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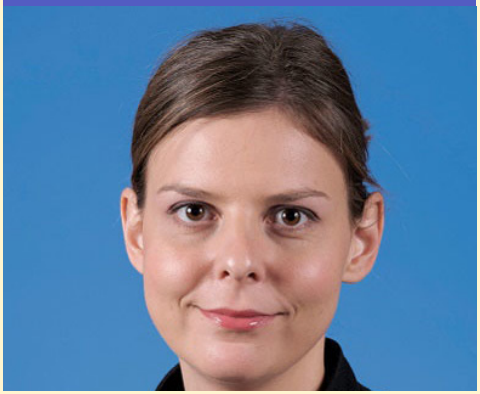

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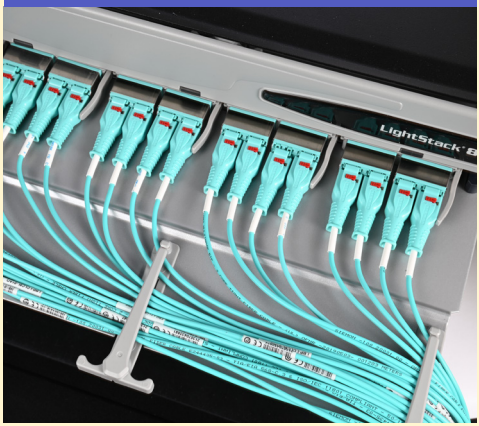

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EDITOR
Rob Shepherd
07708 972170

SUB-EDITOR
Chris Marsland

ADVERTISING MANAGER
Kate Paxton
01603 610265

CREATIVE DIRECTOR
Vishnu Joory

TECHNOLOGY CONSULTANT
James Abrahams

CIRCULATION MANAGER
Debbie King

ACCOUNTS
Billy Gallop

As someone whose introduction to the network infrastructure sector was structured cabling, I've huge respect and admiration for the pioneering individuals and companies that have pushed the boundaries of what's possible with copper and optical fibre transmission media over the last 30 years or so. Their work and the products they created have played a massive role in ensuring that the data centre sector has become as successful as it currently is.

That said, over the last few years I've had the growing sense that structured cabling is not being given the respect it deserves as the foundation upon which everything else in a data centre is built. In fact, it increasingly feels like it is viewed as little more than a commodity purchase.

To find out whether this is the case we have assembled a panel of industry experts to discuss whether, given its vital role in ensuring a data centre's operational uptime, manufacturers and distributors of structured cabling should be doing more to shout about the importance of this element of the overall network infrastructure. Their responses make for fascinating reading.

Data centres are under tremendous pressure to deal with the energy demands placed on them by artificial intelligence (AI) and the heat generated by the components that make it happen. So, in this month's issue we have a special feature dedicated to cooling and climate management. Kelley Mullick of Iceotope examines how liquid cooling is helping to balance the power and sustainability demands of AI, while Harrison Barrett and Tony Cheales of Vantage Data Centers explain the need to drive forward and prioritise sustainable cooling solutions.

Turning our attention back to cabling infrastructure, this issue also contains a feature on fibre optic technology, with two excellent articles on the subject. Up first, Tony Walker of Siemon takes a closer look at what to consider when configuring a high-density optical fibre network. Tony is followed by a familiar face in Inside_Networks, Michael Akinla of Panduit, who looks at how increasing data speed is driving optical fibre developments in data centres.

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

Rob Shepherd
Editor

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Concerns that AI could replace existing jobs within mid-market companies are growing

According to research from Node4, job loss fears top the list of worries that IT decision makers have about artificial intelligence (AI) use within their organisation. It's also a common fear across each vertical sector covered within the report, with a substantial number of respondents in mid-market finance (36 per cent), private healthcare (27 per cent), insurance (27 per cent), retail (29 per cent) and transport (25 per cent) organisations feeling the same way.

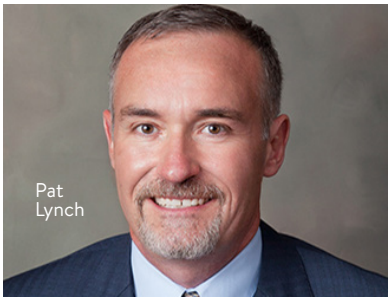

Geoff Barlow

The research also revealed that respondents are clear about the potentially negative impact that AI could have on their organisation's IT security. 30 per cent said that AI represents a top cybersecurity threat over the next 12 months, while 28 per cent believe AI could expose their organisation to new cybersecurity risks.

Geoff Barlow, product and strategy director at Node4, said, 'Respondents appear concerned that their organisation can't keep pace with the necessary retraining to mitigate against job losses in an AI-driven economy. They're also worried about the rapid rate at which new cybersecurity threats are emerging. My advice on both counts is to plan and prepare now. IT leaders should take a proactive stance by educating themselves and their organisation, evaluating the scope, scale and speed of their own AI adoption, putting the right processes in place to facilitate upskilling and engaging the necessary third-party support.'

Emerging data centre markets are key to supporting sector growth amid technology advancements

Ongoing power shortages are opening the door for development in emerging global data centre markets while fuelling rent increases in established markets across the globe, according to CBRE. Markets such as Northern Indiana, Boise, Idaho, Mumbai, Rio de Janeiro and Oslo are seeing rising demand for hyperscale development. CBRE expects the availability of power and land resources in these markets to drive investment and growth moving forward.


Pat Lynch

'Global power shortages are driving an unprecedented surge in data centre rental rates, particularly in North America, while AI advancements are having a significant impact on data centre demand,' said Pat Lynch, executive managing director at CBRE's Data Center Solutions. 'Preleasing data centre space well in advance of completion is commonplace across the globe, which underscores the robust demand in the market and the need for ongoing investment and development.'

Cloud resources have become biggest targets for cyberattacks

Cloud resources have become the biggest targets for cyberattacks, with software as a service (SaaS) applications (31 per cent), cloud storage (30 per cent) and cloud management infrastructure (26 per cent) cited as the leading categories of attack, according to research from Thales.

This comes as organisations continue to experience cloud data breaches. 44 per cent of organisations have experienced a cloud data breach, while 14 per cent reported having an incident in the last 12 months. Human error and misconfiguration continued to be the top root causes of these breaches (31 per cent), followed by exploiting known vulnerabilities (28 per cent) and failure to use multi-factor authentication (17 per cent).


Sebastien Cano

Sebastien Cano, senior vice president for cloud protection and licensing activities at Thales, said, 'As the cloud attack surface expands, organisations must get a firm grasp on the data they have stored in the cloud, the keys they're using to encrypt it, and the ability to have complete visibility into who is accessing the data and how it being used. It is vital to solve these challenges now, especially as data sovereignty and privacy have emerged as top concerns.'

Inside_Networks announces date for 2025 Charity Golf Day in aid of Macmillan Cancer Support

The Inside_Networks 2025 Charity Golf Day will take place on 21st May at the Hanbury Manor PGA Championship Course in Ware, Hertfordshire. As usual, the event will raise money for Macmillan Cancer Support and four ball teams will compete in a 'best 2 from 4' full handicap Stableford competition over 18 holes. There will also be a Beat the Pro competition and a Nearest the Pin contest. The golf will be followed by a three-course dinner and prizegiving with charity raffle.

Rob Shepherd, editor of Inside_Networks, commented, 'Now firmly established as one of the most popular events in the network infrastructure industry calendar, the Inside_Networks 2024 Charity Golf Day raised almost £10,000 for Macmillan Cancer Support. The work that Macmillan Cancer Support carries out is invaluable and I hope that the industry will unite once again for a great day of networking and competition at one of the UK's premier golf courses.'

To enter a team or get more information about various sponsorship opportunities available **CLICK HERE** to email Mark Cumberworth at Slice Golf and Events or call 07769 696976.

70 per cent of UK businesses expect a cyberattack within a year but only 35 per cent feel prepared for it

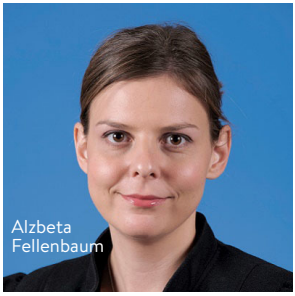
70 per cent of UK business leaders expect to suffer a cybersecurity incident in the next 12 months, but only 35 per cent of organisations feel well prepared to deal with one, according to Cloudflare. The research, conducted with over 4,000 business and technology leaders across Europe and 430 in the UK, found that 48 per cent of UK organisations have experienced at least one cybersecurity incident in the last 12 months, making it the most targeted country in Europe – higher than Germany (42 per cent), France (31 per cent) and Italy (25 per cent).


Christian Reilly

Christian Reilly, field CTO EMEA at Cloudfare, said, 'Thousands of UK business leaders are bracing themselves for growing cybersecurity threats that they feel ill-equipped to deal with. With incidents on the rise in both volume and frequency, preparation is key. Businesses that have previously faced attacks are seemingly on their guard, but industries that have not yet encountered such an incident are shockingly underprepared. Just because businesses have been lucky enough to avoid an attack so far, it doesn't make them immune in the future.'

Migration to full fibre essential for truly sustainable networks

Five key areas in the telecom sector, including migration from legacy copper networks, need addressing if optimal energy efficiency in fixed networks is to be achieved, according to the World Broadband Association (WBBA). It claims that fibre optic networks are the most energy efficient of existing broadband technologies and says that by decommissioning legacy copper and coaxial infrastructure operators can achieve significant energy consumption improvements.

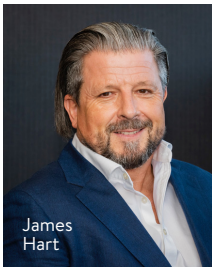

Alzbeta Fellenbaum

Alongside copper switch off, the industry must ensure network migration through simplified network architecture and new artificial intelligence (AI) solutions, as well as creating energy efficient facilities such as buildings and central offices. Network migration can also considerably reduce the need for server spaces and enable the decommissioning of entire buildings.

'Improving energy efficiency is a core element of most modern environmental sustainability policies,' said co-author Alzbeta Fellenbaum, principal analyst 5G and broadband pricing and strategy at Omdia. 'It's a strategy capable of minimising the environmental impact associated with fixed broadband connectivity. It's also a key component of a broader goal of achieving carbon neutrality and addressing environmental concerns.'

Adoption of AI is restricted by the lack of available power and facilities tailored for workloads

The data centres needed to support artificial intelligence (AI) within industry are significantly impacting power and water usage, presenting the sector with both challenges and opportunities for sustainability and resource management. This is according to the latest independent industry survey commissioned by BCS, which captured the views of over 3,000 senior data centre professionals across Europe.


James Hart

Over four-fifths of survey respondents reported experiencing an uplift in demand as a direct result of AI over the past year. However, 85 per cent believe that the pace of widespread adoption of AI is currently being restricted by the lack of available power and facilities tailored for AI workloads. Over 65 per cent of respondents reported that their organisations are regularly using generative AI, nearly double the percentage from their 2023 survey, and around 90 per cent of respondents expect their data centres to be more efficient as a direct result of AI applications.

James Hart, CEO at BCS, said, 'The environmental impact of this power usage is significant with many data centres are still reliant on non-renewable energy sources, despite efforts to transition to renewables. In addition to power usage, AI data centres also have a substantial impact on water resources used for cooling. Addressing these issues requires a multifaceted approach that includes transitioning to renewable energy, adopting innovative cooling technologies and leveraging AI for operational efficiency. As the demand for AI capabilities continues to grow, so too must our efforts to ensure that this growth is sustainable and responsible, balancing technological progress with environmental stewardship.'

NEWS IN BRIEF

Activate Learning Education Trust (ALET) has welcomed DataX Connect to its award-winning education/industry partnership, which is designed to give students a head-start into digital careers. The Digital Futures Programme recognises a chronic skills gap in the digital infrastructure industry and is now being rolled out to all ALET's University Technical Colleges (UTCs) and schools from September.

Chris Woodhouse is taking over as chairman of Node4. He succeeds Bill Thomas, who is stepping down after seven years in the role but remains on the board. Woodhouse is a highly experienced and respected leader with a proven track record of driving value across different businesses including Halfords, Debenhams and Homebase.

Aligned Data Centers' Phoenix and Chicago facilities have received Green Globes for New Construction certification from the Green Building Initiative (GBI). Both data centres received a rating of three Green Globes for their design and construction, demonstrating outstanding success in resource efficiency, environmental impact reduction and occupant wellbeing.

Intelligent buildings are imperat

Hi Rob

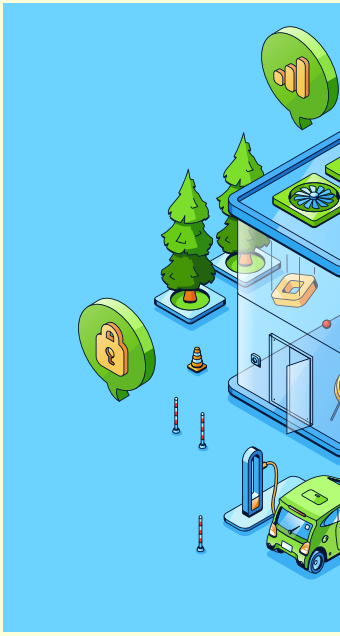
Climate change is now one of the most critical global challenges facing humanity, impacting not only life on earth but also the economy, health and society. Scientists warn that without more drastic intervention, the Paris Agreement pledge of limiting global warming to 1.5°C by the end of the century will be hard to achieve.

