasmin Campell, a fencer, Egli Kaja, a professional footballer and Mahima Attreya, an international swimmer.


Jim Hart

Jim Hart, CEO at BCS, said, 'This unique programme reflects our determination to find the next generation of senior managers for our fast-growing sector. It has really opened our eyes to this untapped pool of incredible talent, which we believe has a unique skillset that enables them to thrive in business settings, such as teamwork, leadership, adaptability, resilience and discipline.'

Businesses set to outsource security operations due to widening skills gap

Research from Logpoint has found that most UK businesses will soon be outsourcing their security operations. The survey of 1,762 senior decision makers and influencers across Europe found that while 48 per cent manage their security operations in-house versus 52 per cent who use a third-party, 28 per cent intend to outsource over the course of the next two years.

For comparison, in France 65 per cent take an in-house approach while 35 per cent outsource of which 24 per cent intend to outsource. In Germany 77 per cent opt for in-house and 23 per cent outsource and 27 per cent intend to do so. All of these markets are experiencing a swing in favour of outsourcing that will see the practice become equal to or outstrip in-house provision. Key reasons given for the switch include the ability to benefit from external skills and knowledge, cost efficiencies linked to clear and predictable pricing, and effective security management.

'Using a third-party can provide the organisation with access to the latest technology and skilled experts but also enables them to prove compliance through tailored solutions that can meet the requirements of specific regulations,' said Innes Muir, regional manager MSSPs UK, Eire and RoW at Logpoint. 'The expectation is that more regulations will follow suit and make accountability part and parcel of risk management and incident reporting, further driving the shift to outsourcing.'

NEWS IN BRIEF

José María Álvarez-Pallete López has been re-elected as chair and Gopal Vittal is the new deputy chair at the GSMA.

Tech Mahindra has created a Center of Excellence (CoE) powered by NVIDIA platforms to drive advancements in sovereign large language model (LLM) frameworks, agentic AI and physical AI.

The London Internet Exchange (LINX) has appointed Jennifer Holmes as its new chief executive officer. Holmes will replace Kurtis Lindqvist, who shared his resignation with the LINX community earlier this year, as he prepares for his move to new position as president and CEO of ICANN.

MLL Telecom has been approved for the new G-Cloud 14 Framework – the latest version of the UK government's procurement platform for suppliers of cloud hosting, software and support services to the public sector.

UK fibre providers are facing significant operational challenges, with 53 per cent reporting a lack of day-to-day control over their field operations, according to research from Totalmobile.

Colt Technology Services has successfully completed the first-ever 1.2Tb/s wavelength transmission across the Atlantic.

Why AI's regulators must

Hi Rob

Artificial intelligence (AI) tools are fast becoming a core component of any business' strategy – and one of the most powerful areas of deployment is IT security. AI has a key role to play in addressing one of the biggest challenges within current IT security models – human error. From misconfiguration to misunderstanding, in a complex, multi-tiered infrastructure that includes a mix of on premise, public and private cloud deployments and multi-layered networks, mistakes are easy to make.

Hackers are constantly looking to exploit such faults and AI is fast becoming a vital tool in the security armoury, providing companies with a second line of defence by seeking out vulnerabilities. The speed with which AI can identify known vulnerabilities and highlight configuration errors is transformational, allowing companies to both plug security gaps and prioritise areas of investment. It is also being used to highlight any sensitive data within documents that requires protection and provides predictive data management, helping businesses to accurately plan for future data volumes.

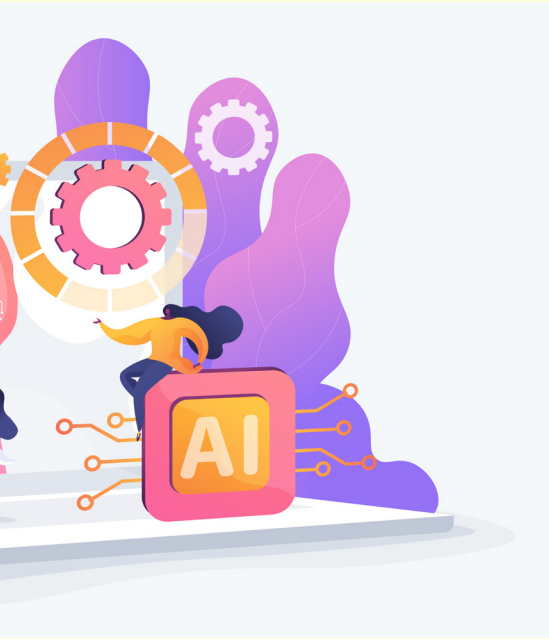
AI is far from perfect though and organisations' inability to impose effective control on how and where AI is used is creating problems. Running AI through internal data resources raises a raft of issues, from the quality and cleanliness of the data to the ownership of the resultant AI output. Once a commercially available AI tool has viewed a business' data, it can never forget it. Since it can access sensitive corporate data from sources such as a company's SharePoint sites, employee

OneDrive storage, even Teams chats, commercially sensitive information can be inadvertently lost because those using AI do not understand the risk.

Gartner has urged caution and stated, 'Using Copilot for Microsoft 365 exposes the risks of sensitive data and content exposure internally and externally, because it supports easy, natural-language access to unprotected content. Internal exposure of insufficiently protected sensitive information is a serious and realistic threat.'

Any business using AI needs to gain far more clarity regarding data exposure. Can data be segregated to protect business interests without undermining the value of using AI or inadvertently undermining the quality of output by providing insufficiently broad information? Once used, who has

prioritise innovation



access to those findings? How can such insight be retained internally to ensure confidentiality?

Business leaders are calling for AI regulation but, as yet, there is no consensus as to how that can be achieved, or who should be in charge. Is this a government role? If each government takes a different approach the legal implications and potential costs would become a deterrent to innovation.

Perhaps the approach used to safeguard the internet should be extended to AI, where key policy and technical models are administered by the Internet Corporation for Assigned Names and Numbers (ICANN). Do we need AI licenses that require AI certified individuals to be in place before a business can run any AI tool across its data? Or simply different licensing models for AI tools that clarify data ownership, for example, by using a tool within its own tenants within a client account to reduce the risk of data leak? The latter would certainly be a good interim stopgap but, whatever regulatory approach is adopted it must be led by security engineers – impartial individuals who understand the risks – and who are not influenced by potential monetary gain.

There are many options and changes will likely result in a drop in income for AI providers. But given the explosion in AI usage, it is time to bite the bullet and accept that getting the right solution can be uncomfortable. It's imperative to quickly determine the most efficient approach that is best for both the industry and for businesses – an approach that accelerates innovation, while also protecting commercially sensitive information.

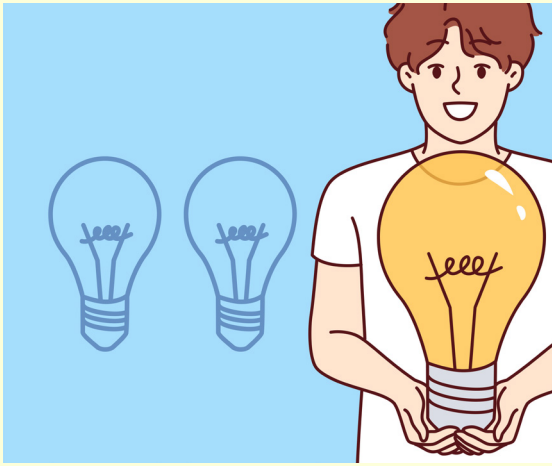
Mark Grindey
Zeus Cloud

Editor's comment

AI holds immense potential to revolutionise business operations, enhancing security, productivity and decision-making. As Mark clearly illustrates, many companies are rushing to adopt these innovations without fully understanding or managing the associated risks. This unregulated enthusiasm can lead to unintended consequences including ethical breaches, data privacy issues, security vulnerabilities and biased decision-making. The complexity of AI systems also introduces operational risks that may go unnoticed.

Knowledge is power for en

Hi Rob



These days, swift network analysis and troubleshooting are essential for monitoring complex hybrid cloud environments. The hybrid cloud market is estimated to grow from $129.68bn in 2024 to $352.28bn by 2029 – a strong indicator of the growth and change of enterprise networks.

Knowing what's happening across an organisation's networks is vital for mitigating risks and optimising business efficiency. However, being aware of the current network management trends in terms of how enterprises are adapting their approaches and technology investments can help to deliver true business resilience. With this combined insight, network decision-makers can make more informed network solution investments that deliver robust operations and maintain optimal performance levels.

In response to the challenges presented by growing networks, network operations teams have turned things around and see themselves as more successful. Even more encouragingly, much of the enthusiasm is coming from the network admins, engineers and architects. However, some underlying problems remain, as network management toolsets remain bloated, fragmented and noisy. In addition, IT organisations are struggling more than ever to hire skilled network engineers and architects.

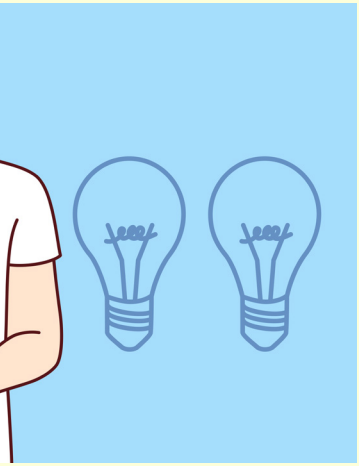
The Network Management Megatrends 2024 report from Enterprise Management Associates (EMA) highlights some of the key drivers of IT initiatives impacting network management. Among them are public cloud migration, software as a service (SaaS) application adoption and DevOps and CI/CD frameworks.

The report identifies the key priorities for network professionals – network security, hybrid and multi-cloud networking, network automation and network observability. Ultimately, network teams care most about security risk reduction, network visibility and end user experience.

Successful network teams are replacing ineffective network management tools, with 93 per cent of IT organisations using, or planning to use, a synthetic network monitoring tool. This is primarily to improve observability of SaaS applications, public cloud infrastructure and internet-based WAN connectivity.

Regarding the impact of artificial intelligence (AI) on this sector, network professionals are embracing AI and machine learning technology to optimise tools, automate operations and enable lower skilled personnel to take on more responsibility. 64 per cent of network teams have adopted AI features their

nsuring business resilience



network management tools offer, primarily to improve security threat detection and automate network problem remediation processes.

The EMA research revealed that 46 per cent of network teams are modernising networks as much as possible, having fully implemented a cloud-based secure access service edge (SASE) solution. SASE simplifies the management of network security and supports dispersed users.

Teams are opting for integrated collaboration tools or workflows, mapping and data visualisation and a task- or workflow-oriented user interface. In general, IT professionals believe better network management tools could help prevent nearly 53 per cent of their network issues.

The vast majority (93 per cent) of IT organisations are using or planning to use a synthetic network monitoring tool, primarily to improve observability of SaaS applications, public cloud infrastructure and internet-based WAN connectivity. More than half (65 per cent) of network teams also prefer to operate their management tools as a SaaS service. Network managers can gain visibility into their multi-cloud and hybrid networks by following these four steps:

- Adopt synthetic network monitoring to improve holistic observability.
- Focus on improving network security at all stages of network operations.
- Embrace AI and machine learning technology to optimise tools, automate operations and enable lower-skilled personnel to take on more responsibility.
- Modernise their networks with SASE and multi-cloud networking solutions.

By understanding the key trends shaping network operations strategy, network managers can employ the most effective methods and network solutions to broaden visibility into their hybrid and cloud environments.