But while steps are being taken by all nations to reduce emissions from industry, farming and transport, little action is being taken to really make an impact in reducing carbon emissions from buildings. And yet the construction sector is responsible for a whopping 40 per cent of global carbon emissions and accounts for 30 per cent of the world's energy consumption.

Smart buildings, which seek to reduce environmental impact through efficient use of energy and resources, have been around since the 1990s. They have evolved significantly since then in line with advances in technology, most notably the mainstream adoption of the internet of things (IoT) and the convergence of information technology (IT) with operational technology (OT) and emergence of artificial intelligence (AI).

They provide real-time services based on occupancy and save energy by managing various functions such as lighting and heating, ventilation and air-conditioning (HVAC). Today these smart buildings, often termed Smart Buildings 4.0 are making headway in substantially reducing energy waste.

However, if we are to make a significant dent in the escalating level of carbon emissions from buildings and achieve net zero by 2050, radical action is needed.



Transforma Insights predicts that current smart buildings with automation systems integrated with HVAC and lighting controls can save nearly 10-20 per cent of total building electricity consumption, but this equates to a reduction in global energy consumption of a mere 3-5 per cent. While these figures do not account for the building envelope – architecture, materials, windows and shades – which would reduce overall global energy consumption further, current energy savings are still small beer compared to the huge percentage (approximately 30 per cent) of global energy currently consumed by buildings.

More than reducing emissions and energy waste, we need to actively reverse the trend and seek to heal the environment that we have collectively damaged over the last century. We need to usher in the next generation of intelligent buildings for the future or Smart Buildings 5.0. These regenerative buildings, which will start to come to the fore after 2030, will actively improve the ecosystem, enhance biodiversity and produce their

ive in tackling carbon emissions

own renewable energy, thus replenishing the energy they consume.

While architects and engineers will, of course, play a huge role in making Smart Buildings 5.0 a reality, advanced technologies will also play an integral role in managing, computing and automating the huge volumes of data that will underpin the functioning of these intelligent buildings. By 2030, IT/OT will have evolved to become fully merged and work as a single operating system – much like a computer.

IT systems will have shifted from being centralised to fully decentralised and advances in AI will evolve to swarm intelligence, with an emergent model inspired by collective behaviour that we would see in a swarm of bees. Each piece of software will act as an autonomous agent, working collaboratively with a heterogenous set of other autonomous agents. This model will be more scalable and will have no single point of failure, making it much more resilient and capable of handling the complex capabilities required to power intelligent buildings of the future.

Like all key technological evolutions, we cannot force change and time is needed for these new technologies to be properly developed and implemented. However, we can embrace this evolution, acknowledge the very real need for a drastic step change in our energy consumption – both at home and at work – and adopt a progressive mindset that will speed up the deployment of the next generation of smart buildings, bring in change and save our planet.

Xavier Mongin
Alcatel-Lucent Enterprise

Editor's comment

Within the pages of Inside_Networks you will often read about the efforts data centres are, quite rightly, making to lower emissions and become more sustainable. However, as Xavier points out, the same focus is not adopted when it comes to buildings. This is strange, as there is some incredible technology out there that could help them become more intelligent by reducing emissions and energy use. The term 'progressive mindset' is the key here and more building owners and managers need to adopt one.

What is the answer to n

Hi Rob

We recent held our latest BCS Breakfast Club meeting in conjunction with AVK-SEG in London, with participants including leading industry investors, operators, designers and consultants. It was universally agreed that the industry cannot rely on the National Grid to meet the increasing demand for power in the UK, despite the role of the data centre in society being critical in the global future of society and its ongoing digital transformation.

Discussions turned to current and future initiatives that the industry is assessing. Several attendees said that they are looking to find alternative locations that would previously have been unappealing to relocate or invest in. It is no longer a matter of finding a location with power but more about bringing power to a suitable location. There was agreement that the market had finally accepted that this was the way forward to mitigate National Grid constraints, with the drive being led by the hyperscalers with the Google site at Hertfordshire cited as a good example.

The issue of capacity, both current and future, was put forward raising the point that data centres rarely run at full capacity, and quite often at less than half, yet the power is 'held for them' by the National Grid – effectively reserved. This is also the case for new development proposals despite construction potentially taking up to 10 years.

The flipside to that is that with the investment costs being in the millions they must have confidence in the end power supply before starting. A suggestion that the National Grid implement a 'use it or lose it' approach, similar to the clawback scheme in Germany, was mooted and received a mixed response as it was felt that this was, at best, a short-term fix given the speed and growth of demand.

It was noted that whilst these types of

net zero?

initiatives may help mitigate the power availability issue they do not necessarily address the need for sustainability. Concerns were raised that if the industry fails to abide by the current self-regulation approach, then regulation may be forced upon them by government or local authorities that is less favourable.

Ben Pritchard of AVK-SEG then discussed the option of microgrids as a way of building-in both sustainability and resilience to power supplies, especially in areas where there can be a long wait for a grid connection. This entails a shift towards gas for primary power on-site but can also enable the data centre operator to be more imaginative when it comes to the power that drives their data centre.

He explained there are an increasing number of cases where the client has been waiting for years for a grid connection, leaving them with little choice but to explore workable and efficient alternatives. This approach can enable organisation to get their site up-and-running more quickly. This also repositions the industry as a hero that can help alleviate the broader power challenges by starting to help upgrade the existing power infrastructure and giving back power.

James Carmillet
BCS

Editor's comment

It sounds as though this was an interesting meeting of minds. I was particularly interested to hear that some data centre providers are turning their attention to locations that would have been reluctant to relocate to or invest in not so long ago because of power availability. Maybe this will also level up the distribution of data centres not just in this country but also in other places with similar issues.

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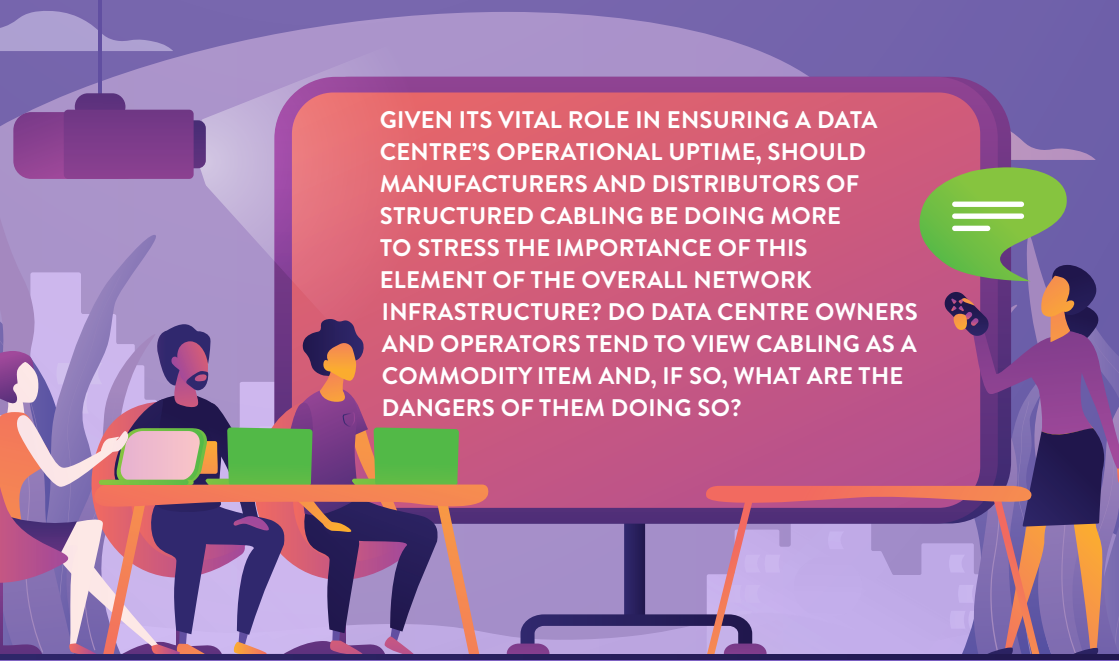
Solid foundations

Structured cabling underpins the smooth and reliable operation of all data centres, yet all too often owners, operators and users view cabling simply as a commodity. Inside_Networks has assembled a panel of industry experts to assess whether those responsible for providing cutting edge cabling systems should be doing more to highlight its vital role

Within data centres structured cabling is fundamental due to its impact on uptime, performance, scalability and reliability. It serves as the backbone of the entire network infrastructure, ensuring seamless data transmission and connectivity among devices and systems.

A quality structured cabling minimises latency, reduces the risk of data errors and supports high-speed data transfer. Conversely, poor quality cabling can result in data transmission errors, network congestion and failures, which disrupt services and lead to financial losses. Additionally, inadequate cabling infrastructure can hinder upgrades and expansions, limiting flexibility and future proofing capabilities.

Given how important structured cabling is to a data centre, it is often treated as a commodity – with a focus on cost rather than quality. So do manufacturers and distributors of structured cabling need to do more to emphasise its critical role, highlighting the long-term benefits of reliable, high-performance cabling as a strategic investment? Inside_Networks has asked a panel of experts to offer their opinions on the subject.



NIKOLAY EFIMOV
TECHNICAL MANAGER AT SIEMON

The global data centre market is set to grow at 11.5 per cent annually until 2030. This rapid expansion is driven by key technologies such as artificial intelligence, internet streaming and gaming, which all demand faster network speeds and increased bandwidth. Today, data centres continue to evolve into increasingly automated hubs that are required to handle a myriad of applications and compute and storage devices.

In light of these developments, manufacturers and distributors of structured cabling systems should indeed place more emphasis on the data centre cabling infrastructure because it is the foundation for reliable and consistent data transmission. If cables are unreliable, it can lead to transmission failures and disrupted operations.

Investing in quality cables and proper installation can reduce long-term costs by decreasing the need for frequent maintenance and component replacement. Dealing with a reputable supplier that has the highest quality standards and proven tested products is essential, as data centres can push products to their limits. Quality is paramount to maintaining performance and reducing any risk of downtime.

A high-quality structured cabling system can accommodate future growth and changes in technology. It allows for easy addition of new equipment and network expansion without significant reconfiguration, costs and downtime. A scalable infrastructure can easily adapt to ongoing growth, new speeds or business models.

A structured approach to managing cables within the data centre also simplifies cable management, maintenance and troubleshooting. By minimising cable clutter and providing consistent administration, structured cabling helps reduce the risk of accidental cable disconnections and other human errors that can lead to network downtime, supporting overall reliability and availability of services within the data centre.

Overall, viewing cabling as a commodity item can lead to significant operational and financial drawbacks. It is essential for data centre owners and operators to recognise the critical role that high-quality cabling, design and installation play in ensuring reliable, high-performance and scalable network infrastructure. Investing in good cabling upfront can save time, money and headaches in the long-term.

> 'IT IS ESSENTIAL FOR DATA CENTRE OWNERS AND OPERATORS TO RECOGNISE THE CRITICAL ROLE THAT HIGH-QUALITY CABLING, DESIGN AND INSTALLATION PLAY IN ENSURING RELIABLE, HIGH-PERFORMANCE AND SCALABLE NETWORK INFRASTRUCTURE.'

ANDY HIRST

MANAGING DIRECTOR CRITICAL INFRASTRUCTURES AT SUDLOWS

All aspects of a data centre facility are critical, and issues with any element can have a partial or catastrophic effect. However, the uptime of these facilities does seem to be more focused on the mechanical and electrical (M&E) infrastructure.

I appreciate that this is not always the case. Lessons learnt over the years through the increase of knowledgeable engineers means the full infrastructure, including the structured cabling, is focused on. But this seems to be more prominent with the larger corporations and hyperscalers.

It is noticeable how the void is getting wider between the larger facilities that have clearly invested in, and produced, a hefty scoping document itemising all aspects of their facility's infrastructure, down to the specific colours of patch leads, compared to the smaller facilities where, apart from the cooling units, uninterruptible power supplies (UPS) and generators, all other aspects such as the structured cabling seem an inconvenience.

It is quite interesting on some projects we work on, where after various conceptual workshops on the M&E infrastructure when the structured cabling discussions start, it is quite common that no specifications are available and often there is no interest in producing one. Fortunately, we have in-house data engineers to advise on the best solution, but other data centre specialists may not have this capability.

Maybe reports of catastrophic failures on some of the larger critical equipment overshadows the less frequent, smaller failures structured cabling defects can cause. But a failure is a failure surely?

Maybe the manufacturers and distributors of structured cabling play a part in this aspect of a data centre not being considered as critical. Perhaps the M&E manufacturers have done such a good job in terrifying owners and managers with case studies of failure, that this has become the priority!

So, it may be a consideration for structured cabling manufacturers and distributors to think about going forward. They should bear in mind not just the best price or quality of the cable, but the importance of the way it is installed and consider any resilience required to prevent or reduce the risk of failures.