Filip Cerny
Progress

Editor's comment

IT professionals are under more pressure than ever and, in addition to mitigating risks and enhancing business efficiency, they must quickly identify and address security threats. As Filip states, understanding what's happening within an organisation's networks is essential and real-time insights into network performance and activity reduces the potential for costly data breaches or disruptions. The good news is that SASE is the foundation upon which organisations can support the integration of disparate technologies and harness the full power and potential of digital, data and technology.

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Back to the future

With the end of 2024 in sight, it's a good time to review the events of the last 12 months. Inside_Networks has assembled a panel of industry experts to pick their highlights and suggest what 2025 might have in store

2024 has undoubtedly been the year of artificial intelligence (AI). As it gains traction it continues to pose some serious questions about how data centres are powered and how the rise in computing power through server and graphics processing unit (GPU) architectures will reshape the design, build and operation of these facilities. The role of renewables, microgrids and small modular reactors is therefore being heavily discussed.

There is also the related issue of how AI will inevitably strain traditional air-cooling systems. As a result, data centre operators are pivoting towards cooling solutions such as immersion or liquid as rack densities increase. Although it allows for better heat dissipation and improved efficiency, liquid cooling is not yet widespread, and tends to be limited to specialist facilities or areas within existing facilities.

All of this is happening just as regulatory requirements to reduce carbon emissions became mandatory, with the Energy Efficiency Directive (EED) and Corporate Sustainability Reporting Directive (CSRD) coming into effect. Up until quite recently the data centre sector enjoyed a relatively benign regulatory environment but that's all changed and there will be no going back.

With edge, quantum networking and the ongoing skills shortage also making headlines, Inside_Networks has assembled a panel of experts to discuss the happenings of 2024 and predict the big talking points of 2025.

CLINT SHERRATT

HEAD OF TECHNICAL DEVELOPMENT AT CNET TRAINING

There have been significant developments over the past 12 months, driven by the increasing demand for high-performance computing, AI, increased bandwidth and sustainability. According to Uptime Institute's 2024 Global Data Centre Survey, many data centres are focusing on enhancing energy efficiency, managing staffing shortages, upskilling staff and addressing the complexities of hybrid cloud environments.

One of the most notable trends has been the gradual increase in rack densities, which has significant implications for power distribution and heat dissipation. The average power density per rack is steadily increasing. While the most common rack densities remain below 6kW, many operators are deploying racks exceeding 6kW to support more intensive workloads. Recent customer conversations have mentioned planning and installing individual racks of 136kW and modular pods (12 racks) of 60kW per rack. This trend is expected to continue.

Higher rack densities require more power and traditional power distribution systems may struggle to keep up. Advanced power solutions such as direct current power and medium voltage distribution are being explored, with research into small modular reactors and on-site renewable energy production. These systems could provide more flexibility, scalability and adaptability.

Managing the heat generated by densely packed servers will become increasingly difficult. Operators are turning to more advanced cooling technologies such as direct liquid cooling, air-assisted liquid cooling and immersion cooling. These systems are more effective at dissipating heat and can help reduce energy consumption, aligning with the industry's push towards sustainability and the regulatory requirements designed to drive down Power Usage Effectiveness (PUE), which has stubbornly remained at an industry average of around 1.5.

For 2025 the key focus areas will likely include:

- Adapting to the challenges of higher rack densities.
- Stricter regulation. The need for better PUE will drive investments into green technologies and more efficient designs.
- Greater adoption of AI-driven systems to improve energy consumption and cooling efficiency.
- Balancing the implementation of new systems with maintaining current workloads, with discussions already around having two types of data centre – low density 'workhorses' and high-density 'specialists'.

'ACCORDING TO UPTIME INSTITUTE'S 2024 GLOBAL DATA CENTRE SURVEY, MANY DATA CENTRES ARE FOCUSING ON ENHANCING ENERGY EFFICIENCY, MANAGING STAFFING SHORTAGES, UPSKILLING STAFF AND ADDRESSING THE COMPLEXITIES OF HYBRID CLOUD ENVIRONMENTS.'

CINDY RYBORZ

MARKETING MANAGER DATA CENTRES EMEA AT CORNING OPTICAL COMMUNICATIONS

While adoption hasn't accelerated in the manner that some may have predicted in 2023, we're already starting to see the impact of generative AI on the sector.

From an infrastructure perspective, we're seeing a significant evolution of the typical spine-and-leaf network design, which is favoured for high-speed network performance in data centres that experience more east-west traffic. In addition to a huge increase in the amount of optical fibre that is required, the complexity from a cooling and energy perspective has also increased greatly.

Unlike traditional data centres, fibre is now often taken all the way to the graphics processing unit (GPU) network interface card (NIC) itself, using an additional network layer called the back-end network, which facilitates machine-to-machine communication during the training process. This has increased the amount of connectivity from device to device by about 10 times per rack.

Looking forward, it's well-documented that the advent of AI in the data centre will require further innovations in connectivity, bandwidth and processing power to support the heavy demands of AI workloads. It's also expected to require the development of many new data centres, which this year were classified as critical national infrastructure for the first time in the UK.

For enterprises looking to deploy or grow their AI capabilities, there will be some key decisions to make in 2025 and the industry will need to remain agile and open to adopting new methods. This ranges from the choice of design and specialised components, to the location to maximise energy efficiency.

For data centre operators, we could see an acceleration in the number of facilities that make the transition towards 800Gb/s. Many enterprises are currently operating on 40Gb/s or 100Gb/s but bandwidth demands are increasing and, with sales of 400Gb/s and 800Gb/s transceivers already on the rise, we will see the early deployments of 1.6Tb/s network speeds using 2x800Gb/s combo transceivers in 2025. It's beneficial to be prepared now, rather than having to upgrade later under time pressure.

'MANY ENTERPRISES ARE CURRENTLY OPERATING ON 40GB/S OR 100GB/S BUT BANDWIDTH DEMANDS ARE INCREASING AND, WITH SALES OF 400GB/S AND 800GB/S TRANSCEIVERS ALREADY ON THE RISE, WE WILL SEE THE EARLY DEPLOYMENTS OF 1.6TB/S NETWORK SPEEDS USING 2X800GB/S COMBO TRANSCEIVERS IN 2025.'

NICK TAYLOR

TECHNICAL SALES DIRECTOR AT NETWORKS CENTRE

The integration of AI clusters into both on-premise and off-premise data centres is, and will continue to be, the most significant development in the coming years. However, this shift presents unique challenges due to the substantially higher power and cooling requirements associated with AI workloads.

Traditional air-cooling methods, while effective for heat loads up to 30kW, cannot support some AI deployments that often exceed 100kW. Rear-door heat exchangers (RDHx) can extend cooling capacity, in some cases to up to 200kW. For even more demanding workloads, hybrid cooling solutions combining air and direct to chip cooling, or even immersive cooling, may be necessary.

Existing data centres, designed for lower heat loads, may require significant modifications to accommodate AI clusters. Issues such as insufficient rack spacing, cooling topology and floor load capacity can hinder the deployment of RDHx and immersive cooling systems. Nevertheless, by designating specific areas within data centres for AI workloads, these challenges can be addressed.

Network connectivity is another critical consideration. While point-to-point cabling can be appropriate for certain AI deployments where expansion isn't required, the growing commercialisation of AI applications necessitates more flexible solutions. Leading structured cabling system manufacturers are actively collaborating with AI hardware providers to develop optimised cabling strategies.

It is expected that the adoption of very small form factor (VSFF) connectors and angled MPOs for multimode optical fibre will significantly increase and take market share outside of AI deployments. It could possibly become the de facto choice across the industry. Another pressing concern is the availability of sufficient power, as demand for new data centres already exceeds supply in many regions.

The design of data centres must evolve to meet the demands of AI clusters. Power, cooling and connectivity requirements will diverge significantly from current standards, even for data centres supporting what are currently considered to be higher heat loads.

'WHILE POINT-TO-POINT CABLING CAN BE APPROPRIATE FOR CERTAIN AI DEPLOYMENTS WHERE AND EXPANSION ISN'T REQUIRED, THE GROWING COMMERCIALISATION OF AI APPLICATIONS NECESSITATES MORE FLEXIBLE SOLUTIONS. LEADING STRUCTURED CABLING SYSTEM MANUFACTURERS ARE ACTIVELY COLLABORATING WITH AI HARDWARE PROVIDERS TO DEVELOP OPTIMISED CABLING STRATEGIES.'

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JOHN KREYLING
MANAGING DIRECTOR UK AT CENTIEL

In the past year, AI has been rapidly adopted across different everyday applications. It is already having a massive impact. Power density is the main issue for data centres and mindsets will need to change about how infrastructure must adapt to accommodate higher power needs within limited spaces.

It's already a big discussion point, as AI has arrived on the scene so quickly, however, we simply don't have all the answers about how to move forward yet. Therefore, 2025 will be around how to solve this challenge in relation to the whole infrastructure within data centres. Where will the necessary power come from? How will the overall design be impacted and what needs to be improved – and how?

An example of adopting a design change relating to uninterruptible power supplies (UPS) is utilising this technology to provide other services beyond critical power protection. We are already seeing how UPS can support peak shaving, where facilities can actively use their own energy storage to save costs during peak times of demand on the national grid. However, UPS batteries have the potential to do more to support grid energy and looking at how to implement this practically to help solve power availability issues with an increasing unstable grid will also need to be debated in detail.

The big risk is that the steps organisations have taken towards improving sustainability in recent times will suddenly be overshadowed by the need to focus on more power for AI. Climate change may be responsible for the growing number of severe weather events such as the catastrophic Storm Milton in Florida, so it is imperative we all continue to play our part in developing solutions which proactively reduce environmental impact.

While technology and manging the advancements and data associated with AI may be the bigger talking point, future product development must also focus on sustainability. We must not lose sight of this in the face of an increasingly worrying environmental situation.

'AI HAS ARRIVED ON THE SCENE SO QUICKLY, HOWEVER, WE SIMPLY DON'T HAVE ALL THE ANSWERS ABOUT HOW TO MOVE FORWARD YET. THEREFORE, 2025 WILL BE AROUND HOW TO SOLVE THIS CHALLENGE IN RELATION TO THE WHOLE INFRASTRUCTURE WITHIN IN DATA CENTRES.'

CHAD MCCARTHY
CO-FOUNDER & CTO AT NLIGHTEN

Data centre energy metrics and how to extend them to provide more balanced, fit for purpose solutions for calculating energy usage efficiency have been subjected to closer scrutiny this year. Consequently, several existing measures are being revised to include sector coupling initiatives as part of the energy transition – heat export, in particular.

For example, revisions to the EU Energy Efficiency Directive and the ISO 3134 standard are currently in progress, fathoming how best to factor the use of the heat pumps necessary for raising temperatures to suitable levels, together with the associated cooling implications. Exactly how these will be treated in the final calculations and where the lines between data centre and energy customer will be drawn is still being determined but we think will become clear in 2025.

Considering the impact AI is already having on power to rack densities and the increased energy required for cooling, the growing requirement for more holistic, integrated data centre energy efficiency and carbon usage reporting is no coincidence. These demanding high-performance computing environments bring into focus new scoring metrics that can not only precisely account for the energy being consumed but also produced by the data centre from a heat export/reuse perspective.

Looking into 2025, the power availability challenges and constraints we have witnessed during 2024 in the primary Frankfurt, London, Amsterdam, Paris and Dublin (FLAP-D) markets will continue to fuel the trend towards more decentralised regional data centre models, with sites being in underserved markets where suitable power is readily available. Compared to larger centrally located data centres, their moderate power consumption, distributed grid stabilising potential and compatible scale with local heat reuse initiatives are also major drivers.

These attributes and the growing demand for low latency for supporting internet of things (IoT) and AI inference workloads, content delivery networks and cloud service provision, will make edge data centres increasingly attractive to all stakeholders involved. This includes enterprise users, network operators, city councils, planners, economic development agencies and energy providers.