'MAYBE THE MANUFACTURERS AND DISTRIBUTORS OF STRUCTURED CABLING PLAY A PART IN THIS ASPECT OF A DATA CENTRE NOT BEING CONSIDERED AS CRITICAL. PERHAPS THE M&E MANUFACTURERS HAVE DONE SUCH A GOOD JOB IN TERRIFYING OWNERS AND MANAGERS WITH CASE STUDIES OF FAILURE, THAT THIS HAS BECOME THE PRIORITY!'

MICHAEL AKINLA

BUSINESS MANAGER NORTHERN EUROPE AT PANDUIT

Structured cabling is crucial in data centre design. Collaboration between manufacturers, distributors and data centre builders/owners is essential to manage risks and ensure reliable connectivity.

Hyperscale operators need high-quality cabling to avoid data disruptions, and close partnerships mitigate supply chain risks. A positive is that hyperscale operators adhere to strict specifications, understand the technology and prefer working with trusted partners. We could always be talking to more people to get that vital message across.

For our key data centre partners, for which we supply a wide range of the physical infrastructure including structured cabling, it's a crucial piece of the jigsaw. Today's high-performance central processing units (CPUs) and graphics processing units (GPUs) and mission critical applications mean the structured cabling must be of the highest standard.

Massive growth in data centres is forecast to support artificial intelligence, whether in local data centres or sitting in the cloud. The industry is talking about short-term investment of $1tn in data centres around the world.

With that level of spend there will be challenges across the supply chain and we work very closely with our data centre partners to ensure standards-based structured cabling and all other infrastructure is baked into the plans as an essential support platform. This includes commitment on raw material sourcing, transportation, manufacturing, quality and final supply.

Infrastructure must help reduce the previous rip and replace cabling strategies. As increasing numbers of data centres upshift to 100Gb/s, 400Gb/s or 800Gb/s data connectivity, cabling infrastructure is becoming more critical to the data centre operation, which is amplifying its criticality to the data centre owners and users.

The growth in copper use and subsequent pressure on supply has driven up copper prices by 20 per cent this year, while optical fibre manufacture is also under huge pressure. Collaborative partnerships are critical if data centre owners are to remain competitive in deploying and delivering facilities on time and budget.

Infrastructure suppliers need to get a clearer message across in the market, so data centre operators are fully aware of the factors to consider and the timelines required. We are building closer collaborations and we and distribution need to be a part of the team. And if we're not, it's a high-risk strategy for the data centre builder and operator.

'INFRASTRUCTURE SUPPLIERS NEED TO BE GETTING A CLEARER MESSAGE ACROSS IN THE MARKET, SO DATA CENTRE OPERATORS ARE FULLY AWARE OF THE FACTORS TO CONSIDER AND THE TIMELINES REQUIRED.'

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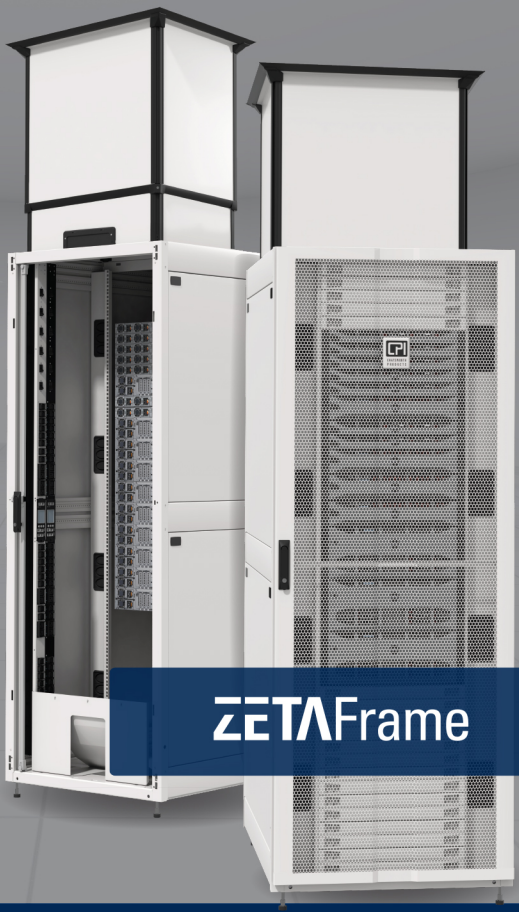

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CHRIS FRAZER

PRINCIPAL CONSULTANT AT LAYER ZERO SERVICES

Many structured cabling system manufacturers and distributors have stressed the importance of cabling for years. I'm not sure that doing any more will make much difference.

I think that some data centre users see cabling as a commodity item, but many others certainly don't – they tend to specify the premium brands with a defined set of products. One danger of not paying enough attention to cabling, or viewing it as a commodity item, is that cabling may be specified that doesn't support near-future requirements, which might have otherwise been anticipated.

Cabling has been a victim of its own success. I'm unaware of any recent installations where cabling didn't perform to the level it was designed for, so many may simply expect it to work.

Given this, I strongly recommend paying careful attention to containment designs. Data centres are, typically, designed as robust facilities that are expected to last for many years. It is possible that several changes to cabling requirements will occur in the lifetime of the facility, because of data rates or quantities of cores required to support the ever-evolving devices to be connected. It looks like artificial intelligence may be the latest, demanding beast!

A well-designed containment system will allow changes to be made relatively quickly with a little risk to existing equipment. Separate systems for optical fibre and copper are recommended. A decent amount of spare capacity is essential, as is access. Containment installed tight to other infrastructures, where you'd be lucky to get a finger between them, let alone a decent amount of hand space, must be avoided. Routing is also vital – tortuous routes that make cabling installation difficult shouldn't be used.

Structured cabling provides an excellent transmission medium that is usually, from a performance perspective, ahead of the bandwidth requirements of devices that are to be connected. However, for data centre environments, the containment must be designed and installed to allow multiple changes of cabling in a safe and secure manner that reduces risk to equipment and cabling that may still be operational. No-one wants to see cables being loosely installed in floor voids, just to update connectivity!

'CABLING HAS BEEN A VICTIM OF ITS OWN SUCCESS. I'M UNAWARE OF ANY RECENT INSTALLATIONS WHERE CABLING DIDN'T PERFORM TO THE LEVEL IT WAS DESIGNED FOR, SO MANY MAY SIMPLY EXPECT IT TO WORK.'

CARSTEN LUDWIG

GLOBAL DATA CENTRE MARKET MANAGER AT R&M

Structured cabling is definitely not considered sufficiently important. One reason for this is the fact that cabling accounts for a relatively modest share of overall data centre investment budget, which seems to be a key driver for prioritisation.

However, structured cabling is an absolute necessity for every technology vital to data centre operations – from access, connectivity and cooling to IT equipment, power and physical space. Cable connectivity can be considered as a data centre's central nervous system, or main highway to the end user. After all, if connections fail, so do applications. Cooled air or electrons feeding servers are important, but certainly not more important than cables.

Structured cabling and software are both pretty much 'invisible' and therefore often overlooked, but they're key to understanding and improving data centre design and operation. Cabling and software can be used to map aspects such as availability across technologies, power consumption and operational efficiency and reliability. Data centre operators, end users and governments will be placing increasing emphasis on this.

The cabling's central nervous system and carefully configured software allow you to map everything to everything else. Once you've defined all your key performance indicators (KPIs) across different technologies, you can link them to data flows.

For example, in a recent brainstorming session with my team we came up with a new approach to Power Usage Effectiveness (PUE) measurement, based on real-life data centre usage. By precisely syncing power distribution unit (PDU) metering to measurements of Mb/s flowing through servers' access points, you can precisely work out 'power usage per Mb operated' at server level. Based on such insights, you can pinpoint the best optimisation measures.

By taking such approaches to measurement, connectivity moves beyond the physical layer level – where's it's regarded in the same way as concrete in a building's foundation. Instead, it brings a new way to look at the usage of resources across technologies. In this way, cabled connectivity becomes the vital bridge between the once disparate non-compute and compute worlds. A David that helps manage the data centre Goliath!

'STRUCTURED CABLING IS DEFINITELY NOT CONSIDERED SUFFICIENTLY IMPORTANT. ONE REASON FOR THIS IS PROBABLY THE FACT THAT CABLING ACCOUNTS FOR A RELATIVELY MODEST SHARE OF OVERALL DATA CENTRE INVESTMENT BUDGET, WHICH SEEMS TO BE A KEY DRIVER FOR PRIORITISATION.'

BARRY ELLIOTT
DIRECTOR AT CAPITOLINE

In our experience of data centre design, structured cabling accounts for 6-7 per cent of the total fit-out cost. It is outweighed, as you may have guessed, by power and cooling and sometimes fire detection and suppression systems as well.

Perhaps not surprisingly it is difficult to get data centre managers and owners to apply more than 6-7 per cent of their attention span to the needs of the communications cabling. Very often the structured cabling isn't part of the fit-out at all and left to future tenants to do their own thing.

Cabling is very often seen as a commodity that someone will sort out in the future. In our data centre training provision, we make the point that power, cooling and cabling are the three key elements and if you don't get them right nothing is going to work properly. After the build we are often called in to certify the data centre to TIA-942 or EN 50600, where Rating or Class 3 is the usual minimum target. Typical cabling mistakes are:

- A lack of dual telecommunication cable inputs to the building at least 20m apart.
- One main distribution area (MDA) but no dual paths of cabling thereon to the horizontal distribution area (HAD).
- A hazy view of what Category 6 or Category 6A actually means.
- An even hazier view of optical fibre types (isn't fibre just fibre?), with no concept of what terms like OM3, OM4, OS1 etc mean.
- A complete lack of cabling documentation and plans.
- A complete lack of understanding of UK and European Union fire standards for cabling in buildings.
- A lack of understanding of the need for fire penetration seals where cables go through fire barriers.

All the above points lead to problems for data centre owners, managers and users, not just in terms of data centre certification but practical management problems in the operation of the data centre.

What should cable manufacturers and suppliers be doing about this? Education, education, education. Don't just try to sell product – explain how cabling needs to be planned in as part of data centre's critical infrastructure.

'IN OUR EXPERIENCE OF DATA CENTRE DESIGN, STRUCTURED CABLING ACCOUNTS FOR 6-7 PER CENT OF THE TOTAL FIT-OUT COST. IT IS OUTWEIGHED, AS YOU MAY HAVE GUESSED, BY POWER AND COOLING AND SOMETIMES FIRE DETECTION AND SUPPRESSION SYSTEMS AS WELL.'

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How dense is dense enough?

With artificial intelligence (AI) exploding, network professionals require high-density fibre optic networks, but choosing the right cabling can be tricky. Tony Walker of Siemon takes a closer look

AI applications require massive data transfer and are pushing traditional networks to their limits. In 2023 the global AI market was valued at $142.3bn, and it is projected to reach nearly $2tn by 2030. This rapid growth is being driven by organisations across various industries, which are leveraging AI technologies and models to increase operational efficiencies, reduce costs and increase productivity.

GAME CHANGER

New technologies have consistently pushed the demand for faster network speeds and bandwidth. However, the emergence of AI is the biggest game changer the industry has witnessed in decades. Supporting AI applications means that network speeds at the server are now reaching 100Gb/s and well beyond. Server speeds of 100Gb/s are required to support text-based generative AI (GenAI), trained edge inferencing and machine learning, while 200Gb/s and 400Gb/s are required to support AI training models. For high-performance and quantum computing we are looking at 800Gb/s to 1.6Tb/s.

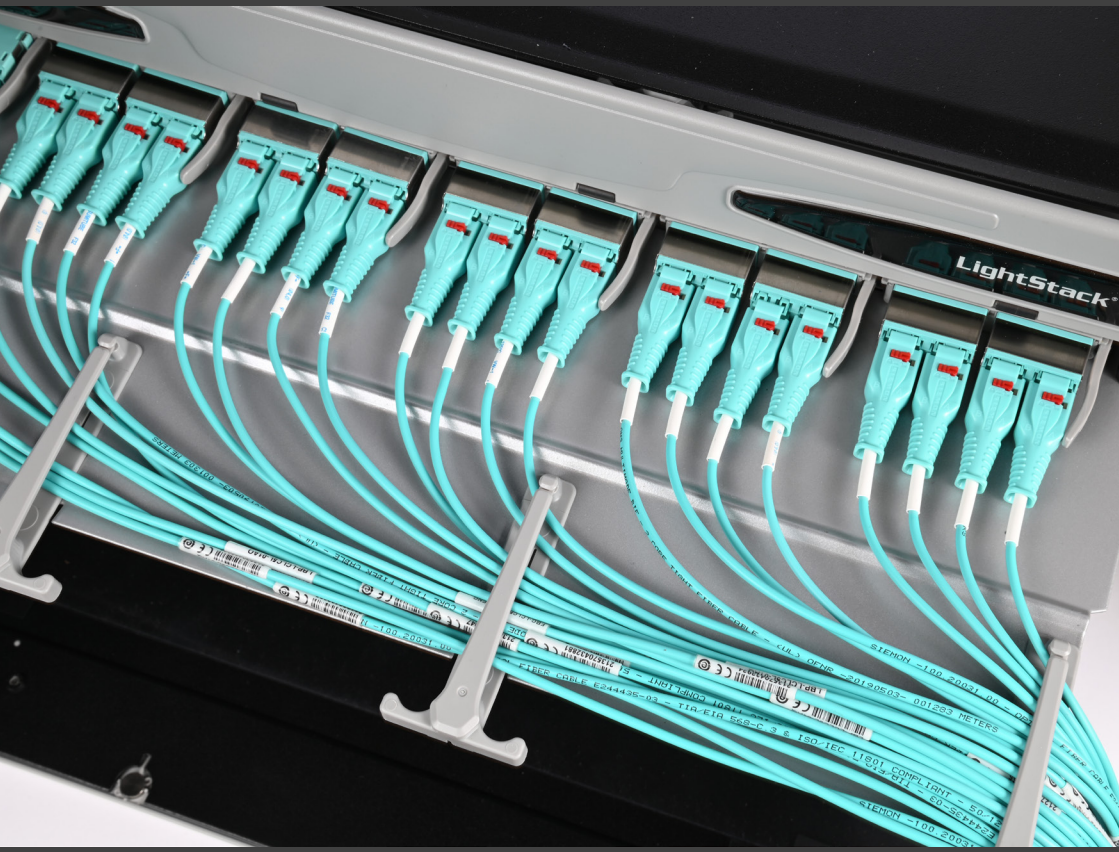
Fuelled by the rapid adoption of AI across various industries, the data centre market is experiencing significant growth. This surge is driven by the need for robust data centre infrastructure to support these powerful AI applications. According to Global Market Insights, the global data centre market is set to grow at 11.5 per cent annually until 2030. The revenue for data centre infrastructure alone reached $22.6bn in 2023 and this figure is predicted to double by 2030.

Today, major network operators are investing in high-density fibre infrastructures to prepare for the growth in bandwidth required by AI services. Decisions on the right cabling and connectivity solution must always be based on the level of density a network really needs. Some of the key questions that must be answered upfront include what level of density does a network really need? Should network decisions be made based on specific applications? Should a standardised platform be used across the entire network? But first, what does high-density really mean?

DEFINING MOMENT

An ultra-high-density fibre network deploys fibre connectivity solutions that support at least 144 LC fibres per rack unit, whereas a high-density network is supported by a fibre connectivity system that supports 72-96 LC fibres per rack unit. Despite the high fibre count that these systems enable, they are designed for easy port access and network management.

Whilst advancements in AI and its



bandwidth demands suggest a need for ultra-high-density fibre solutions across networks, many organisations that have standardised on it are not utilising it to its full capacity. Instead, they are overbuilding their network at excessive cost. Although AI is advancing swiftly, the majority of business applications are still very well served by a high-density fibre system.

ONE SIZE DOESN'T FIT ALL

The solution to this dilemma lies in complementary systems. This means businesses should standardise on a high-density platform for most applications, as well as standardising on an ultra-high-density platform to serve the demands of heavy compute AI.

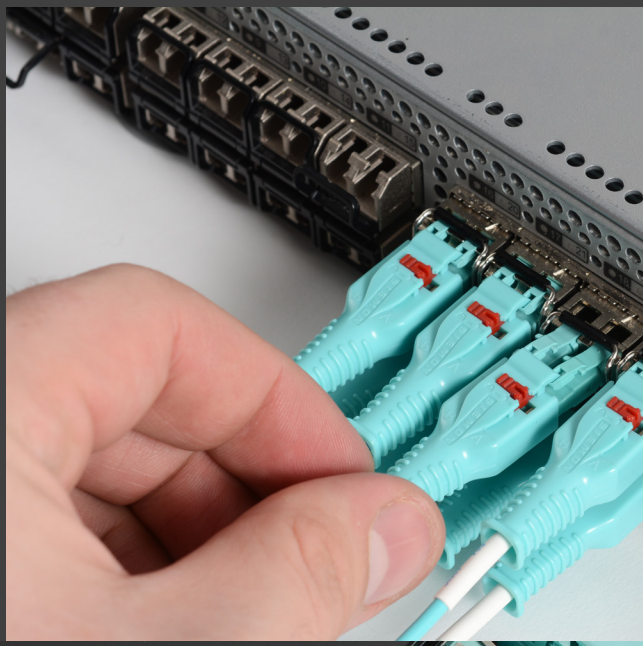
There might be drawbacks to deploying ultra-high-density and high-density solutions at the same time, but this approach offers a key advantage – cost savings. By not overbuilding the network from the outset, significant cost benefits can be achieved. Additionally, if both ultra-high-density and high-density platforms are compatible, organisations can seamlessly upgrade to an all ultra-high-density network in the future.

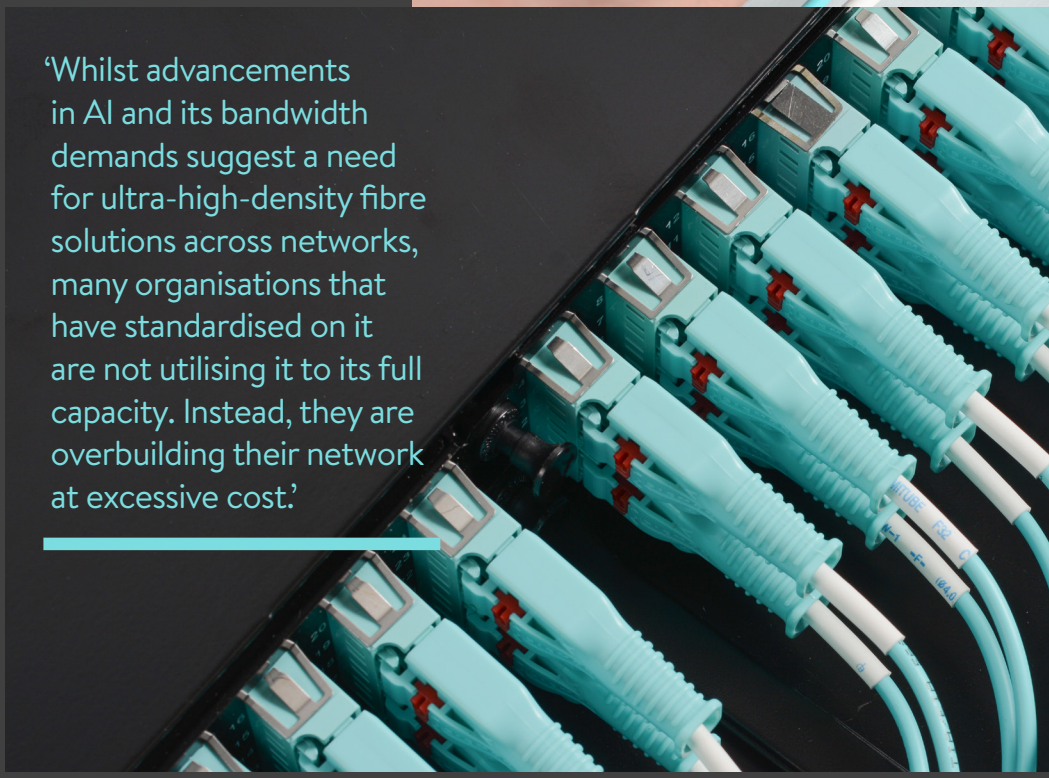
KEY CONSIDERATIONS

When deciding if to deploy an ultra-high-density fibre connectivity solution there are three main factors to consider:

• Fibre applications and termination
This includes how you will terminate the fibre cable and connectors. Will you use factory made connectors or terminate them on-site? How many individual fibres do you need to manage, and how many total fibres will you be deploying?

I recommend using pre-assembled fibre optic cables (trunks) with factory made connectors. This allows for a quick and easy network set-up using special plug-and-play modules. These modules connect multiple fibre connectors (multi-fibre) to individual LC connectors, which reduces the number of individual





'Whilst advancements in AI and its bandwidth demands suggest a need for ultra-high-density fibre solutions across networks, many organisations that have standardised on it are not utilising it to its full capacity. Instead, they are overbuilding their network at excessive cost.'

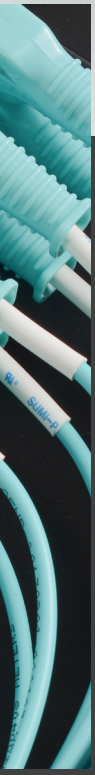
cables between rack-to-rack, row-to-row or active device-to-active device.

• Fibre density

This includes questions around the number of fibres that are being deployed (now and in the future) and how many fibres are being terminated at the rack unit. The answers to these questions will decide how much density is needed per rack and, of course, an ultra-high-density fibre solution makes most sense if a large amount of fibre is needed or will be terminated in the future.

• Ease of use

How easy is it to install the fibre and how easily can moves, adds and changes be completed? Does the solution have innovative fibre management and does it offer multiple termination types? A thorough evaluation of the solutions available on the market will determine the best fit for your deployment.



BEST OF BOTH WORLDS

Instead of a one size fits all approach, network professionals deciding on a high-density fibre cabling solution must consider the application requirements first. This will guide the choice for either a high-density or an ultra-high-density fibre system. Ultra-high-density solutions excel in data centres with heavy workloads like video rendering. However, for most network deployments this might be overkill. Leveraging a complementary solution allows businesses to meet the needs of most applications with a high-density solution, whilst using an ultra-high-density solution for very specific applications. ■

TONY WALKER

Tony Walker is global fibre product marketing manager at Siemon. He has over 20 years of experience in the passive infrastructure market and has previously spent time with Legrand, TE/CommScope and Huber+Suhner in various market facing leadership roles. Walker is focused on the direction of the passive infrastructure marketing over the next five years.

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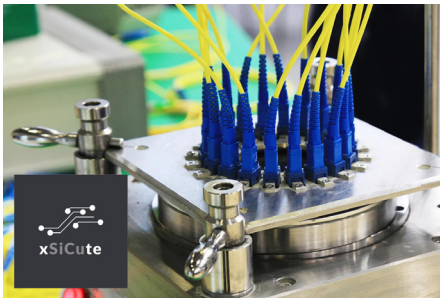
Today, the pre-termination of fibre optic cables for data centres is the de-facto choice, whether for a complete new build or the expansion of an existing facility.

xSiCute provides a level of quality control not available with on-site termination, particularly as singlemode fibre and MPO cassette-based infrastructure has become prevalent. Singlemode fibre is far more exacting, due to the 9µ core, compared with 50µ for multimode variants such as OM4.



Pre-termination reduces the amount of material waste and packaging on-site, which is useful as many data centres do not allow cardboard in data halls. It also minimises time on-site, which consequently means less time to complete overall.

To realise all these benefits, it is essential to have a local partnership with a pre-termination house that can accurately interpret and document the requirements, accommodate design changes, and provide good advice and eliminate costly errors.

That is why xSiCute has been successfully delivering high quality pre-terminated assemblies to UK data centres for over 20 years.

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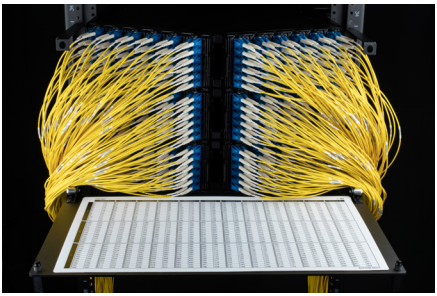

Introducing AFL's cutting-edge fibre optic cabling systems. Whether you seek uninterrupted network performance at scale across multiple dispersed locations, or you wish to transform your artificial intelligence (AI) optimised data centre's underutilised white space into a strategic, efficiency enhancing asset, we 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.

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For 20 years HellermannTyton has been a pioneer in pre-terminated infrastructure with its RapidNet solution. RapidNet is the pre-terminated, pre-tested cassette-based plug and play system developed by HellermannTyton and designed to deliver high performance, while improving the ease and speed of infrastructure deployments.

HellermannTyton has now launched RapidNet ULTRA, taking the existing data centre optical fibre solution beyond today's requirement. It offers an even greater fibre density, while accommodating very small form factor connectivity and supporting tomorrow's requirements for high bandwidth, advanced network architectures and Ultra Ethernet.

With a range of cassette formats and fibre assemblies, RapidNet ULTRA delivers high performance and fibre capacity to meet the demands of the modern data centre.

To find out more about RapidNet ULTRA **CLICK HERE.**

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Networks Centre

Networks Centre offers a range of spooled optical fibre solutions. Applications include:

- Optical time domain reflectometer (OTDR) launch/tail leads.
- Fibre bumps that are used by some service providers to add latency to those not subscribing to their premium service offering.
- Test rigs to simulate a link between data centres to test dense wavelength division multiplexing (DWDM) connectivity.
- Latency equalisation to ensure cabling is not responsible for any competitive advantage between users.

Usually, it's only latency equalisation that requires very accurate measuring and matching of fibre cores and types. It must be length-tested using specialised equipment because an OTDR is not accurate enough for the tolerances often requested.

Networks Centre offers connectivity solutions for all the above applications including latency equalisation to comply with Article 1 of (EU) 2017/573 where MIFID II states, 'Trading venues shall provide all users which have subscribed to the same colocation services access to their network under the same conditions, including as regards space, power, cooling, cable length, access to data, market connectivity, technology, technical support and messaging types'.

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Siemon

Siemon's new LightStack and LightStack 8 ultra-high-density fibre plug and play system delivers superior density, port access and cable management in a sleek, modern platform. This makes it ideal for today's advanced data centre or enterprise networking environments.

The black LightStack enclosure and connectivity range is the Base-12 format, while the grey LightStack 8 enclosure and connectivity range is the Base-8 format. Both configurations support singlemode and multimode fibre.