> ‘THE POWER AVAILABILITY CHALLENGES AND CONSTRAINTS WE HAVE WITNESSED DURING 2024 IN THE PRIMARY FLAP-D MARKETS WILL CONTINUE TO FUEL THE TREND TOWARDS MORE DECENTRALISED REGIONAL DATA CENTRE MODELS.’

JON HEALY
CEO AT KEYSOURCE

Over the past year, the enterprise and data centre network infrastructure sectors have experienced significant advancements. Organisations are increasingly focused on consolidating outdated IT systems to enhance efficiency and meet sustainability goals. At the same time, they are optimising their hosting strategies, making the most of existing investments in cloud or third-party service providers.

We're also seeing a shift in perceptions around cloud services emerging. While cloud solutions remain integral, many enterprises are now recognising their cost implications. This has led to a more strategic approach to distributing services across platforms, balancing cost-effectiveness with the need for reliable performance.

As data transfer volumes continue to rise, it's evident that the future proofing of both WANs and LANs is becoming essential. This aligns with ongoing efforts to modernise legacy IT infrastructure, ensuring that current and future service demands are met, while improving cybersecurity. Cybersecurity will remain a priority, with a focus on advanced threat detection, zero trust architectures and securing increasingly distributed networks. Sustainability will likely continue to gain importance as enterprises look for innovative ways to reduce the environmental impact of their IT infrastructure, while maintaining performance.

We're also seeing geographical factors and real estate costs play a pivotal role in shaping decisions around data hubs. Enterprises are increasingly seeking to comply with updated data sovereignty regulations, while simultaneously minimising property expenses.

Looking ahead to 2025, AI integration is expected to dominate industry discussions. Companies will likely weigh the benefits of AI-as-a-service (AIaaS) against the development of private environments. Meanwhile, the balance between cloud adoption, on-premises solutions and hybrid models will evolve further, driven by a focus on cost-efficiency and operational optimisation.

Finally, edge computing is poised to play a significant role in supporting internet of things (IoT) deployments, while reducing latency for critical applications is likely becoming a key topic in the coming years.

'AS DATA TRANSFER VOLUMES CONTINUE TO RISE, IT'S EVIDENT THAT THE FUTURE PROOFING OF BOTH WANS AND LANS IS BECOMING ESSENTIAL. THIS ALIGNS WITH ONGOING EFFORTS TO MODERNISE LEGACY IT INFRASTRUCTURE, ENSURING THAT CURRENT AND FUTURE SERVICE DEMANDS ARE MET, WHILE IMPROVING CYBERSECURITY.'

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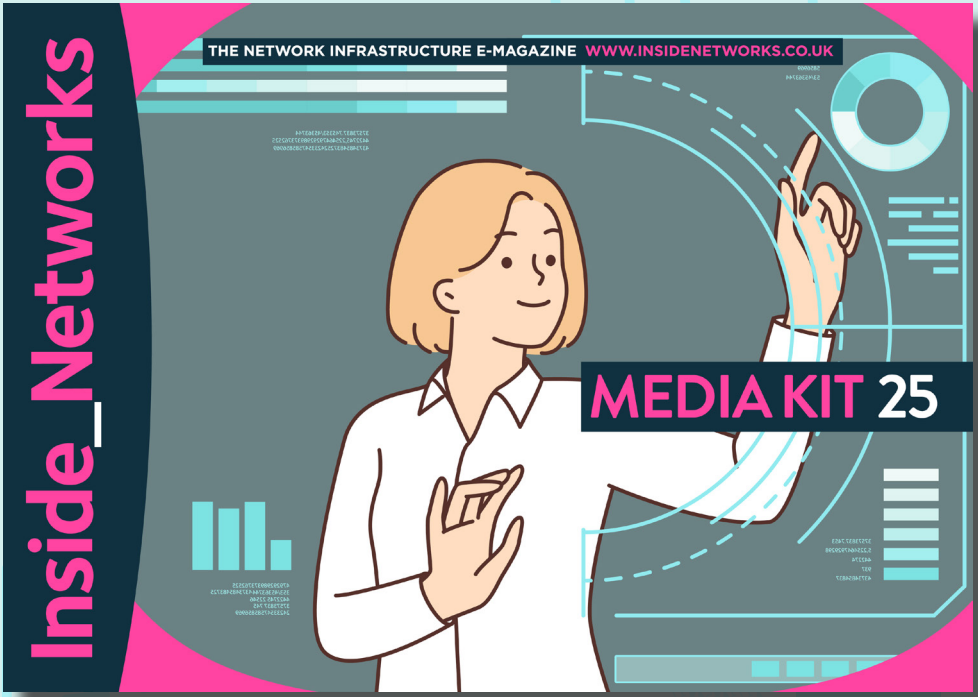

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ANDY HIRST

MANAGING DIRECTOR CRITICAL INFRASTRUCTURES AT SUDLOWS

There have been many exciting projects delivered and a lot of interesting conversations taking place in the last 12 months. However, it strikes me that there has been an onslaught of discussion focused on AI.

Although the terminology and technology has been around for several years, buzzwords such as quantum computing and supercomputer are at the forefront. In parallel with the high-density computing required by AI, there is also an urgency to understand the immersion and on chip cooling solutions that are expected due to the projected densities of these AI needs.

UK government funding of £1.3bn was due to be released for assistance with this. However, to the disappointment of a lot of organisations, this funding was stopped following the change of government. It has been likened to the impact of pausing the rail industry in the 19th century. However, it should be only a matter of time before this is back on track, as the UK surely won't want to fall too far behind in the global AI race.

The delay in the government funding, although not positive for the UK's race to AI in the data centre market, or the economy, should mean that 2025 will be an interesting year to track how this all progresses. What it will do is give additional time for manufacturers of this technology to ensure it is ready to be deployed seamlessly, and consultants will have time to ensure all aspects of the designs are optimised.

More importantly, breathing space is required for end-users and government organisations that are looking at higher density supercomputing. This will ensure that they understand the densities they are looking at for their specific needs, and exactly what type of cooling is best for them.

At present, in some concept design meetings, several organisations – I will caveat not all – are even wanting to start construction without knowing the type of computing they are looking at deploying, as well as the density and, ultimately, footprint required. This can be challenging at concept stage and lead to wasted time if the density or footprints are over specified just to 'play safe'.

So as time progresses, certainly through 2025 and beyond, there will continue to be further talks within the industry between suppliers of these technologies, consultants and, of course, the enterprise and data centre network infrastructure sectors.

'IN SOME CONCEPT DESIGN MEETINGS, SEVERAL ORGANISATIONS – I WILL CAVEAT NOT ALL – ARE EVEN WANTING TO START CONSTRUCTION WITHOUT KNOWING THE TYPE OF COMPUTING THEY ARE LOOKING AT DEPLOYING, AS WELL AS THE DENSITY AND, ULTIMATELY, FOOTPRINT REQUIRED.'

Plugging into the future

Manja Thessin of AFL examines the role of advanced connectors in shaping the evolution of artificial intelligence (AI) and high-performance computing (HPC)

With AI workloads expected to grow 25-35 per cent annually through 2027, the demand for efficient data centre infrastructure is more critical than ever. These advanced technologies require unprecedented data transfer rates and low latency, pushing the limits of traditional connectivity solutions.

FIRST THINGS FIRST

As high-volume, complex AI and HPC workloads involve unprecedented data transfers, the industry must prioritise the reliability – and maintainability – of the cables and connectors constituting the fabric of high-performance optical fibre data centre networks. Failure to prioritise advanced connector and connectivity solutions can lead to significant performance bottlenecks, increased downtime and, ultimately, competitive disadvantage in the rapidly evolving AI landscape.

With data centres moving towards 400 and 800 Gigabit Ethernet to support AI workloads, the role of high-performance connectors becomes increasingly important. This article explores key aspects of AI data centre connectivity, with a focus on structured cabling best practices, advanced connector designs, and important maintenance techniques to ensure optimal high-density optical fibre networks.

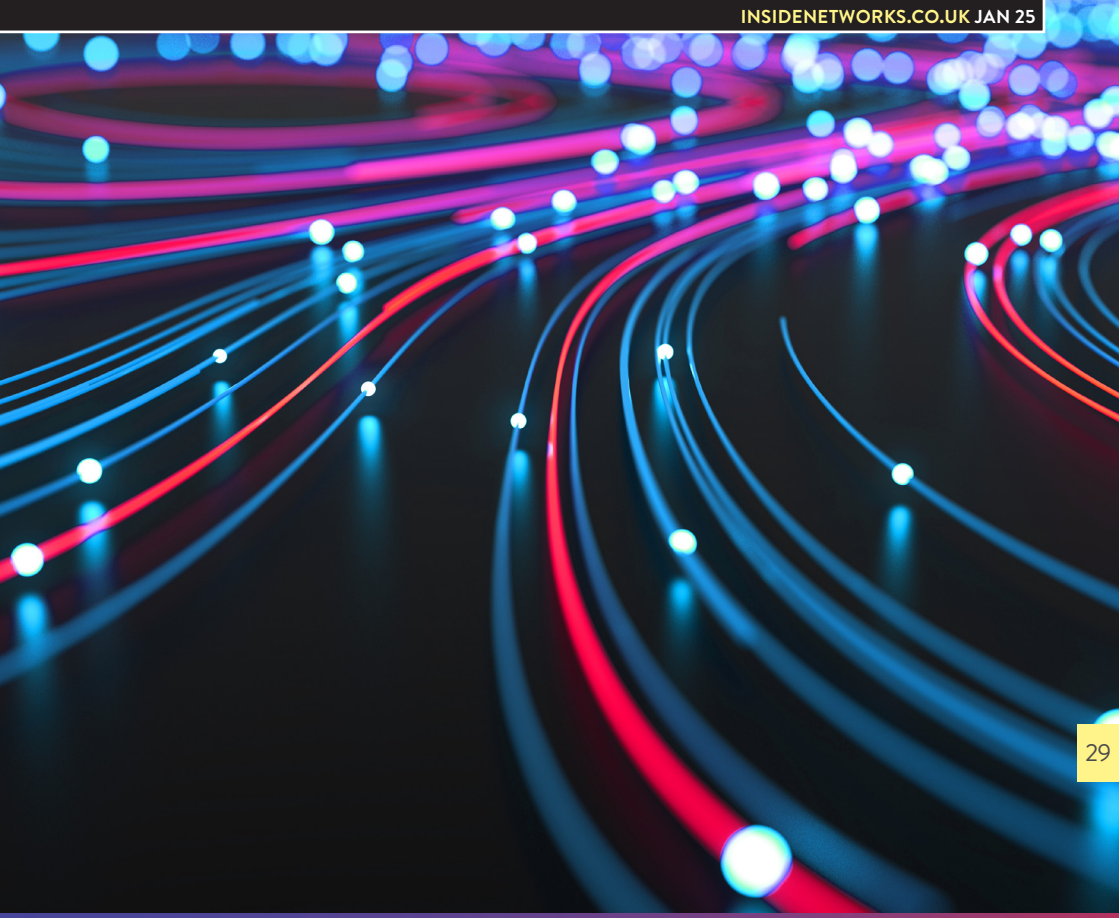
BUILDING BLOCKS

Ensuring connection reliability across high-density optical fibre networks lays the foundations for seamless AI and HPC data centre operations. Performance within these high-density environments relies on efficient connections between components to manage massive data set transfers with minimal latency. However, maintaining these networks presents unique challenges, such as:

- Managing physical space and cable organisation in dense environments.
- Ensuring signal integrity and minimising loss across complex fibre pathways.
- Scaling network capacity to meet the exponential growth of AI and HPC workloads.