Siemon's innovative new solution supports up to 144 fibres per rack unit in a 1U enclosure and enables easy access and management of connectivity from the front or rear. It offers various mounting options and high-capacity management clips that are designed to support the maximum capacity of cables, as well as simple access. The new system includes a range of plug and play transition modules and pass-through adaptor plates designed to deliver a level of performance exceeding today's standards.

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Leading light

Michael Akinla of Panduit looks at how increasing data speed is driving optical fibre developments in data centres

Fibre densification within data centres, with doubling data speeds every few years and increasingly compact connectivity, is challenging current technology and network designs. Greatly increased power requirement to the servers coupled with emissions compliance is creating enhanced integration of cable topologies.

ON THE UP

Emerging technologies, such as Base-16 fibre optic cabling for multimode, 400GBASE-SR8, is creating a stir in the market by enhancing fibre density to servers. Furthermore, this advancement necessitates additional innovations to fully realise its benefits. Base-16 represents a significant step forward in comparison to existing solutions like Base-12 and Base-8 fibre solutions.

One significant distinction from Base-8 technologies is that the 16 fibres in a Base-16 MPO operate consecutively, with eight used for data transmission and eight used for receiving. Additionally, the offset connector key guarantees that it can only connect with Base-16 components, eliminating crossed connections. Connection to Base-8 and Base-12 components cannot be directly connected and requires conversion media.

TAKING THE ADVANTAGE

Base-16 technology offers a significant advantage in that it can optimise multimode short reach 400Gb/s deployment, 400GBASE-SR8, by minimising back reflection and optical return loss through the use of an angled polished MPO connector. Targeting 400Gb/s deployed on SR8 provides a platform that can break out into separate 50Gb/s regions. Utilising the growing variety of cassettes available that take 16 fibres and break them out into the LC equivalents allows installers to pop out 50Gb/s at the server.

Currently, a provider is usually working on a scenario of 400 Gigabit Ethernet switch to 50 Gigabit Ethernet server applications, a pod of 16 cabinets with 32 servers per cabinet and one 50 Gigabit Ethernet link to each server, with the traditional 16 cabinet deployments. This utilises top of rack (ToR) switches on every single cabinet and

supports a stack of 32 or more servers. It is an expensive deployment strategy.

By utilising the latest higher density breakout technologies for 400Gb/s to 50Gb/s breakout, systems architects and installers can potentially exploit middle of rack (MoR) switch deployment using 400Gb/s ports with breakout capability. Therefore, rather than having ToR switches in every cabinet, there would be a much reduced number of MoR switches, with 400Gb/s to 50Gb/s breakout capability installed to work with these Base-16 technologies. This allows users to deploy 400Gb/s SR8 and push that down to 50Gb/s to the server.

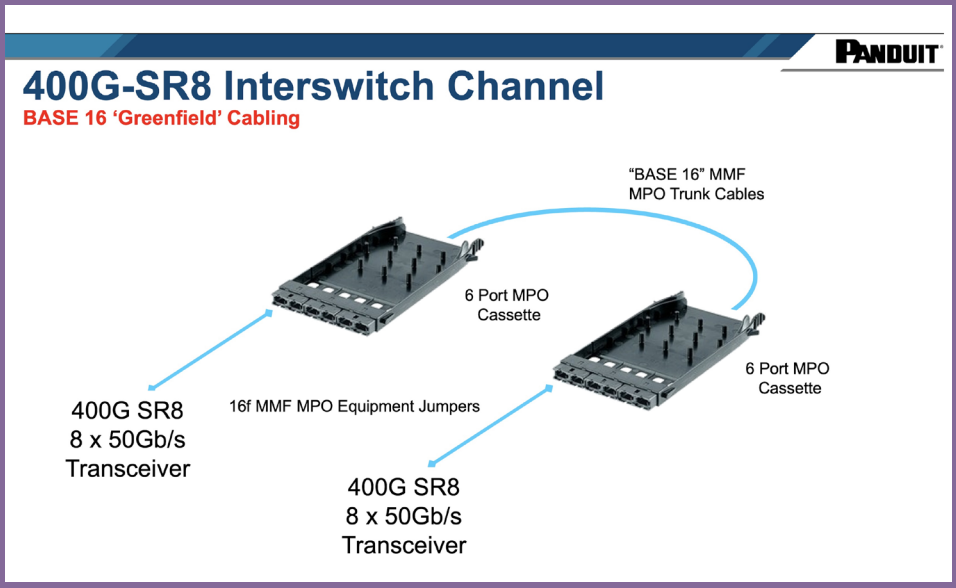
SUPPORT STRUCTURE

Increasing bandwidth and fibre speeds impact variously across the infrastructure architecture. To ensure that the infrastructure ecosystem operates to its potential, faster racks of servers will require specific support systems such as intelligent power distribution units (iPDUs).

Large organisations with multinational locations, be that enterprise or data centres, tend to consolidate their infrastructure for purchasing and installation strategy. Increased power density in the rack environments or, possibly, local utility supply may require the capability to change the voltage phasing of the racks to support the servers and aligned systems.

The latest universal (monitored switched) PDUs (uPDUs) provide this easily switchable power capability to handle input voltages ranging from 208V-415V in 1PH or 3PH supply and therefore can be used globally. Installers simply select the facility side cord set to match the power needs of the installation, allowing the user to scale-up the power capacity as the requirement grows.

Normally, cabinets have two PDUs feeding the equipment. Installers can now, without changing any connections to the uPDU, shut down the uPDU, having first transferred all the equipment to



'Increasingly dense fibre and copper cable environments can be easily documented and mapped, allowing auditing at any time in the infrastructure's lifecycle. Cable network mapping is essential and can also greatly reduce human error during cable disconnects, which are a cause of numerous system downtime cases.'

the secondary PDU. The power in lead can then be removed and changed to whichever current rating or phase is required and then powered back up. The uPDU can also be managed remotely via an in-built web server and connected to data centre infrastructure management (DCIM) software to facilitate off-site data collection and alert activity.

FULL FUNCTIONALITY

Several industry leading original equipment manufacturers (OEMs) have developed dashboard capabilities that are adding even greater value to users. Connecting uPDUs to dashboards, such as Cisco Nexus, allows data collection, which is adding capabilities to users, especially in respect of sustainability and compliance.

Data collection is important for an increasing variety of factors – however, sustainability and compliance are chief among the goals of many organisations. So, from a sustainability point of view, users can look at the completed state and view the power usage of individual systems, which is key.

Also, the data will show the CO2 effectively being consumed within the actual environment. Gathering real time data is becoming central to organisations' reporting capabilities, whether that is internal or externally mandated. Using structured data in this way allows organisations to see exactly how key factors such as power are changing over time. It can then provide the platform for change management to reduce CO2 emissions and effectively use power.

RULES AND REGULATIONS

Compliance-wise there are several different rules that a data centre must work within. The latest dashboards allow administrators to set those rules and the system can determine and respond where the environment is going above or below. Another key factor is the what-if scenarios. This is important because if there are changes in the architecture, and there are new devices that are more power efficient to use with less power and CO2, these what-if scenarios can help guide the user on what to recommend next and deploy.

Increasingly dense fibre and copper cable environments can be easily documented and mapped, allowing auditing at any time in the infrastructure's lifecycle. Cable network mapping is essential and can also greatly reduce human error during cable disconnects, which are a cause of numerous system downtime cases.

Simply applying two extra labels at source to every single patch cord has effectively changed the game in logging and tracing cables. Using a software app that allows installers and maintenance engineers to scan the labels with a Bluetooth scanner, associate the barcode with the port and then save it to a database creates a profile of exactly what is patched into the environment. This capability is a very cost-effective way of documenting what's in an environment and keeping it up to date and relevant.

THEORY OF EVOLUTION

The continued evolution of rack environments and cable density benefits from reduced cable diameters and cable weight, with Base-16 fibre offering high bandwidth and breakout lane capabilities. More traffic and faster data rates mean that any downtime could be a major problem.

However, there are intelligent solutions to capitalise on the higher speeds and more powerful server capabilities. Base-16 is facilitating faster throughput for higher data rates, which are increasingly needed in today's data intensive applications, whilst the need to report on sustainability improvements requires more data capture in the IT equipment environment itself. Manufacturers and suppliers to enterprise and data centres are aware of their requirement to provide platforms that facilitate data gathering across the infrastructure, allowing customers to better integrate systems and maximise their resources. ■

MICHAEL AKINLA

Michael Akinla is business manager central Europe north at Panduit. He brings over 20 years' experience in the deployment of Panduit's most complex solutions and has extensive experience in working with several large global accounts to bring about significant improvements in terms of higher bandwidth deployments, reduced Power Usage Effectiveness (PUE) and lower total cost of ownership (TCO).

Excel Networking Solutions celebrates the spirit of the Paris 2024 Olympic and Paralympic Games with The Excel Games

With the Paris 2024 Olympic and Paralympic Games now underway, Excel Networking Solutions has launched The Excel Games, which will run until 8th September. This competition aims to engage customers through a series of interactive online games and events, fostering a sense of community and competition in the spirit of the Olympics.

The Excel Games will offer customers the chance to participate in a variety of online activities, earn points and gain entries into a prize draw. 'The Excel Games is a tribute to Paris 2024,' said Ross McLetchie, UK sales director at Excel Networking Solutions. 'The Olympics represents the pinnacle of global competition and achievement, values that resonate deeply with our commitment to excellence and innovation. Through this competition, we aim to engage our customers in a fun and meaningful way, while celebrating the spirit of the Olympics.'

Telehouse raises money for local Tower Hamlets charities

A team of 25 employees from Telehouse Europe participated in the Saucony London 10K run recently, raising £6,000 for two local charities – First Love Foundation and Leaders in Community. The funds raised will help to contribute to their essential work.

First Love Foundation started as a foodbank but has evolved to tackle the deeper issues of poverty and crisis, offering rapid, person-centric support to help individuals get their lives back on track. Leaders in Community focuses on empowering young people in Tower Hamlets, one of London's most deprived areas. Through its youth leadership and youth social action initiatives, it equips young people with the skills and opportunities to overcome barriers, build careers and contribute positively to their community.

Mark Pestridge, executive vice president and general manager at Telehouse Europe, said, 'At Telehouse, we strongly believe in giving back to the communities we are part of. Our participation in the Saucony London 10K and our ongoing support for First Love Foundation and Leaders in Community reflect our dedication to making a positive difference.'

Keysource appoints Maria Papantoni as sustainability lead


Maria Papantoni

Keysource has appointed a head of sustainability as part of its ongoing focus on sustainable solutions across all elements of its services. Maria Papantoni brings with her over a decade of environmental design and engineering experience and qualifications. In her new role she will head-up Keysource's new sustainability division, made up of industry experts who will deliver services across the customer asset lifecycle to develop, improve and implement more sustainable services and solutions, ensuring alignment with the client's goals and targets.

Jon Healy, chief operating officer at Keysource, said, 'Our decision to recruit Maria highlights the growing demand for sustainability led solutions and services within our sector. The collective need to deliver to net zero targets is intensifying, the regulatory landscape is developing and organisations are under pressure to reduce carbon and meet sustainability goals, with consumers and investors demanding greater environmental responsibility from businesses. Getting the right advice is absolutely key to success and the appointment of Maria strengths our ability to provide this to our customers.'

Siemon appoints Trey Somers as vice president of product management

Siemon has appointed Trey Somers as vice president of product management. In this role, Somers will lead Siemon's global product management team and drive the development of innovative solutions that meet the evolving needs of the market. He will also collaborate closely with the Siemon marketing team to align product development with current market needs and developing industry trends.


Trey Somers

With a distinguished career spanning over two decades in the industry, Somers brings a wealth of experience. Most recently, he served as managing director at Align Communications, where he successfully led a team delivering smart building solutions to major financial institutions across the globe.

'We are thrilled to welcome Trey to the Siemon team,' said Henry Siemon, president and CEO at Siemon. 'His deep industry knowledge and proven track record in product management make him an invaluable asset to our organisation. We are confident that under Trey's leadership, Siemon will continue to deliver cutting-edge solutions that drive customer success.'

Somers added, 'I am excited to join Siemon and contribute to the company's continued growth and success. It has a strong reputation for innovation and customer focus and I look forward to working with the team to develop groundbreaking solutions that address the challenges and opportunities of today's dynamic market.'

CHANNEL UPDATE IN BRIEF

AFL has opened its Poland Manufacturing Facility located in MDC² Park, Gliwice, Poland. Poland's central location, skilled workforce and progressive vision for green manufacturing empowers rapid and sustainable customer growth. The launch also brings new and exciting job opportunities with access to a range of rewarding employer benefits.

Cable Management Warehouse (CMW) has appointed Daniel Kidman as its new head of sales.

Panchaea has added two new team members – Nick Sonigra as non-executive director and Ben Baldieri as technical sales executive.

MLL Telecom has appointed Paul Tsang as business development manager for health. Joining from Redcentric, where he was head of communications solutions, Tsang will have sales and key account management responsibility for MLL's portfolio of health sector clients

Telehouse has formed a strategic partnership with Brothers Pictures Company to host NVIDIA GeForce NOW, marking the first cloud gaming service of its kind in Thailand.