POINTS TO CONSIDER

High-density fibre connectivity in AI and HPC environments presents data centre operators with unique challenges. The vast volumes of data involved in complex AI workloads requires meticulous infrastructure planning. Managing physical space within data centres enhances the effectiveness of white space, cabling and



cooling solutions – all of which contribute to the efficient flow of data with minimal congestion, even at peak demand for resources.

Structured cabling solutions can involve streamlining connections by deploying patch panels and high-fibre count trunk cables. Implementing structured cabling systems significantly reduces bottlenecks and minimises clutter to enhance data centre manageability. Proper cable management should include correct labelling and up-to-date system documentation. These practices prevent confusion and potentially reduce downtime during routine data centre maintenance, especially during shift handovers.

Regular audits help identify potential cabling and connector issues throughout data centre infrastructures, allowing engineers to address problems before they escalate into significant downtime. Efficient test and inspection methods should therefore form the backbone of data centre connector maintenance.

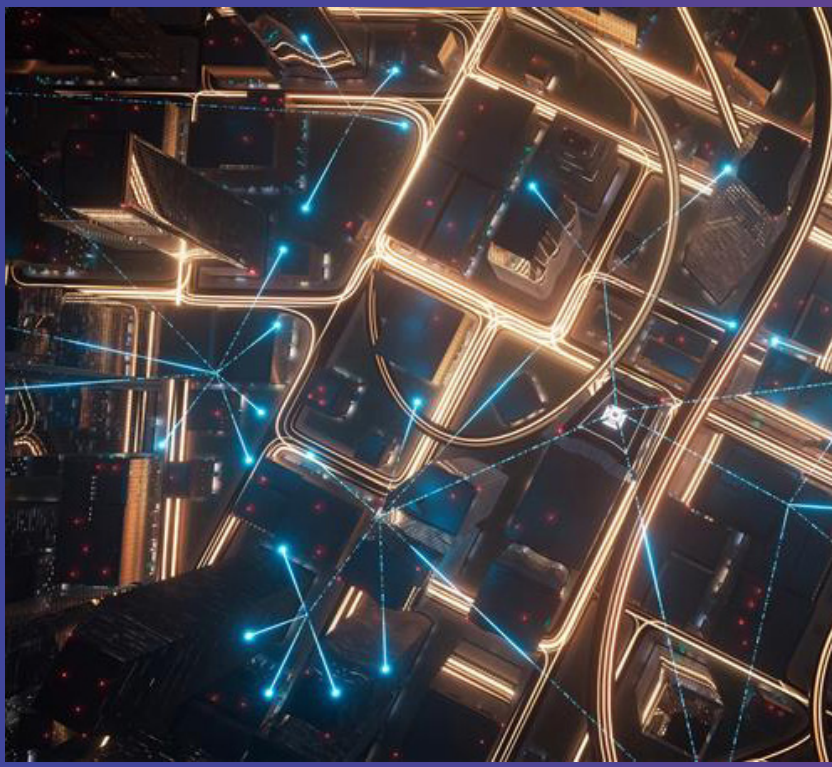
OPTIMAL PERFORMANCE

AI and HPC data centre performance depends on the integrity of optical fibre connections. Contamination within connectors or damage caused during moves, adds and changes can lead to signal loss and increased error rates. Inspection tools such as one-click cleaners and single-ended test kits can accelerate test and inspection times, providing clean connectors and measuring insertion loss across singlemode and multimode fibre

'As data centres move towards 400 and 800 Gigabit Ethernet to support AI workloads, the role of high-performance connectors becomes increasingly important.'

networks. Regular cleaning and inspection can prevent up to 80 per cent of network failures caused by connector end-face contamination.

Effective cable management plays an essential, supporting role in ensuring efficient connectivity and viable connector performance, especially in high-density AI and HPC environments. Modern techniques may include cable trays, straps and proper routing paths – all of which can prevent tangling, physical damage and signal loss.



When it comes to advanced testing and monitoring tools, optical time domain reflectometers (OTDRs) and optical loss test sets (OLTS) offer advanced methods to ensure fibre network integrity. These tools enable engineers to:

- Identify faults with precision up to 0.5m.
- Measure signal loss across the entire network.
- Verify network performance in real-time.

This proactive approach allows for pre-emptive maintenance and swift fault interventions. It also minimises the risk of network downtime and performance issues.

LOOKING AHEAD

Specialised connector and connectivity solutions continue to evolve alongside AI and HPC environments. The growing need

for increased AI data centre performance drives the evolution of fibre connector design. Newer, more efficient connector designs such as SN-MT and MMC connectors complement traditional LC and MPO connectors, offering higher fibre counts and lower insertion loss.

Multi-fibre very small form factor (MF VSFF) connectors advance optical fibre connectivity by maximising both port density and network performance. MF VSFF supports multiple fibres, making them ideal for high throughput AI and HPC applications.

As the connective fabric of optical fibre environments continues to evolve, MF VSFF plays an important role in providing high-performance connections between emerging fibre types and configurations. MF VSFF's high fibre count and ability to support increasing data rates ensure their continued relevance as a long-term, efficient solution.

EFFICIENCY DRIVE

Managing and maintaining effective, high-density optical fibre connectivity plays a pivotal role in the future of AI data centre efficiency. By adopting best in class structured cabling solutions, regular maintenance practices, innovative connector designs and advanced testing and monitoring tools, operators can maximise infrastructure performance and reliability. The evolution of optical fibre connector designs and the ongoing adoption of MF VSFF connectors will shape the future connectivity landscape. Data centre operators must stay informed about these advancements to meet the growing demands of AI and HPC workloads, and those who prioritise connectivity will be well-positioned to lead in the era of exascale computing. ■

MANJA THESSIN

Manja Thessin serves as enterprise market manager for AFL, leading strategic planning and market analysis initiatives. She has more than 20 years of ICT experience in the field of design and engineering, as well as project management, across data centre, education, industrial/manufacturing and healthcare applications. Thessin holds BICSI RCDD and RTPM certifications.

Going the distance

Piers Benjamin of Corning Optical Communications explains what's involved in establishing a long-reach flexible cabling infrastructure and the benefits of doing so

Imagine a modern stadium that you'd visit to watch a sports game or concert. As you enter you might pass through rigorous security procedures, sometimes with sophisticated measures in place that use enhanced facial recognition. At the extremities of the stadium, it's likely that IP cameras and security devices will be in place to monitor any potential threats. Within the stadium itself, high-density and reliable Wi-Fi networks support the heightened mobile demands of thousands of users at once. Some stadiums have even launched 'frictionless' retail stores, where guests can scan their payment device at the entrance, grab their items and simply walk out of the store to complete their purchase.

DEEP DIVE

All of these user features put additional strain on infrastructure, with more and more real-time applications that need processing at the edge of the network. However, stadium networks are just one of several use cases where the rise of real-time applications that need processing at the edge – from security and telecommunications to building automation systems – are driving a need to migrate data workloads deeper into the network.

IP cameras and security devices are now common throughout indoor and outdoor spaces but may not be close to existing telecom rooms or a power over Ethernet (PoE) based switch. The power requirements for these devices are only set to increase with the advent of artificial intelligence (AI) integrated cameras with added sensors.

Traditionally, copper infrastructure has provided a sufficient backbone for in-building network applications but, quite literally, it falls short when it comes to carrying data over distance, as it reaches its limits at 100m. Traditional structured wiring

also requires a proliferation of cabling in the horizontal pathway, creating network congestion that is hard to manage over time. With the added hindrances of aging installations and packed telecom rooms, developing a LAN that meets current and future demands – with minimal impact to facilities – must be top of mind for many network operators.

YOUR FLEXIBLE FRIEND

The core elements of a long-reach solution are a flexible cabling infrastructure, an intelligent remote power solution and connectivity at the edge. Optical fibre is the obvious solution for connecting end devices in the LAN – this can be achieved directly or via conversion equipment like media converters or optical network terminals (ONTs), and in point-to-point or point-to-multipoint passive optical networks (PONs).

In a traditional enterprise LAN IT architecture, data is transmitted either entirely by copper or through a combination of a fibre backbone plus copper to the edge, requiring equipment closets or intermediate distribution frames (IDFs) throughout the network. With fibre, the network can operate from a central equipment room or main distribution frame (MDF), eliminating the need for IDFs and reducing power and cooling expenses in the process.

ENERGY PROVIDER

Power is best supplied using composite cabling that contains both fibre and copper conductors under the same cable jacket. This leverages the bandwidth capabilities of singlemode fibre and the powering capabilities of copper to deliver both data and power to enable devices at the edge of the network. With some composite solutions that can reach distances over 600m for power, this is ideal for long-reach or remote applications such as security cameras in a parking area or outdoor campus-wide Wi-Fi.

Composite cable can also take up much less space, streamlining infrastructure on to a single cable, meaning more capacity for future upgrades and, often, reduced maintenance costs. Eliminating the need to install separate cables for data and power also saves time on the installation. Another integral part of a fibre deep design is the remote powering solution. A power supply unit is a straightforward solution that can be stacked up based

'The core elements of a long-reach solution are a flexible cabling infrastructure, an intelligent remote power solution and connectivity at the edge. Optical fibre is the obvious solution for connecting end devices in the LAN.'

on the number of devices required. The ports can also be split, depending on the requirements, the total budget and distance away from the endpoint.

READING THE SIGNALS

If an end device such as a security camera doesn't feature a fibre input/output, conversion equipment can change the signal from optical to traditional copper and connect to the device with a short copper patch cord. Media converters can provide a cost-effective solution here to extend individual ports to devices at the edge, especially when opting for a solution that is interoperable with existing copper or fibre switches.

Today's media converters offer a range of functionality including improved diagnostic capabilities and downtime prevention. They are also typically interoperable with existing copper or fibre switches. Perhaps most critically for businesses with an eye on future requirements is the ability, afforded

by some media converters, to provide 10Gb/s of data at the edge of the network with 90W of power. Building in this contingency for the higher power devices we can expect in the coming years provides some obvious efficiencies.

FUTURE-READY NETWORK

Once we have a future-ready infrastructure in place, network upgrades and expansions can become much more cost-effective and simpler. As speeds and standards evolve, we can upgrade electronics in the head-end and at the edge without having to rip and replace cabling. While there is still a place for copper in connected building infrastructure, the limitations of copper solutions in bandwidth, power handling and distance mean networks should be designed to push the fibre-to-copper transition point deeper into the network, or to the edge of it.

The quickly evolving landscape of the internet of things (IoT), sensors, AI and machine learning models is propelling a significant shift in surveillance and monitoring systems, turning data into insights far beyond traditional expectations. This transformation into smart systems equipped with sensors marks a new era, wherein IT plays a vital role in managing and maximising their potential across diverse applications at greater range.

MAKE A CHANGE

Despite the initial outlay, transitioning to a long-reach fibre infrastructure now – and prioritising fibre for any new builds – will pay dividends in avoiding time-consuming rip and replace in future to meet new technology demands and changing network needs. This means more resilience and a smaller carbon footprint too. ■

PIERS BENJAMIN

Piers Benjamin joined Corning Optical Communications in 2018 as EMEA marketing manager for in-building networks. He has over 14 years' experience in the industry, with past marketing roles including working for a leading UK distributor. At Corning, Benjamin is responsible for the marketing activities of the traditional LAN and fibre to the edge technologies.