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Green UPS

DARA TECH

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Our innovative DARA design delivers unparalleled scalability, eliminates single points of failure, and provides a fault-tolerant architecture. From compact 10 kW modules to robust 62.5 kW options, the UPS meets a range of power requirements with the ability to scale up to an impressive 3.75 MW.

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Logicalis has published its Global CIO Report 2024. To request a copy of The Future Face of Tech Leadership **CLICK HERE.**

Cyber Security In Critical National Infrastructure Organisations 2024 is a report by **Bridewell.** **CLICK HERE** to download a copy.

The CEO Digital Divide - Are You Accelerating Enterprise Value Or Slowing It Down? is a report from **AND Digital.** **CLICK HERE** to download a copy.

Navigating Liquid Cooling Architectures For Data Centers With AI Workloads is a white paper from **Schneider Electric.**
CLICK HERE to download a copy.

CBRE's Global Data Center Trend Report 2024 analyses key variables such as total inventory, vacancy rates, net absorption, pricing and rental rates, and availability in established and emerging markets across North America, Europe, Asia Pacific and Latin America.
CLICK HERE to download a copy.

The 2024 **Thales** Cloud Security Study offers the company's annual assessment on the latest cloud security threats, trends and emerging risks based on a survey of nearly 3,000 IT and security professionals across 18 countries in 37 industries.
CLICK HERE to download a copy.

Node4's Mid-Market It Priorities Report 2024 shines a light on shifting IT priorities and budgets, and captures IT decision maker sentiment.
To request a copy **CLICK HERE.**

Making a world of diff

John Kreyling is a renowned figure in the critical power distribution and protection industry, with a successful track record in delivering solutions that keep data centres running smoothly. Rob Shepherd spoke to him about his life and career, and uncovers the secret of his success

RS: Tell us a bit about yourself – who are you and what do you do?

JK: I have worked in the power distribution industry for more than two decades and joined Centiel at the start of 2024. My role is to support the growth of the business and I'm focused on the data centre part of the industry, helping organisations protect their critical power with our range of uninterruptible power supplies (UPS). I also work with both our sales and operations departments, building a platform to keep expanding.

I live in Benfleet in Essex and I'm a family guy and a glorified taxi driver to three girls. In our spare time, my wife and I enjoy walking, being outdoors and try to fit in city breaks when we can. I also love a good round of golf and watching the football.

RS: How and why did you decide to embark on a career in the power distribution and protection sector?

JK: At school and college my aim was to get into a sports science role – I never thought of becoming an engineer! Then reality kicked in and I needed to get a job. My uncle worked in the industry and helped me secure an apprenticeship with a local electrical contractor in Essex. It snowballed from there. I fell for the industry and it's been a source of endless fascination ever since.

RS: What excites you about the area you work in at present?

JK: As an engineer I like working with technology that satisfies a need or solves a problem. From a business point of view, I'm interested in making Centiel a household name in the industry. The market is growing and always moving forwards. Although new tech such as artificial intelligence (AI) can present challenges, the speed of development is exciting and it means there are many opportunities for growth.

Helping data centres save energy is my passion. Centiel's StratusPower, for example, effectively eliminates system downtime, while class leading 97.6 per cent on-line efficiency minimises running costs. Further, its 30-year design life means

ference

components need to be replaced less often, offering the potential to make a real impact on any data centre's sustainability goals.

RS: Are data centre owners and operators doing enough to deal with the energy demands placed on them by AI?

JK: Yes and no. Data centres are power and cooling hungry, requiring huge amounts of energy to run day-to-day operations. Furthermore, The International Energy Agency (IEA), in its Energy 24 report, found that electricity consumption from data centres could double within the next two years.

The only way to deal with these energy demands is for data centres to start to find ways to generate their own power, rather than relying on the grid, which is already struggling. This means being more proactive about harnessing renewable sources of energy.

Data centres have a bit of a reputation for using so much energy but they are essential. Without data centres, other technology wouldn't move forwards. The good news is that they are taking steps to look at harnessing energy from renewable sources and should be incentivised to do so. Reported recently in a strategy to decarbonise operations at its Dublin data centres, Keppel DC REIT has signed a 10-year agreement with a Greencoat Renewables to supply 81 per cent of the current power needed over the 10 years of the deal. Others need to follow suit.

RS: Is it really possible to have a sustainable digital infrastructure?

JK: That's a big question! As a manufacturer we must maintain the ambition of a sustainable digital infrastructure. It's not just about a product's energy efficiency but we all need to look at circular manufacturing – how we source, transport and manufacture products with extended lives, which last longer and can be recycled at end of life.

> 'If I could change one thing about the industry, it would be to make commercial contracts more inclusive to smaller and more entrepreneurial businesses. These sorts of organisations are often more agile and responsive.'

We have also looked at the United Nation's sustainability goals and identified several that are relevant to our manufacturing processes. We use these to guide our product development and put positive pressure on our suppliers to do the same. However, not all organisations think along these lines.

More could be made of both legislation and incentives to encourage a more sustainable approach industry wide. These days we are starting to see company bosses incentivised with sustainability bonuses and these will make a difference. In the end, money talks and legislation and incentives need to be leveraged more to inspire the progress towards the more sustainable future we desperately need.

RS: Is there enough knowledge and appreciation of the operational benefits

‘The data centre market will continue to grow rapidly – AI and blockchain technologies will fuel this fire. My concern is that quality suffers when there is increased demand. Data centres will want cheaper equipment and want it faster, and this will result in more competition within the UPS industry.’

of lithium-ion phosphate (LiFePO4) batteries? How can their use make a data centre more sustainable?

JK: Lithium-ion batteries in phones and those originally used in cars gained a bad reputation for catching fire. However, LiFePO4 batteries have a different chemical make-up, which eliminates thermal runaway. They also have many advantages over traditional valve regulated lead acid (VRLA) batteries. For example, they have a long design life, are smaller and don’t need the same cooling. They also have an increased cycling ability, so can be used to store and discharge energy, opening up applications to potentially support grid energy. This means they tick many sustainability boxes.

We are seeing take-up and this is likely to be accelerated when some of the LiFePO4 batteries that have already been installed successfully reach end of life and are recycled. These case studies will help prove the value of LiFePO4 batteries in real-life situations.

RS: What is the most common question you’re asked by your customers?

JK: Most customer questions are around price and lead times. When these are answered the conversation usually turns to reliability and the features and benefits of a UPS.

The key function of any UPS is to prevent power loss, so they want to know about that. Customers then ask what else can the UPS do? We might be talking about feeding back electricity to the grid or harnessing renewable energy.

RS: It's that crystal ball moment – how do you see the world of UPS and power protection in data centres developing over the next few years and what would you like to see happen?

JK: The data centre market will continue to grow rapidly – AI and blockchain technologies will fuel this fire. My concern is that quality suffers when there is increased demand. Data centres will want cheaper equipment and want it faster, and this will result in more competition within the UPS industry.

But a cost driven market with cheap, unreliable components will be detrimental to critical power protection, so buyers must become more educated and understand the implications and consequences of a lower capital expenditure purchase. We always say you wouldn't use a cheap, low-quality parachute to jump from a plane. The same needs to be true for critical power protection.

Ultimately, I would like to see UPS become more than critical power protection. The process has already started for battery storage, which can potentially be leveraged to support the grid and for getting solar integration to work. Much of this is theoretical at the moment, so we need to be able to move discussions forward to come up with practical solutions. Can we work with solar and battery manufacturers to create and deliver complete practical solutions for data centres? Only solutions which can be adopted easily will be taken forwards.

RS: If you could change one thing about the industry that you work in, what would it be?

JK: I like the industry – it's not just about products but about people too. I'm proud to say we have some important clients, which are integral to the support infrastructure of the nation. It is hugely satisfying to know that we deliver what they need and, in some way, contribute to keeping the country running smoothly on a daily basis!

If I could change one thing about the industry, it would be to make commercial contracts more inclusive to smaller and more entrepreneurial businesses. These sorts of organisations are often more agile and responsive. They are also more innovative, coming up with better solutions to challenges.

Currently, commercial contracts are not easily accessed by smaller firms who don't adhere to all the necessary criteria, yet they could help make real change. In this way, I believe having more inclusive commercial contracts could promote positive innovation – particularly in relation to sustainability.

RS: What's the best piece of advice you've been given and how has it helped you during your career?

JK: The best advice I've ever been given is to listen, listen and listen again. It's not all about what you do and your product but more about understanding the needs and ambitions of the client in order to help them.

One of my favourite quotes is from Richard Branson, who said, 'If you get into business solely to make money, you won't. If you try to make a real difference, you'll find success.' I am focused on supporting customers and helping them achieve their goals, whether that is reducing total cost of ownership or reducing energy use and becoming more sustainable, while protecting critical power in the most reliable way. Each customer is different and we need to understand what is driving them to be able to advise about the best solution for their individual needs. ■

Kingsland Drinks increases productivity with new Allied Telesis wireless network

Kingsland Drinks has significantly increased productivity and is meeting its efficiency targets thanks to a new wireless network providing comprehensive, always-on, connectivity over its 18-acre site. Following a site survey to map and understand the environment's physical characteristics, the solution was designed and supplied by Allied Telesis and its channel partner, Holker IT.

Kingsland Drinks has a high reliance on its IT infrastructure, and the ability to remotely monitor, manage and troubleshoot the network is vital. Based on Allied Telesis' Channel Blanket single channel wireless architecture, the new network solved the problem of blackspots and unreliable coverage in Kingsland Drinks' existing Wi-Fi network.

Deployed within two months, the new wireless network comprises AWC Channel Blanket licensing for hybrid wireless architecture, Allied Telesis TQ5403 wireless access points for indoor areas and Allied Telesis TQ5403e wireless access points for outdoor areas and areas requiring external, directional antennas. The new Allied Telesis network provides Kingsland Drinks with significantly improved coverage across the site, with no blackspots being reported by users and monitoring software showing good coverage in all required areas.

IOC deploys Alibaba Cloud's Energy Expert to optimise power consumption at Paris 2024 across all 35 venues

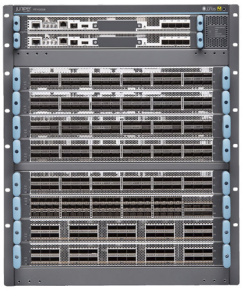
The International Olympic Committee (IOC) has deployed Alibaba Cloud's Energy Expert to help measure and analyse electricity consumption at the competition venues of the Olympic Games Paris 2024. By migrating the intelligence related to the power consumption and demand of the competition venues to the cloud-based platform for the first time, the solution enables more accurate analysis and better-informed power consumption planning for future Olympic Games.

Alibaba Cloud
Worldwide Cloud Services Partner

Energy Expert has been applied to all 35 competition venues during Paris 2024. With this solution, the IOC can consolidate all energy related data during the Olympics and Paralympics – such as electricity consumption, power demand contingency, venue capacity, competition related information and on-site weather conditions – into one easy to understand dashboard for a user-friendly experience.

Telxius upgrades its global network to 400Gb/s with a converged optical routing architecture from Juniper Networks

Telxius is scaling its core and edge network infrastructure to 400Gb/s with a converged optical routing architecture (CORA) from Juniper Networks. This enables network capacity expansion and delivery of enhanced connectivity to metro networks and data centre interconnects (DCI), providing connectivity to points of presence (PoPs) across Spain, the Americas and wider Europe.



Telxius' ecosystem combines fibre optic submarine cables and terrestrial backhauls, almost 100 PoPs in 17 countries, plus 27 data centres. It will migrate some of its key architecture to Juniper's CORA and PTX Series packet transport routers to deliver a network that offers power and space savings, superior performance and automated operations. This will free-up a substantial amount of reserved bandwidth and allow for flexible extension to 400Gb/s capacity. It will also create enhanced connectivity for Telxius' customers and create a more sustainable architecture by optimising network scalability and bandwidth efficiency.

The solution leverages leading edge technology with the use of an IP over dense wavelength division multiplexing (IPoDWDM) solution. This maximises routing platform capacity, scales-up link bandwidth, and will reach more network locations and customers, whilst removing the need to manage and maintain external DWDM equipment.

PROJECTS & CONTRACTS IN BRIEF

Verne has deployed a new high-performance computing (HPC) cluster in Iceland for ENGYS in collaboration with OCF. With ENGYS' on-premise cluster with OCF in the UK reaching end of life, the company realised it had an opportunity to move the compute to a more sustainable and efficient location, and Verne's Icelandic data centre was the optimal choice.

Node4 has signed a deal with Virgin Media Business Wholesale to upgrade its core network and deliver tenfold bandwidth increase.

Gloucester Rugby has modernised its digital infrastructure under the guidance of Emerge Digital. It includes the installation of a new, high-tech, highly resilient Cisco Meraki network that gives the club opportunities for the expansion of its IP requirements, scaling in line with its technology needs, as well as new security solutions – all of which will improve the club's IT resiliency and capability.

The Milano Cortina 2026 Foundation and Juniper Networks have signed a partnership agreement for Milano Cortina 2026 Olympic and Paralympic Winter Games. The collaboration aims to optimise network systems and protect data and virtual information for the major sporting event.

All things being equal

Kelley Mullick of Iceotope examines how liquid cooling is helping to balance the power and sustainability demands of artificial intelligence (AI)

The exponential growth of AI is changing the game for digital infrastructure and revolutionising how we interact with technology. From personalised recommendations on streaming platforms to autonomous vehicles navigating our roads, AI is seemingly everywhere, yet still in the early stages of its development.