Panduit

Panduit's European manufactured Base-8 and Base-16 optical fibre infrastructure products offer a complete solution to 400Gb/s and 800Gb/s (2x400Gb/s), for switch to server and leaf-spine connectivity. Base-8 continues to demonstrate its highly effective installation and space saving at the connection point, harnesses and cable runs, while Base-16 solutions extend these capabilities in high-speed and high-density breakout applications.

Base-16 structured cabling, with small form factor cassettes, PanMPO, MPO-16 and Base-16 cabling, simplifies network deployment in greenfield networks. Furthermore, multimode short reach variant using Base-16 interconnection with SR8 transceivers can be used over existing Base-12 structured cabling infrastructure using a conversion cassette.

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

Corning Optical Communications

Corning's Evolv portfolio can simplify and accelerate deployments, delivering significant cost savings and helping network operators meet their sustainability goals.

The Multifiber Pushlok 'stick-and-click' connector is compact and optical fibre dense, allowing network operators to deploy more fibre in tighter spaces. It is a key feature in Evolv solutions, which take complicated splicing tasks out of the field to help installers connect homes and businesses more efficiently. The technology enhances three key Corning Evolv solutions:

- Evolv Assemblies with Multifiber Pushlok Technology add flexibility to network architecture.
- Evolv Terminals with Multifiber Pushlok Technology include a new 'stubless' version that reduces packaging by up to 65 per cent per assembly.
- Evolv FlexNAP with Multifiber Pushlok Technology is pre-connectorised to fit operators' customer-specific locations with less labour costs.

To find out more **CLICK HERE.**
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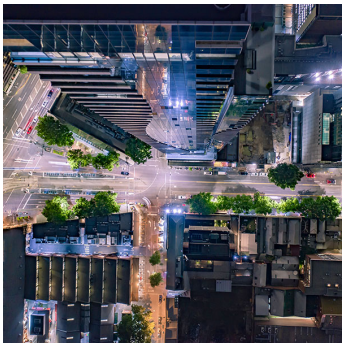
Wesco Anixter

Wesco Anixter is making its entroCIM digital solution available globally to help more organisations better monitor and control their building operations using data. entroCIM is a central intelligence manager (CIM) software solution that aggregates data from disparate building devices and systems into a single digital interface.



Using entroCIM, building owners and operators can access real-time building system data, schedule maintenance, control building operations and get predictive insights into what's happening in one or more facilities – all in one place. This can help them manage energy use, reduce maintenance costs, optimise space, improve safety and increase productivity.

Wesco Anixter can help organisations deploy and maximise the return on investment (ROI) of entroCIM in any part of the world. The digital solution also complies with global regulations like the European Union's General Data Protection Regulation (GDPR).

entroCIM is the latest addition to Wesco Anixter's innovation solutions portfolio, which can help organisations know more and do more by using the connected technologies in their facilities.

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

Allied Telesis

Allied Telesis has launched two new x240 Series switches:

- x240-10GHXm – 8-port 90W PoE++ multi-gigabit edge switch with two SFP+ ports packed in a half rack size device
- x240-26GHXm – 24-port 90W PoE++ multi-gigabit edge switch with two SFP+ ports

Engineered to meet the evolving demands of modern business operations requiring high-performing network access, the x240 Series offers unparalleled flexibility, performance and power delivery in a compact design.

These advanced Layer 3 multi-gigabit switches are equipped with 10Gb/s uplinks and offer up to 90W of power (PoE++) for connecting devices such as outdoor security cameras, access points and audiovisual devices. The two SFP+ uplinks allow a high-performance data connection to the core of the network, where longer distances are required.

Multi-gigabit ports enable seamless upgrades to Wi-Fi 6/6E and Wi-Fi 7 access points, which require a data link performance exceeding 1Gb/s, without the need to replace existing cabling, as multi-gigabit technology supports bandwidths of 2.5Gb/s and 5Gb/s on legacy cables.

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

Joining the dots

Aginode's Rachid Ait Ben Ali looks at how sustainability demands are shaping connector selection and usage

Fast-changing sustainability demands in relation to requirements for power over Ethernet (PoE), Single Pair Ethernet (SPE), Wi-Fi, data transmission and other areas are playing a crucial role in the selection and usage of connector types across various applications. That means you need to select, implement, monitor and maintain connectors wisely.

TREND SETTING

We can discern several key areas in which connectors have an impact on, and play a role in, sustainability. These are performance, materials usage and practical aspects such as production, packaging, logistics, installation and recycling. Let's look at these areas in the context of current and upcoming technology and sustainability trends and requirements.

• Internet protocol (IP) based network convergence

A converged network integrates multiple communication services on to a single IP infrastructure. Discrete systems with limited functionality and higher costs are abandoned in favour of running everything over a single IP backbone.

A good connector will reduce 'resistivity' at the termination point and can ensure proper functioning over longer distances. This avoids the use of devices such as repeaters and amplifiers, which improves overall environmental footprint. High-quality connectors minimise signal degradation, allowing data to be transmitted more effectively.

Ideally, connectors should be able to support higher data rates and high levels of power transmission (PoE++), allowing multiple services such as data, voice, video and power to run over a single cable. This reduces the number of cables required to support different services.

• PoE++

PoE applications require connectors that can accommodate larger wires and withstand long-term electrical wear, such as spark damage. Ensuring connector performance is PoE++ compliant ensures better electrical transmission, contributing to improved carbon footprint. Devices can also be powered more reliably over longer distances without requiring additional power sources or cabling.

PoE++ connectors are backward compatible with earlier PoE standards, enabling the use of existing Ethernet cabling while still supporting higher power requirements. This reduces the need for re-cabling or additional infrastructure, further minimising the amount of cabling needed, providing the existing cable is adequately dimensioned for remote power applications. I would recommend the use of AWG22 and shielded cable for PoE++.

• Smart building systems

Smart buildings use integrated systems to optimise energy usage. Smart lighting, heating, ventilation and air conditioning

(HVAC), as well as other building management systems, can automatically adjust based on real-time and stored data on occupancy, daylight and temperature. This reduces energy waste, leading to lower consumption and a smaller carbon footprint.

Long-distance connectivity requires connectors that reduce signal degradation and minimise signal loss and bit error rates. Poor quality or mismatched connectors can introduce noise, crosstalk or electromagnetic interference (EMI) into the system, which increases the likelihood

This does require large numbers of sensors and actuators. Therefore, connectors that offer higher bandwidth, PoE++ and are ready for SPE cabling go above and beyond requirements laid out in current standards. This means extended distances can be realised without repeaters or amplifiers, which require power. Data can be faultlessly transmitted up to 110m-120m, depending on the chosen solution.

• SPE

SPE introduces new connectivity considerations, such as the need for more compact and efficient connectors.

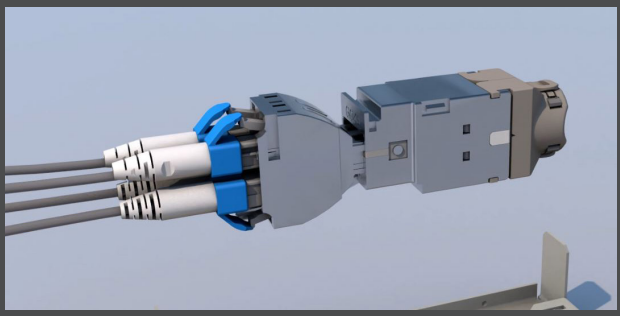
of corrupted data packets.

Correctly specified connectors are vital to cable performance and minimising losses in a network, while ensuring optimal electrical and signal transmission. Preserving signal integrity helps minimise errors in data transmission and bit error rate (BER), while extending transmission distance. Connectors designed with electromagnetic compatibility (EMC) shielding protect against signal disruptions. Supporting standard Ethernet devices using RJ-45 connectors and port splitters that can connect multiple SPE devices ensures seamless integration of SPE with existing IP infrastructure, making it adaptable for

‘By choosing high-quality connectors that support IP-based networks, PoE++ and SPE, businesses can reduce cable usage, optimise energy efficiency and extend product lifecycles.’

smart buildings and large networks.

Cu LC connectors offer several benefits when used to connect SPE to RJ-45 interfaces. They can be easily adapted to RJ-45 ports using converters, making them compatible with existing Ethernet infrastructure. That means organisations can upgrade to SPE while maintaining compatibility with legacy systems, saving costs and extending the lifetime of devices. Their compact size makes them ideal for applications with space constraints, in which they support a greater number of ports. Cu LC connectors maintain signal integrity over longer distances, ensuring reliable data transmission. This is crucial when connecting SPE devices, which are often distributed over large areas.



• Production, packaging, supply chains and recycling

Environmental and sustainability considerations such as reducing packaging waste and optimising supply chains are increasingly affecting connector design and selection. Every system component is scrutinised in line with corporate social responsibility (CSR) requirements. Using connectors that can be re-terminated in the event of wrong termination minimises material waste. By incorporating energy efficient, low emission production methods and reducing the use of harmful chemicals during manufacturing, the environmental impact of connector production can be reduced.

Designing connectors with recyclable materials makes it easier to recover valuable resources at the end of the product's life. Encouraging take-back schemes, where manufacturers retrieve used connectors for recycling, ensures that fewer materials end up in landfill.

Manufacturers can also explore ways to upcycle discarded components, either for new connector production or for other products, reducing the need for virgin materials. Of course, making sure that connectors meet international environmental standards such as RoHS or REACH further improves the sustainability profile. We’re also seeing a clear trend towards zero plastic packaging in the industry, necessitating a switch to recyclable or biodegradable packaging for transporting connectors.

• Installation

Ease of installation is also becoming more important, particularly as industries

converge and more non-specialist installers (who are often more familiar with CCTV or alarm systems) are contracted. If connectors can be installed and terminated rapidly and without errors, the time and labour required for network set-up are significantly reduced, and rework is avoided. This leads to lower energy consumption, as installation crews spend less time on-site, reducing the use of tools, transportation and other resources required to support extended installation periods. Reducing the chances of errors, such as misalignments or faulty terminations, means fewer connectors are discarded.

• Beyond RJ-45

The RJ-45 connector is the cost-effective, widely compatible industry standard for Ethernet connections, widely used across various network types. However, there are several other topology solutions that offer significant sustainability benefits without RJ-45 connectors. Fibre to the office (FTTO) and passive optical LAN (POL) networks primarily use fibre optic cables rather than traditional copper cabling, so do not typically use RJ-45 connectors, which are designed for copper-based Ethernet connections.

FTTO uses fibre cable to manage micro switches. The micro switches can be used in a sustainable way by shutting down unused RJ-45 ports, which reduces consumption.

Supply and demand

Sustainability demands are increasingly shaping the selection and use of connectors in various applications. Factors such as performance, materials usage and practical aspects like packaging, production and recycling play crucial roles in minimising environmental impact.

By choosing high-quality connectors that support IP-based networks, PoE++ and SPE, businesses can reduce cable usage, optimise energy efficiency and extend product lifecycles. High quality, reliable pre-terminated links mean no rework is needed and materials wastage is theoretically zero. Additionally, eco-friendly packaging, efficient installation and modular designs can also enhance sustainability in connector usage. Of course, each application introduces unique connector requirements – so when in doubt, speak to an expert! ■

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.

TechAccess and Siemon partner to deliver advanced IT infrastructure solutions to the South African market

TechAccess will serve as Siemon's value-added reseller for the South African market, offering Siemon's passive IT network infrastructure solutions to businesses across the region. TechAccess has built a reputation for delivering turnkey solutions by leveraging the latest innovations in technology. The partnership with Siemon aligns perfectly with TechAccess' goal of helping clients navigate the complex world of data centres and enterprise IT infrastructure, providing solutions that meet current and future needs.

L-R Sivakumar Iyer of Siemon, Prem Rodrigues of Siemon and Jaxon Martin of TechAccess

'This partnership marks a significant step in expanding our offerings to the South African market,' said Jaxon Martin, managing director at TechAccess. 'By collaborating with Siemon, we can deliver a broader range of high-performance solutions tailored to the unique needs of our clients, particularly in the areas of data centre fit-out infrastructure, advanced structured cabling, smart building IT infrastructure, and data centre infrastructure design and management.'

Nokia creates regional Innovation Center in Morocco to serve EMEA customers

Nokia has opened a Nokia Innovation Center (NIC) in Salé, Morocco. Designed as a regional hub to serve EMEA, the NIC is equipped with advanced technologies from Nokia's entire network infrastructure portfolio. The NIC will also contribute to Digital Morocco 2030 by playing a pivotal role in advancing digital skills, supporting 5G readiness and fostering innovation.


Pierre Chaume

The NIC features a comprehensive range of technologies including IP, optical transport and fibre solutions, housed within a state-of-the-art data centre. This facility supports diverse use cases from 5G mobile backhaul to data centre fabric and security, and will be a focal point for innovation in critical network technologies, enabling testing, verification, deployment and training of advanced solutions.

Pierre Chaume, vice president of north, west and central Africa for network infrastructure at Nokia, said, 'We are proud to establish this Innovation Center in Morocco, which will serve our customers and partners in the EMEA region and contribute to the development of local talent and the broader digital ecosystem in line with Digital Morocco 2030. This underscores our commitment to innovation, sustainability and the growth of critical networks that drive digital transformation across industries.'

Schneider Electric opens Critical Power and Cooling Hub to address data centre skills shortage

Schneider Electric has opened the doors to its Critical Power and Cooling Hub in Leeds – a brand-new facility to help customers, channel partners and engineers gain dedicated training for its data centre, power and cooling solutions. Launched as part of its Leeds Innovation Hub, the opening represents the next step in the rapid expansion of Schneider Electric's recently launched Schneider Electric training programme for the UK and Ireland (UK&I) and follows the announcement of its new £42m manufacturing facility in Scarborough.

The new Critical Power and Cooling Hub will provide customers and partners with a direct access point into the vast array of training options and demonstration resources. It includes an extensive training program that covers innovations in uninterruptible power supplies (UPS), data centre physical infrastructure, cooling and energy management solutions, as well as a comprehensive view of the latest safety standards and energy efficiency regulations impacting the industry.

'We recognise the urgent action needed to address the skills gap across the data centre, power and engineering sectors,' said Mark Yeeles, vice president of the Secure Power Division at Schneider Electric UK and Ireland. 'Through our new Critical Power and Cooling Hub, we're helping to decentralise the skill sets needed to build the grids and AI data centres of the future.'

CHANNEL UPDATE IN BRIEF

Netskope has appointed Colette Kitterhing as vice president UK&I. Kitterhing has significant experience in networking and cybersecurity, as well as partnership management and operations, most recently in regional sales director roles for Palo Alto Networks and Riverbed.

Node4 has been selected for the Business Applications 2024-2025 Microsoft Inner Circle for the fifth consecutive year. Membership of this elite group is based on sales achievements that rank Node4 in the top echelon of Microsoft's global network of partners.

With the growing demands for 5G connectivity, Huber+Suhner and CL Electrical Controls have launched a new production line in Bristol.

Scott Armul will be promoted to executive vice president, global portfolio and business units at Vertiv. Armul will focus on driving a growth-oriented global portfolio strategy, as Vertiv continues to expand its offerings to meet evolving industry and customer needs.

Quick clicks

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

AI Reference Designs To Enable Adoption: A Collaboration Between **Schneider Electric** And **Nvidia** is a white paper that examines the deployment of high-density AI clusters. **CLICK HERE** to download a copy.

Ayming's International Innovation Barometer 2025 has found that 84 per cent of businesses globally are benefiting from AI. **CLICK HERE** to read it.

Improving Sustainability In Data Centers is report from **Nutanix** that claims energy efficient data centres could save up to €25bn by 2030. **CLICK HERE** to download a copy.

Bugcrowd's 2024 Inside The Mind Of A Hacker Report is available to download by **CLICKING HERE.**

A report from **Snowflake** and **MIT Technology** has discovered that while business leaders understand the benefits AI can bring to their organisation in terms of improving efficiencies, productivity and customer engagement, 78 per cent are held back by poor data foundations.
CLICK HERE to download Data Strategies For AI Leaders.

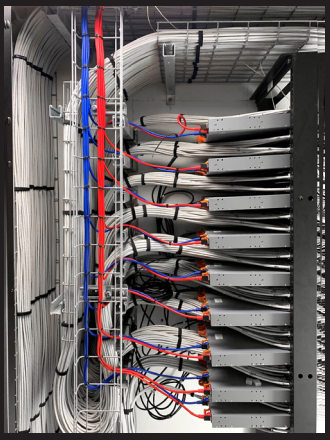
Advanced Networks For Artificial Intelligence And Machine Learning Computing is a white paper from **AFL**.
CLICK HERE to download a copy.

The annual Data Centre Cost Index from **Turner & Townsend** analyses the current average cost per watt to build data centres in 50 global markets and uses survey responses from 250 sector leaders to pinpoint trends across the industry.
CLICK HERE to download a copy.

Living on the ceiling

It is becoming increasingly important to modernise office spaces and digital services, improve efficiency and support sustainability goals through smart building technologies. R&M's Matthias Gerber shares some insights into best practices and what to look out for with cable management

The term 'digital ceiling' refers to the integration of network connected technologies into the physical ceiling of office spaces. Systems are installed in the ceiling, creating a smart and responsive environment that can monitor and adjust lighting, temperature, air quality, security and other elements to optimise efficiency and the user experience. The internet of things (IoT), smart sensors, lighting, environmental controls and other connected devices are converged and collectively managed over a unified IP network.



BREAKING BARRIERS

This all over IP approach can extend data networks through an entire building's ceiling in a 'honeycomb' fashion, making it possible to connect devices to building automation via zones with pre-installed overhead connecting points (service outlets). Real estate managers or tenants can benefit from plug and play digitisation without barriers – fast and at low cost. All they need to do is plug in network switches, sensors, controls, wireless LAN access points and other distributed building services.

As with every type of structured cabling, good cable management and labelling is essential for the digital ceiling. This prevents network downtime, facilitates easier maintenance, system upgrades and seamless expansion, significantly reduces costly troubleshooting and ensures regulatory compliance. Potential hazards of neglecting proper cable management include issues with resistance unbalance, signal interference, overheating and data transmission.

CABLE SELECTION

Singlemode optical fibre is advisable for long distances or backbone connections, as it offers higher bandwidth and future proofing. Multimode fibre (OM3/OM4) is often used for shorter distances. The cabling should adequately support high-speed connections but also ensure a reliable power supply for the device.

Make sure to use high-quality cables that meet or exceed recommended standards. When choosing twisted pair cables to support power over Ethernet (PoE), several factors need to be considered, especially

given that different PoE ratings – like PoE, PoEP (Plus), and 4PPoE – exist. Ensure cabling matches the power needs of your PoE devices and the capabilities of your PoE switch or injector.

PLAN OF ACTION

Higher power requirements necessitate higher planning requirements for installations. Cables running PoE can generate heat, especially in densely packed cable bundles. Use cables with good thermal performance and avoid over-bundling to allow heat dissipation. Ensure ventilation in cable trays and paths to prevent overheating, especially for high-wattage PoE (4PPoE, up to 100W). Lower diameter cables heat up more easily than higher diameter ones and, in general, require more attention during planning.

Inferior options such as copper clad aluminium (CCA) or damaged cables can lead to resistance, causing voltage drops and potential fire hazards. Avoid coiling or bundling cables tightly together, as this can cause heat build-up. Maintain some space between cables, allowing air to circulate.

Category 5e is the minimum requirement for PoE. It supports Gigabit Ethernet and can handle currents produced by standard PoE and PoEP. Category 6A is recommended to future proof the cabling, as it offers better attenuation and reduced crosstalk, making it easier to implement for higher power applications (4PPoE, Type 3 or 4).

TOP TIPS

Keep cable lengths short to minimise power loss, especially for high-power devices such as cameras and LED lighting. Avoid stretching, bending or crushing cables, as this could damage the wires inside and lead to short-circuits. Keep cable lengths below the maximum specified distance to ensure power and data integrity.

Make calculations and run tests to make sure the power capacity of the cabling is never exceeded. All cabling must conform to a Remote Power (RP) category (RP1-RP3) that defines a maximum power budget and ensures the sum of the power requirements of all (potentially) connected devices does not surpass this. Many PoE switches are now equipped with management features that allow you to monitor the power consumption of each port and this can help identify excessive power draw.

'As with every type of structured cabling, good cable management and labelling is essential for the digital ceiling. This prevents network downtime, facilitates easier maintenance, system upgrades and seamless expansion, significantly reduces costly troubleshooting and ensures regulatory compliance.'

SEPARATION AND TERMINATION

Make sure to maintain adequate separation between data and power cables to avoid electromagnetic interference (EMI). The cable segregation class gives guidance on the recommended distance and use shielded cables (STP or ScTP) in high-EMI environments if needed. Where possible, install separate pathways for data, power and control cables, which will minimise the chance of interference and make maintenance easier. Also, make sure cable trays, baskets or conduits do not pinch, compress or push cables together and that they are appropriately rated to support the weight of cables.

For copper, terminate using certified jacks and patch panels and follow the IEC 60603-7-x standard to ensure proper pinout and reliable performance. Use shielded copper cables (STP or FTP) in areas where there might be high EMI, or if you're running close to power lines or machinery. For fibre, use fusion splicing or quality field termination connectors to minimise loss and make sure connectors are always clean to avoid signal degradation.

TESTING TIMES

Perform comprehensive testing to verify connectivity, performance and compliance with required standards, and test fibres for loss using an optical time domain reflectometer (OTDR). For copper, use a cable certifier to ensure signal integrity.

It's important to point out that compliance requires RP category labelling at the floor distributor, so planners and installers must declare the achieved RP category level of the installation. EN 50174 states that RP3 is preferred for all

EN 50173-x installations, whereas ISO/EC 14763-2 mandates RP3 for ISO/EC 11801-2/-3/-4/-6. This is very often ignored!

RP categories are part of the standards for structured cabling. This defines the transmission performance and power capabilities for copper cabling systems when used for remote power delivery, such as PoE. These categories are used to classify cabling infrastructure based on its ability to safely support different levels of power delivered over the network cables. The RP category must be displayed wherever remote power sources might be connected during operations, for example, in the floor distributor. A consistent

RP category should be applied to all distributors within an installation.

DOCUMENTARY EVIDENCE

Automated infrastructure management (AIM) systems provide real-time monitoring and mapping of the entire cabling infrastructure, including copper and fibre connections. This real-time visibility ensures accurate documentation of every connected device and cable pathway. A digital ceiling integrates various smart technologies connected through structured cabling and AIM systems help by providing visibility, control and automation to optimise performance and management of these complex networks.

In a digital ceiling environment, moves adds, and changes (MACs) are frequent and if a building or section thereof is assigned a new function, these can be extensive. AIM ensures any MACs are automatically updated in the system and this prevents outdated or incorrect records, reducing downtime and troubleshooting time. AIM also allows for automatic fault detection and pinpointing, quickly identifying the exact location of any connectivity issues, including real-time alerts.

By tracking the usage of individual cables, ports and connected devices, AIM also helps ensure infrastructure is used efficiently. Underutilised or redundant connections can be tracked and the use of data and power connections optimised, ensuring a balance between capacity and demand. AIM systems also help maintain physical security by detecting unauthorised connections or disconnections in real-time. Comprehensive reporting tools help organisations comply with regulatory requirements related to network management, security and safety.