POWER PACKED

AI's increasingly complex algorithms and vast datasets demand immense computational power, posing significant challenges for data centre operators striving to balance efficiency, sustainability and total cost of ownership (TCO). As AI workloads proliferate, data centre facilities evolve from mere storage hubs to interactive powerhouses.

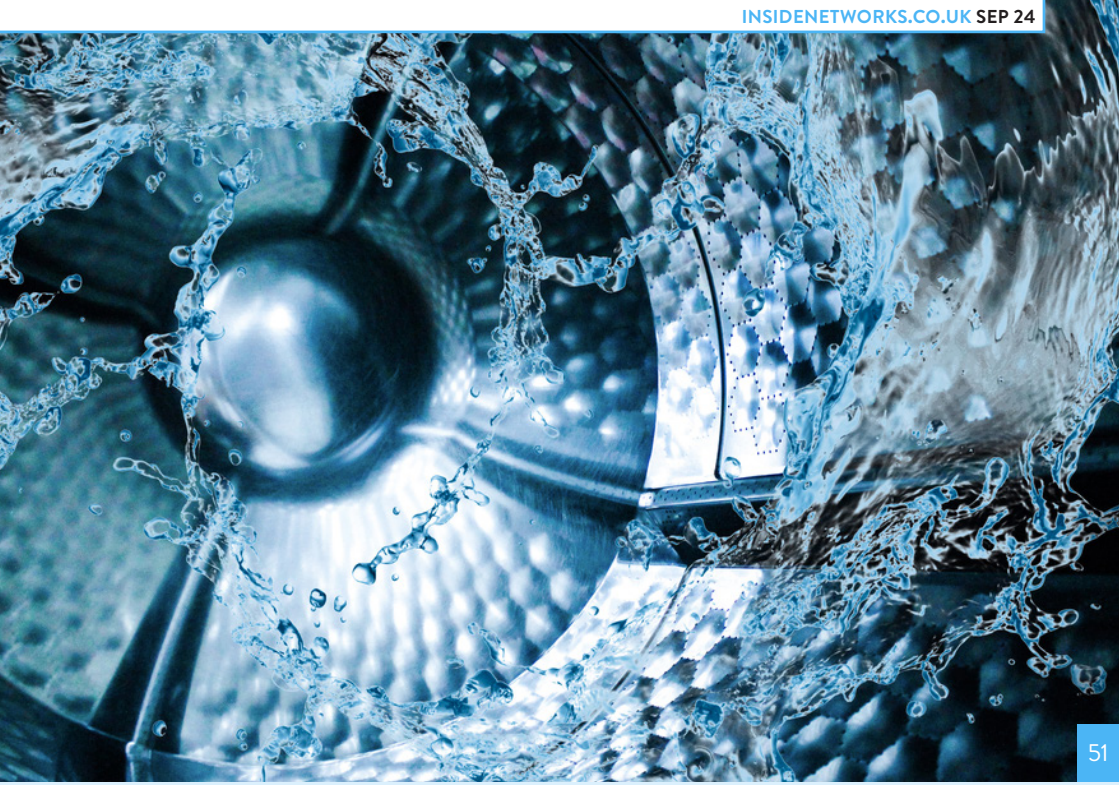
The surge in AI applications corresponds to a substantial increase in power demands, resulting in significant heat generation. Effectively managing this heat becomes a pressing concern for data centres, considering that cooling infrastructure currently consumes approximately 40 per cent of their energy usage. The International Energy Agency (IEA) predicts that global electricity demand, driven by AI, will double by 2026, exacerbating carbon emissions and sustainability challenges.

LIQUID ASSET

As AI compute demands grow, the environmental impact of AI becomes more pronounced. Liquid cooling plays a pivotal role in enabling AI to become more sustainable by addressing the significant energy consumption and thermal management challenges inherent in AI infrastructure. As AI workloads become increasingly demanding, dissipating the heat generated by high-performance computing components becomes a more critical issue.

Traditional air cooling methods are proving inadequate for the next generation of central processing units (CPUs) and graphics processing units (GPUs), many of which will require thermal design power (TDP) of 1000W sooner rather than later. At Nvidia GTC 2024, the company made headlines with the announcement of its 1200W Blackwell GPU by calling it 'a new class of AI superchip'. The solution is designed to build and run real-time generative AI on trillion parameter large language models.

Liquid cooling is emerging as a vital technology for AI workloads, offering superior performance, energy efficiency and hardware reliability. It offers a more efficient means of dissipating heat compared to air cooling methods. By circulating a coolant fluid directly over the hottest components, heat is rapidly transferred away, maintaining optimal operating temperatures for AI systems. As chips continue to get hotter, data centre



operators need to know they are future proofing their infrastructure investments. Choosing technologies that can meet the demands of processor and chip roadmaps and future server generations will be key.

CRITERIA FOR COOLING

As data centres continue their transition to liquid cooling, there are three critical criteria to consider – sustainability, serviceability and scalability.

• Sustainability

The escalating energy usage driven by the surge in AI workloads, coupled with rising power costs and impending government regulations underscores the urgency to reduce data centre energy consumption. Sustainability is now a pivotal criterion for vendor selection, reflecting the shift in perception where it's no longer seen as merely a cost but as an integral aspect of business strategy.

• Serviceability

Whether within the heart of a data centre or at the remote edges of networks, the clamour for simpler, cost-effective servicing of equipment reverberates. A technician capable of seamlessly swapping a module within the confines of a data centre campus should easily be able to do the same at a remote location.

• Scalability

The role of data centres is rapidly evolving thanks to AI applications that propel vast data streams to the edge of networks. The traditional data centre is no longer the centre of our data, so workloads must scale from the cloud to the edge. Repackaging conventional IT solutions falls short in addressing the demands of harsh IT landscapes and the sustainability demands

'Understanding the advantages of liquid cooling technologies, especially in the context of rising IT equipment demands and evolving sustainability requirements, is crucial for making informed decisions about the future.'

to reduce power consumption. Purpose built solutions are needed to address these concerns.

COMPARING TECHNOLOGIES

Different liquid cooling technologies offer varying benefits. Direct-to-chip cooling, also known as direct liquid cooling or cold plate technology, excels at delivering peak performance at the chip level but still relies on auxiliary air cooling, limiting its long-term sustainability.

Tank immersion cooling provides a more sustainable alternative by potentially eliminating the need for fans in data centres and enabling the recapture and reuse of nearly 100 per cent of the heat. However, its implementation often requires new facility designs and structural adjustments, posing challenges in existing brownfield data centre spaces. It also has serviceability issues that make maintenance and data centre operations challenging.

Among today's cooling technologies, precision liquid cooling is a third alternative that stands out as the simplest and most efficient option available. Combining the benefits of direct-to-chip and tank immersion, precision liquid cooling delivers a small amount of dielectric coolant, precisely targeting the removal of heat from the server's hottest components as well as the entire system within the chassis. This ensures maximum efficiency and reliability, removing nearly 100 per cent

of the heat generated across the entire IT stack, while reducing energy use by up to 40 per cent and water consumption by up to 100 per cent.

Beyond environmental and efficiency gains, precision liquid cooling also reduces stress on chassis components, cutting component failures by 30 per cent and extending server lifecycles. The ability to hot-swap servers both within data centres and remote locations streamlines service calls, reducing risks associated with service operations.

FUTURE DAYS

AI is fundamentally transforming digital infrastructure, driving unprecedented demand for compute power and posing significant challenges for data centre operators. Understanding the advantages of liquid cooling technologies, especially in the context of rising IT equipment demands and evolving sustainability requirements, is crucial for making informed decisions about the future. By embracing liquid cooling solutions like precision liquid cooling, organisations can enhance operational efficiency, reduce energy consumption and align with emerging sustainability standards. Data centres will be able to effectively manage the escalating thermal demands of AI workloads while reducing their environmental impact and operational costs. ■

KELLEY MULLICK

Kelley Mullick serves as the vice president of technology advancement and alliances at Iceotope. As a systems engineer, Mullick is known for her technical and business acumen for value-added solutions. She previously worked in product management and strategy for the Datacenter and AI Group at Intel Corporation, where she developed Intel's first immersion cooling warranty announced at Open Compute Project (OCP) 2022.

It's time to raise the bar

As the data centre sector stands at a crossroads, Harrison Barrett and Tony Cheales of Vantage Data Centers explain the need to drive forward and prioritise sustainable cooling solutions

Until microchip technology can emulate sun-basking lizards, effortlessly self-regulating temperature, energy hungry mechanical cooling systems in data centres are here to stay. As demand for cloud services and artificial intelligence (AI) grows, cooling technologies will inevitably evolve, incorporating a complex array of air, liquid and immersion cooling systems to handle increasingly dense IT loads.

RULES AND REGULATION

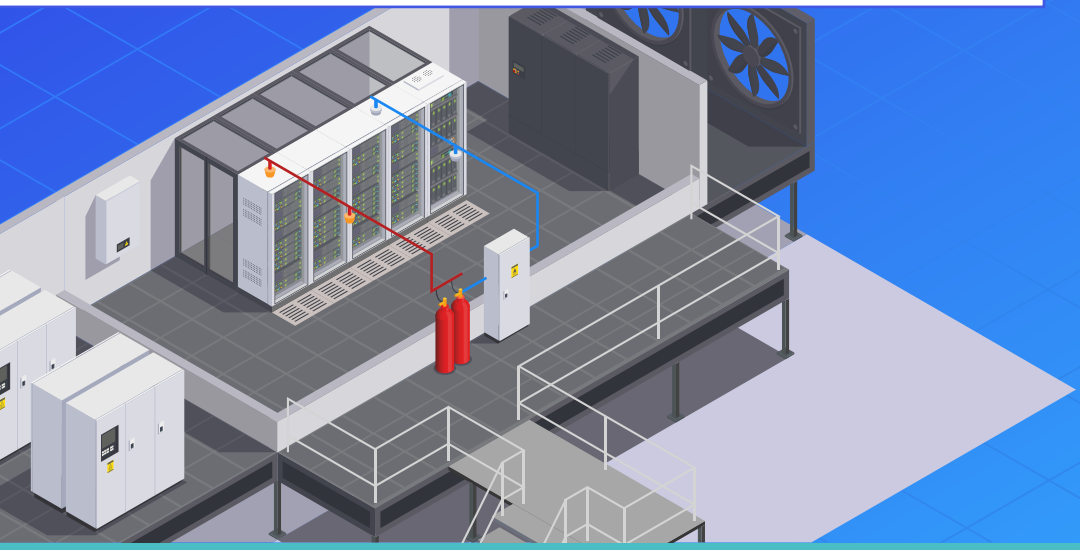
It is important to focus on the drivers, challenges and opportunities for sustainable cooling solutions in data centres including the regulatory landscape, counterproductive key performance indicators (KPIs), contractual risk aversion and the wasted waste heat conundrum. It is time to proactively collaborate and incentivise through life and whole system thinking, rather than passively reacting to well-intended but ultimately crude regulatory demands.

Regulation alone is not a complete solution to driving sustainable design principles. While efforts to elevate sustainability and energy efficiency initiatives from 'should' to 'must' are welcomed, overreliance on regulation can lead to unintended consequences and misguided attempts to manipulate requirements.

Currently, levels of sustainable design ambition and implementation vary significantly across markets, driven predominantly by local regulations and permitting demands, and less by technology companies' or investors' requirements, business objectives or cost-benefit analyses. Standards such as ISO 14001 and ISO 50001 offer useful frameworks for developing energy and environmental management systems, along with sustainable building certification schemes such as BREEAM and LEED, but these are voluntary and often costly to implement.

BRIDGING THE GAP

Emerging legislation in Europe, such as the Energy Efficiency Directive, the German Energy Efficiency Act (Energieeffizienzgesetz) and EU Taxonomy, is promoting a holistic approach to energy efficiency through ambitious Power Usage Effectiveness (PUE) targets, waste heat reuse, certified management systems and a commitment to procure renewable energy. Transparent reporting of sustainability metrics (aligned with EN 50600) drives accountability and continuous improvement, while EU Taxonomy alignment will compel use of



the European Code of Conduct on Data Centre Energy Efficiency and support the use of refrigerants with lower Global Warming Potential (GWP).

Associated national legislation will give these directives some teeth in order to drive action and accountability. Well-designed regulations can encourage investment in the research and development of innovative, environmentally sustainable solutions and provide the industry with a viable transition pathway to introduce greener alternatives, proving that sustainable development can provide 'win-win' scenarios. However, the general favouring of economic over environmental outcomes means legislation is not fully effective and often falls short of fulfilling sustainability goals.

UNINTENDED CONSEQUENCES

Overly focusing on PUE – the ratio of total energy consumed by a data centre to the energy used by the IT equipment it hosts – can unexpectedly drive inefficiencies and commercial pressures between landlord operators and tenants. Low IT loads (typically less than 20 per cent of capacity by data hall) will inevitably result in high PUE, as mechanical cooling systems cannot operate efficiently, and energy 'overheads' such as lighting and office heat loads skew the ratio.