THINK AHEAD

Always design digital ceiling infrastructure with future expansion in mind. Leave room for additional conduits, fibre strands and cable trays to accommodate future devices, as digital ceilings are often subject to change and may need to follow changing building layouts. Of course, the basics of cable management always need to be observed – even with the most advanced technologies, poor basic cable management can introduce signal interference, damage and failure, resulting in data transmission errors, performance issues and downtime. Always double-check measurements, make sure terminations are of the right quality, test where necessary, and always label and colour-code cables. Watch out for cramped conduits and make sure no cables or bundles rest upon others!

MATTHIAS GERBER

Matthias Gerber, market manager LAN cabling with R&M, has worked in the cabling business in various positions within R&M for over 20 years. He has ample experience in the development and marketing of cabling systems and RJ-45 connectors. In addition, Gerber is a participating or past member of various standardisation bodies (IEC, ISO/IEC and TIA), as well as being chairman of the Swiss National MirrorCommittee for TC48.

Excel Networking Solutions

Excel Networking Solutions provides a tailored laser-engraved labelling service designed for patch panels, racks, GOPs, outlets and more. Labels can be supplied as pre-printed sheets or pre-affixed to products before delivery, streamlining the installation process. This service eliminates the need for on-site labelling, saving significant time during installation and helping reduce project costs.

Excel's labelling solution stands out for its exceptional quality and durability. Using fade-resistant acrylic sheets and precise laser engraving, it ensures labels remain legible over time, contributing to long-term cable management efficiency and professional presentation.

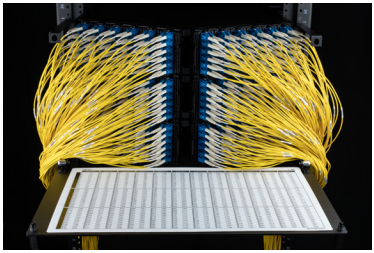
With a made-to-measure approach, Excel offers a wide array of customisation options. From destination locations and equipment identifiers to company logos and QR codes, labels can be crafted to suit specific project needs.

CLICK HERE to discover how Excel's bespoke labelling service can enhance your next project. Alternatively, contact us today on 0121 326 7557 or **CLICK HERE** to send an email for more information.
www.excel-networking.com

AFL

Whether you seek uninterrupted network performance at scale across multiple dispersed locations, or you wish to transform your artificial intelligence (AI) optimised data centre's underutilised white space into a strategic, efficiency enhancing asset, AFL can help.

Our award-winning Data Centre Interconnect solution provides centralised workload balancing for high-speed, seamless global collaboration. Choose between our state-of-the-art connectorised and spliced solutions – both are crafted using our innovative Wrapping Tube Cable with Spider Web Ribbon technology, enabling small-diameter, high-fibre count cables to increase duct capacity while accelerating installation and preventing costly civil works.



Increased computational demands translates into more servers, more racks – and a potential cabling conundrum. Our sophisticated White Space solutions can help you retrofit legacy architectures with high-capacity housings, easy-to-install cassettes and tailored assemblies, helping you grow your high-performance network.

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

Cable Management Warehouse (CMW)

Cable management solutions are essential for maintaining an organised, efficient and safe work environment. There are many types of cable management products available, providing engineers with an abundance of options to choose from. A small selection of those available are:

- Trunking. An essential solution to protect cables and keep them neatly hidden, ideal for organising both data and electrical cabling.
- Cable tray. A versatile support system that safely guides and organises cables throughout a building. Especially useful for managing bundles of data cables.
- Basket tray. Designed for strength and airflow, this tray supports electrical cables used in power distribution, control systems and communication networks.
- Conduit. Available in flexible and rigid forms, made from plastic or metal, conduit is ideal for housing both electrical and data cables.
- Cable matting. Protects cables from damage due to low level water exposure, chemical attacks from floor screed and sharp edges in flooring, ensuring long-lasting and safe cable installations.

Cable management is CMW's speciality and what we are best known for. **CLICK HERE** to see the full range of cable management solutions available from CMW or get in touch by calling 01234 848030.

www.cmwltd.co.uk

Tag team

Richard Cann of Mayflex explains why getting the labelling of cabling right is increasingly vital and provides some tips on how to achieve it

It's a common story – it's nearing the end of a busy project and suddenly there's a rush to label the cables ahead of testing. But it doesn't need to be like this! Proactive cable labelling that is considered at the beginning of a project can offer significant time-savings and reduce costs, as well as providing a neat and tidy finish.

SIZE DOESN'T MATTER

Whether you're installing a small network or working on a massive data centre with thousands of cables travelling around the building over multiple floors, accurate labelling ensures easy identification, testing and troubleshooting. By knowing the source and destination of each cable, you can quickly resolve issues or faults, saving time and money.

Planning the labelling at a project's outset and partnering with a specialist company can prevent delays and ensure smooth testing and future maintenance. Leaving it to the last minute means waiting for labels to arrive, rushed work and less consistent label practices.

Working with an external company can help you choose the right labels for your needs. It's critical to label cables correctly, as you need to know what's going where. All cables need to be tested, and the test results are linked to the cable's unique identifier. If the cables are correctly labelled you can reference a specific test result and identify the corresponding cable.

HORSES FOR COURSES

It's important to use the right labels for the right cables. Adhering to labelling conventions will ensure standards compliance, and assist with traceability and asset management. Four primary cabling standards address labelling requirements – ISO/IEC 11801, EN 50173, EN 50174 and ANSI/TIA-606-C. These standards, international and regional, outline guidelines for proper labelling practices within generic cabling systems, telecommunications cabling installations and infrastructure administration. Cables must be labelled in a meaningful way that ensures they can be easily identified.

Different installations require specific cable types. Partnering with a specialist labelling company early in a project ensures you use the most suitable labels. An external company can provide bespoke solutions tailored to your exact needs, including specific sizes and colours, and work to your own labelling scheme.

WAYS AND MEANS

Self-laminating labels are one of the best ways to label a cable. Designed to wrap around cables, they protect the

print from environmental factors including temperatures between -20°C and 80°C, ultraviolet (UV) rays and moisture. To help you distinguish between various cable runs within a network infrastructure, use loom labels to identify and organise bundles of cables. Loom labels are typically made of plastic and attach to the cables with cable ties.

If you need to identify and organise components such as patch panels, racks and enclosures, panel labels are essential. These can be cut and printed to fit the dimensions of various panels sizes including 19-inch, full and half panels.

Outlet labels make it easier to locate and connect devices to the appropriate network ports. Usually small and rectangular, they contain a number or a code that corresponds to a specific network port or location.

ROOM FOR MANOEUVRE

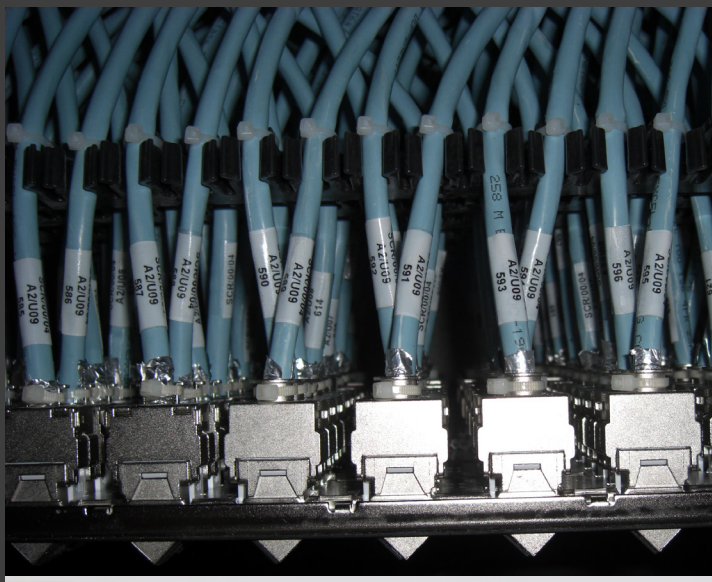
For installations in data centres or server rooms, rack labels will make it much easier to find and organise individual racks or components. These tend to be larger than panel or output labels and are designed to be attached to the front or side of a rack. They help quickly locate specific racks or equipment for future maintenance, troubleshooting or asset management requirements.

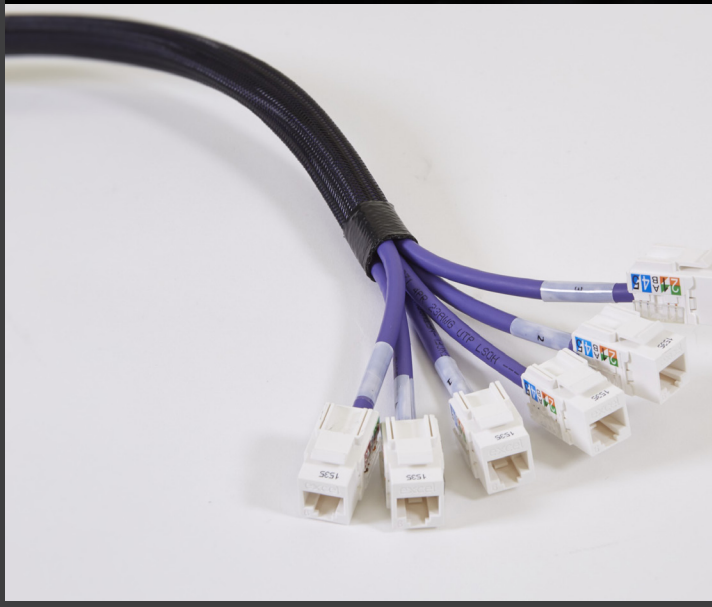
Some cables will run outside, and using a Traffolyte type or acrylic label protects the information printed from rain and other adverse weather conditions. Traffolyte and acrylic is extremely durable and can withstand harsh environments, while its VHB adhesive backing provides a very strong bond.

Many network installations will have cameras, wireless access points and other awkwardly shaped objects that all need a label. If you decide to outsource label creation, most specialist companies offer laser engraving services and labels that can be made in any shape or

'Whether you're installing a small network or working on a massive data centre with thousands of cables travelling around the building over multiple floors, accurate labelling ensures easy identification, testing and troubleshooting.'

size. Bespoke laser engraved labels provide a quality, time-saving solution that reduces on-site resource time. You will be able to ensure that every application is professionally labelled from the moment it's installed and engraving labels on to fade-proof acrylic leads to long-term quality and reliability. It's a bespoke, made to measure solution that will meet individual project requirements and, when time is tight, some companies will provide next day delivery.





THINKING AHEAD

As well as labelling services, consider using a specialist company that also offers pre-termination. This can significantly reduce installation time and costs by pre-assembling cables off-site. Pre-termination reduces installation, equipment and specialist labour costs, and it can reduce installation times by as much as 75 per cent. Specialist companies can deliver fast turnaround times and you will receive a finished product which is

100 per cent inspected, factory tested and fully traceable.

Some companies also offer 25-year warranties for peace of mind, just in case something doesn't go to plan. Pre-termination is a sustainable choice as it minimises waste on-site and maximises cable usage. The added bonus is that you can expect pre-terminated cables to arrive pre-labelled, so there's no need to waste time on-site applying labels, which for some jobs could include thousands of cables.

All you need to do is provide any labelling conventions in a spreadsheet and the labels will be customised to your specifications. Alternatively, the labels will arrive using a standardised sequence, for example 01, 02, 03, 04 and 05, which is more than sufficient to help you label cables. Sometimes, cable labelling will be included in the cost of pre-termination, which will save you more time and money.

STRATEGIC DIRECTION

Designing and planning cable labelling from the beginning of a project will significantly enhance the efficiency of installation and future maintenance of your network infrastructure. Cable labelling is a critical part of the job and partnering with a specialist company that also offers pre-termination will provide access to expert guidance, a wide range of labelling solutions and the ability to customise labels to your exact needs. It will reduce installation time and costs, aid troubleshooting and ensure compliance with regulations. You'll also guarantee that your project is completed with cable labels that provide a permanent, professional finish. You'd be lost without a label! ■

RICHARD CANN

Richard Cann is technical services manager at Mayflex. He joined Mayflex in February 2015 to help strengthen the various technical support, manufacturing, assembly and value-added elements of the business. Cann has worked for several manufacturers and installers in related industries, gaining experience in production and product engineering, design, manufacturing, engineering and operations management.

Vantage Data Centers breaks ground on 192MW Ohio data centre campus

Vantage Data Centers has announced its entrance into the central Ohio data centre market in response to increased demand for scalable and sustainable digital infrastructure in the region. Over $2bn will be invested in the project, with more than 1,500 individuals employed across the construction and long-term operation of the campus.

Located just outside Columbus in New Albany, Ohio, the OH1 campus will provide secure and reliable infrastructure for cloud technologies and artificial intelligence. Situated on 70 acres, OH1 will provide a total of 192MW of IT capacity across more than 1.5 million square feet. The first building is slated to open in late 2025.

OH1 will be built in alignment with Vantage's 'sustainable by design' blueprint and will achieve LEED Silver accreditation. The campus will be included in Vantage's commitment to achieving net-zero operational carbon emissions by 2030 across its global portfolio.

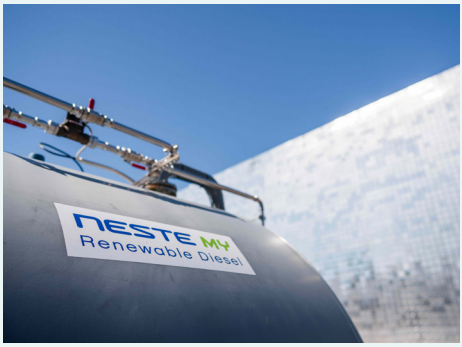
Schneider Electric increases production capacity at its largest European data centre factory

Schneider Electric has significantly scaled the manufacturing and production capacity of its Barcelona prefabricated data centre factory – increasing it from 7000m² to 12,000m² in response to accelerated customer demand for prefabricated, high-compute workload data centre solutions. Headquartered in Sant Boi de Llobregat, Barcelona, the factory and large-scale logistics centre is now the largest manufacturing site for Schneider Electric's prefabricated modular data centres in Europe.

Prefabricated modular data centres are one of the most efficient and sustainable ways to design and deploy high performance data centre capacity at speed and scale, while ensuring less wastage, optimised production and a reduction in the embedded carbon within the space. By scaling-up its end-to-end production capacity in Barcelona, Schneider Electric is reinforcing its supply chain capabilities at a time of unprecedented growth, and ensuring customers in Europe have access to fast, predictable and high-quality data centre solutions, which can be designed and operational in as little as 24 weeks.

Verne switches to Neste's renewable diesel to fuel back-up power generators at its Finnish data centres

Verne is partnering with Neste to power back-up generators at its Finnish data centres in Helsinki, Pori and Tampere. By switching to Neste MY Renewable Diesel, Verne expects to reduce back-up generator greenhouse gas emissions by an average of 90 per cent over the lifecycle of the fuel when compared to fossil diesel. This initiative is part of the company's commitment to minimise the environmental impact of its own data centre operations and to make it easier for customers to meet their sustainability goals.



Neste's renewable diesel is a hydrotreated vegetable oil (HVO) made from 100 per cent renewable raw materials such as animal fat from food industry waste, used cooking oil, and various waste and residues from vegetable oil production. With a similar chemical composition to fossil diesel, Verne can make the switch to renewable diesel without any modifications to its infrastructure.

Crucial for Verne's Finnish operations, renewable diesel is also better suited to very cold weather conditions than fossil diesel. It can be stored in temperatures as low as -32°C with better start-up and throttle response. Importantly for back-up power, it can also be stored over long periods of time without deterioration in quality or water accumulation.

PROJECTS & CONTRACTS IN BRIEF

Maincubes has acquired a 14-hectare plot of land in Nauen (Havelland) on the outskirts of Berlin. Designed for cloud services, high-performance computing and artificial intelligence (AI), the first phase of the development is set to begin in 2025.

Thai Airways has modernised the network infrastructure of its headquarters in Thailand by deploying Juniper Network's AI-Native Networking Platform to deliver a reliable, measurable and secure wired and wireless service.

A low carbon future for the West Yorkshire borough of Calderdale has been set out in an ambitious new plan that identifies the key priorities needed for the borough to reach its net-zero by 2038 target. Compiled by IES using its digital twin technology, the Local Area Energy Plan (LAEP) identified changes to the borough's buildings and energy generation needed to hit the net-zero target.

NVIDIA has agreed to provide Algorithmiq with its graphics processing units (GPUs). Thanks to Algorithmiq's suite of quantum computing software, it opens the door for NVIDIA to power the future of quantum computing.

MISSED AN ISSUE?

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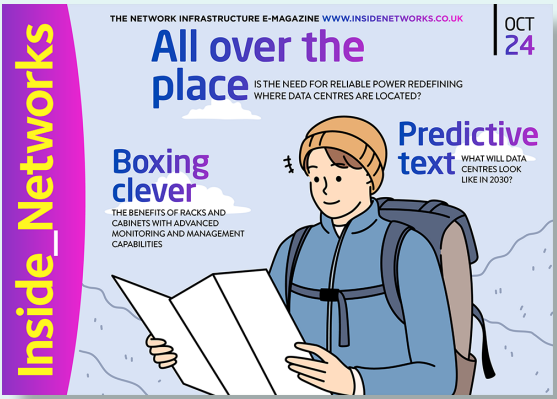

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The best of both worlds

Neil Potter and Grant Bilbow of Eaton discuss how data centre operators can meet growing demand, while delivering sustainable progress

The rate of businesses adopting cutting-edge technologies such as artificial intelligence (AI), internet of things (IoT) and cloud services has increased massively, as they look to drive efficiency and growth in the challenging economic climate. This has resulted in a rising demand for resilient, reliable and efficient data centre infrastructure to manage the energy demands of such technology. In fact, Morgan Stanley predicts generative AI alone to drive more than three-quarters of global data centre power demands in 2027.

REPORT BACK

The challenges facing data centre operators do not stop at meeting burgeoning energy demands. Sustainability is also a critical concern, as seen through new environmental reporting mandates. The revised European Union Energy Efficiency Directive, for instance, introduced an obligation for member states to monitor the performance of data centres. Furthermore, the European Commission is due to implement a scheme to rate energy performance and sustainability.

It's clear that the industry is juggling several urgent priorities. On one hand, the demand for robust performance and reliability in an era of rising demand, while, on the other hand, increased scrutiny to minimise environmental impact. The solution is a systems-engineered approach.

TICKING ALL THE BOXES

A systems-engineered approach to data centre design presents a clear way forward to unlocking truly sustainable progress, while meeting growing demand. Methodical and multidisciplinary, it considers the data centre as a complex system composed of interrelated and interdependent elements. It moves away from the conventional practices of mixing and matching and instead ensures

all parts of the data centre such as power, cooling and IT infrastructure work together efficiently throughout its lifecycle – from design and implementation to operation and retirement.

Adopting a systems-engineered approach facilitates the sustainable development and operation of data centres. It provides operators with four key capabilities – adaptable and dynamic design, a focus on energy efficiency, the introduction of renewable energy sources, and holistic assessment metrics.

'The challenges facing data centre operators do not stop at meeting burgeoning energy demands. Sustainability is also a critical concern, as seen through new environmental reporting mandates.'

DYNAMIC DESIGN

Improving the environmental performance of a data centre – whether it be carbon footprint, water consumption or waste management – is a challenge when you cannot comprehensively review the full picture. If you don't know how components interact with each other, let alone the external environment, any changes you make to the system could deliver unintended externalities, undermine synergies and generate trade-offs.

At the same time, the need for agility is apparent, with emerging technologies generating variable demand patterns. To effectively address the challenges associated with variable loads, operators must have access to a full system view. By looking at data centres as a unified whole, you can identify the changes required in design and the best way of making them, all while understanding their impact and optimising flexibility. You can then ensure a design remains effective in fast-evolving environments.

CENTRE OF ATTENTION

Being able to review data centres in their entirety is particularly useful when looking at energy efficiency, as it enables the review of the power train and its associated interdependencies across the full lifecycle. Efficient use of energy is only going to become more important, particularly as the proliferation of emerging technologies puts even greater strain on the power supply to data centres.

In the UK, for instance, the national grid expects data centre power usage to increase sixfold in the next 10 years. Therefore, it is essential operators renew their focus on efficiency, to ensure they can handle increased demands whilst responding to increased environmental scrutiny. With greater visibility of both the distribution of power and the conservation of power consumption downstream, data centre operators can understand each components' characteristics and impact on electrical properties, voltage, current capacity and impedance.

At the design stage, selecting and considering the right equipment with the entire power chain in mind enables improved energy efficiency. In low voltage systems, for example, using copper busbars will reduce power loss by around 25 per cent compared to aluminium ones. Along with this, a digital software

platform can monitor and manage energy efficiency through machine learning and AI to better understand at which point power distribution losses may occur and how they can be prevented. Coupled with other measures such as optimising cable lengths and using transformers with low power losses, this enables enhanced energy saving.

MEETING DEMAND

Improving energy efficiency alone will not meet demand, nor progress sustainability ambitions. Instead, attention must also turn to renewable energy sources, which are ever more important in the power ecosystem. It is essential to understand the impact of integrating renewables and alternate power sources on whole system performance and power quality. Done properly, this helps to provide resilient and reliable power and reduce the likelihood of outages.

We need to understand the impact of less rotating mass and less inertia within renewables, which, in turn, affects the quality of power flow along the power train due to less frequency control and more volatility. A systems-engineered approach means you can observe the mix of renewable on-site and off-site generation, monitoring the power being consumed and its source.

HOLISTIC ASSESSMENT

Whether integrating renewables or improving existing power trains, data centre operators will no doubt question how they can demonstrate the holistic impact of such changes. Traditionally, efficiency has been determined using metrics such as Power Usage Effectiveness (PUE) and Data Center Infrastructure Efficiency (DCiE), but such measures are only concerned with one aspect of a data centre's operation, to the exclusion of all others.

In the face of greater environmental scrutiny, we must look beyond these standard measures. From measuring operational technology (OT) and information technology (IT) efficiencies to equipment lifecycle and water usage, there are several other metrics that must

be included to calculate a holistic metric of sustainability.

With a systems-engineered approach, each individual aspect within a data centre is already measured and consolidated by a digital layer that considers the interdependencies of each aspect to determine the most efficient and sustainable data centre. From this, it's possible to devise a new maturity metric tool that, by combining all these metrics, can report on an entire system's environmental integrity.

LOOKING FORWARD

Data centres should be designed with sustainability in mind, not only to reduce their environmental impact, but also to optimise their performance and reliability in an era of increased demand. A systems-engineered approach provides a clear lens that can help unlock sustainable progress. Equipped with a holistic view of the data centre system, operators can address multiple priorities simultaneously, delivering greater efficiency, resilience and adaptability, while also minimising carbon footprint, energy consumption and waste generation. Ultimately, a systems-engineered approach rewires data centres to become both more sustainable and competitive. ■

GRANT BILBOW

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