To lower the risk of non-compliance, data centre operators could revert to water-based adiabatic or evaporative cooling systems to lower PUE low load IT thresholds. However, these systems put pressure on drinking water networks, are more expensive, require additional maintenance and increase through-life carbon emissions.

Another example is an aversion to electric vehicle (EV) charging installations at data centres, as it would become an energy overhead that would negatively impact the PUE ratio. Moreover, when IT energy procurement costs are passed from landlord operators to tenants, there is limited financial incentive for operators to invest in innovative building energy performance measures or on-site renewable supply and storage solutions.

BREAKING BARRIERS

Risk aversion is a significant barrier to adopting the most efficient cooling solutions and control strategies. Technology

'The path to efficient and sustainable cooling systems in data centres is challenging but viable. Through regulatory compliance, improved KPIs and contracts, and collaborative waste heat solutions, we can significantly minimise our environmental impact.'

company tenants typically mandate strict operating parameters with hefty financial penalties for non-compliance. Understandably, data centre designers and operators default to tried-and-tested technologies and apply safety margins to minimise the risk of a service level agreement (SLA) breach.

Although we could safely operate white spaces at higher temperatures, mandated average and peak operating temperatures remain relatively low. Even modest increases in average and peak chilled water and supply air temperatures would better enable AI workloads with liquid cooling, enhance waste heat reuse options and optimise cooling system performance.

The pursuit of 99.999 per cent availability inevitably comes at a cost in both energy and embodied carbon. Do all cloud services and AI applications require this high level of uptime? SLAs could include sustainability metrics alongside traditional performance indicators to incentivise the adoption of greener cooling systems, building designs and more dynamic control strategies, as well as managing the operating risk of IT uptime.

WASTED WASTE HEAT

Waste heat recovery from data centres is technically simple to facilitate and offers economic and environmental benefits. However, it requires a local heat network and 'off-taker' to use the heat, typically enabled by a district heating network driven by local authorities.

Incentives for data centre operators to cooperate in developing adjacent infrastructure, such as industrial, residential or leisure off-takers, are currently lacking. Without greater whole system thinking, modern data centres will be built to accommodate expensive heat exchangers and dedicated connection points that are never used. Early strategic collaboration with regional and local planning authorities is required to develop mutually supporting developments, with the local authority facilitating coordination of heat recovery across sectors and off-takers.

To drive innovation and bold solutions, the conversation needs to move beyond district residential heating networks towards more innovative industrial (breweries, food production or geothermal power generation) or leisure infrastructure (swimming pools and water parks). Large campus scale data centre developments with central power and cooling plants could strengthen the business and economic case for collaboratively developing infrastructure that can effectively use large amounts of waste heat.

CALL TO ACTION

The World Economic Forum cites 'failure to mitigate climate change' as the greatest long-term global threat, and the Paris Agreement's legally binding target of net zero greenhouse gas emissions by 2050 is looming. Addressing the sustainable

cooling dilemma requires a visionary approach through design, innovation, policy and financial drivers.

In addition to ambitious policymaking and regulation, technology companies and data centre investors are invited to be clearer and more demanding in their sustainability requirements. There must be a willingness to collaborate and incentivise difficult 'spend to save' decisions to minimise through life costs and carbon emissions, especially where energy procurement costs and associated carbon emission accountability are passed on to the tenant.

Decarbonisation efforts must be prioritised, with collaboration between policymakers, end users, designers, contractors, local authorities and equipment suppliers. The tools already exist – we just need to commit to using them more extensively and holistically. Business cases and decision making around sustainability will become simpler if we can monetise and compare through life energy and carbon emission costs and savings, including use and disposal.

UNITED FRONT

The growing demand for digital services necessitates an increase in data centre capacity, but this growth must be managed sustainably. By uniting efforts, the data centre sector can lead the way in energy efficiency and sustainability, setting an example for other industries to follow. The path to efficient and sustainable cooling systems in data centres is challenging but viable. Through regulatory compliance, improved KPIs and contracts, and collaborative waste heat solutions, we can significantly minimise our environmental impact. ■

HARRISON BARRETT
Harrison Barrett is sustainability engineering manager EMEA at Vantage Data Centers, having joined the company in 2023. Barrett has held a number of environmental management roles over the past nine years including at Kier Group, EDF Energy and Horizon Nuclear Power.

TONY CHEALES
Tony Cheales is director for the design program office EMEA at Vantage Data Centers. He has extensive experience of delivering mission critical infrastructure projects and joined Vantage's design team in 2024. Cheales is based in London with projects across Europe and South Africa.

AEM Precision Cable Test

Through a simple test adaptor add-on, AEM Precision Cable Test's TestPro and Network Service Assistant now feature in-line network testing capability, providing a real world evaluation of link performance with connected devices in use. The test adaptor allows users to connect in-line between the switch and the end device, such as a power over Ethernet (PoE) camera, and test while the end device is in use.

The testing provides details on connected speed up to 1Gb/s and signal to noise ratio (SNR) on both sides of the connection, as well as the power draw of the connected PoE device. The test can be run in real time or left to run. Test data can be retrieved using TestDataPro test results management software. Test parameters include:

- Negotiated connection speed
- Tx speed during activity
- PoE voltage
- PoE current
- PoE power
- SNR

CLICK HERE to schedule a demo or **CLICK HERE** to view the press announcement.

www.AEM-Test.com

Schneider Electric

Schneider Electric has launched its Schneider Electric Training programme in the UK and Ireland (UK&I). Schneider Electric's vision is to create a best-in-class approach to training, unifying specialist academies, courses and digital campuses into a holistic offering.

The move is in response to the chronic skills gap in engineering and the vital role that training plays in addressing the growing complexities associated with digital transformation. The extensive programme covers everything from artificial intelligence and the automation of machinery and equipment to innovations in power and energy management and safety standards and regulations.

Schneider Electric Training will provide an array of training options and resources, covering Schneider Electric solutions, industry focused courses and professional accreditations. It will be delivered via several specialist academies for in-person courses and a digital campus offering on-demand courses. Two academies are already up and running, with three more due to be launched by the end of the year.

To find out more **CLICK HERE.**

www.se.com

R&M

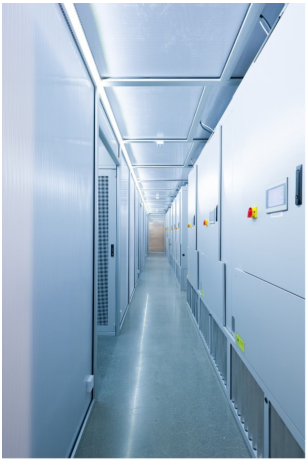
R&M's CONEXIO range offers fibre to the antenna (FTTA) and power to the antenna (PTTA) solutions for the 5G era. The integrated product family brings site and operator specific infrastructure system solutions for 5G and mobile communications within reach. **CLICK HERE** to find out more about CONEXIO.

R&M's HEC harsh environment connector is developed for fibre optic connection of 5G and mobile communication antennas in the harshest outdoor applications. The HEC-BR and HEC-QR withstand extreme temperatures, vibrations, salt spray, dirt and moisture – providing lasting connectivity anywhere. **CLICK HERE** to find out more about HEC.

Furthermore, the SYNO dome closure with innovative gel cold sealing and variable cable entries offers great freedom in accommodating specific site conditions and requirements quickly and cost effectively. **CLICK HERE** to find out more about SYNO.

www.rdm.com

EcoCooling



Incorporating free or adiabatic cooling into your data centre can cut cooling electricity usage by up to 90 per cent, significantly reducing total facility power consumption.

With demand for computing power increasing exponentially, fresh air cooling provides a cost-effective, green alternative to computer room air conditioning (CRAC) units, aligning with net zero strategies. Eliminating the need for refrigerant-based cooling in most European locations, fresh, filtered air is used to cool a data centre.

EcoCooling's established range of direct fresh air coolers and simple infrastructure solutions are installed in some of the world's most efficient data centres. Suitable for new build or retrofit installations, they can be easily configured to run alongside existing heating, ventilation and air conditioning (HVAC) systems to achieve desired environmental conditions.

Suitable for rapid deployment strategies, EcoCooling's solutions have proven reliability for high performance computing (HPC) equipment across Europe and the US.

CLICK HERE to speak to us about free cooling your data centre.

www.ecocooling.co.uk

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Glandular fever

Lee Frizzell of CMP Products explains why cable glands should be an important consideration for system designers, despite them neither emitting electromagnetic interference (EMI) or being susceptible to it

The electromagnetic compatibility (EMC) of equipment used in the design of electrical and electronic systems is of huge importance in any installation. Nowhere is that more the case than in data centres, where a power outage or equipment malfunction could be cataclysmic.

FIELD WORK

Also referred to as radio frequency interference (RFI) or noise, EMI is a disturbance in the magnetic field surrounding equipment that can affect electrical or electronic circuits in the vicinity. It's commonly generated in automation utilising drives, motors and transmitters, and the problems caused by it can include overvoltage, undervoltage or transients – all of which can lead to the degradation of the circuit.

In data centres, power sources tend to produce low-frequency EMI, which can damage hardware, corrupt data and even wipe out an entire hard drive. Cables near EMI sources, unless properly protected, are exposed to currents and can suffer a surge in voltage. It's the high-voltage current that then generates electrical noise, which interferes with data and voice applications that the cabling supports.

TRACKS OF MY TIERS

Because there are so many different types

‘In data centres, power sources tend to produce low-frequency EMI, which can damage hardware, corrupt data and even wipe out an entire hard drive. Cables near EMI sources, unless properly protected, are exposed to currents and can suffer a surge in voltage.’

of data centre, the Uptime Institute in the US developed the Tier Standard. This evaluates the quality and reliability of data centres and provides guidance on the level of EMI protection needed. Hewlett Packard outlines the tiers like this:

- Tier 1: Has a single path for power and cooling and few, if any, redundant and back-up components. It has an expected uptime of 99.671 per cent (28.8 hours of downtime annually).
- Tier 2: Has a single path for power and cooling and some redundant and back-up components. It has an expected uptime of 99.741 per cent (22 hours of downtime annually).
- Tier 3: Has multiple paths for power and cooling and systems in place to update and maintain it without taking it offline. It has an expected uptime of 99.982 per cent (1.6 hours of downtime annually).
- Tier 4: Built to be completely fault tolerant and has redundancy for every component. It has an expected uptime of 99.995 per cent (26.3 minutes of downtime annually).

Each tier contains the required components of all the tiers below it, with design rules coming into play for Tiers 3 and 4 to address potential threats to uptime of the systems.

PLAY IT SAFE

Shielding is proven as the best protection against EMI and is of greatest importance in higher-tier data centres. This is the practice of surrounding electronics and cables with conductive or magnetic materials, which protect against incoming or outgoing emissions of electromagnetic frequencies.

Legislative safety standards and directives have long been established to ensure that the environment, equipment and machinery are properly shielded, with

the key initiative being the European Union EMC Directive – a regulation to enforce limitations on all electrical and electronic equipment that may cause or be affected by EMI. Originally enacted in 1989 under Directive 89/336/EEC, the EMC Directive has witnessed significant development since it first came into force. It has been amended several times since then, the latest being in 2016, when the new EMC 2014/30/EU Directive became effective.

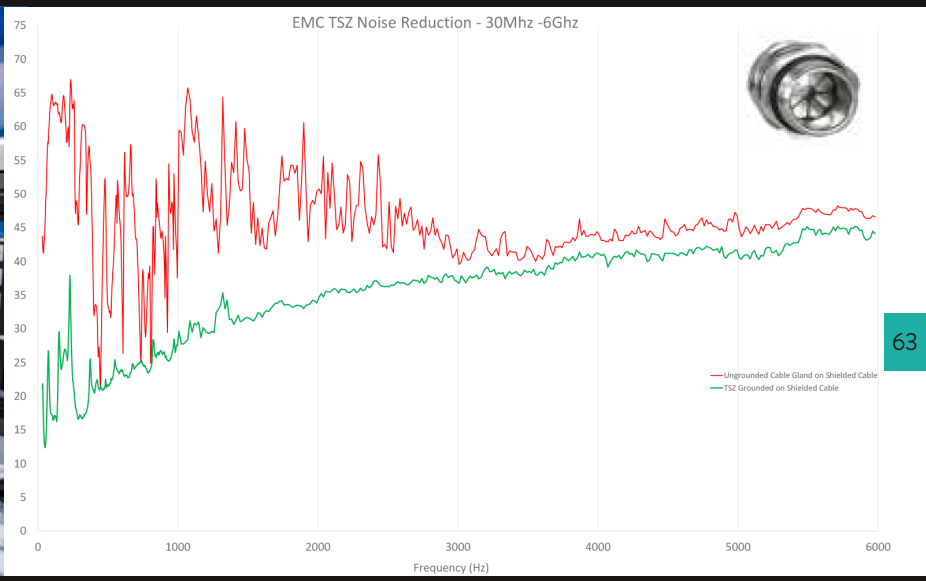
The EMC Directive requires that products must not generate unwanted electromagnetic pollution or interference and that products must be immune to a reasonable amount of noise pollution or interference. EMC testing is required to be carried out on any electrical or electronic product that may either cause electromagnetic radiation or be affected by it.

GROUND FLOOR

The EMC Directive means equipment manufacturers must make considerations early in the electrical and electronic design process to ensure equipment will pass EMC test requirements. Many design techniques are therefore adopted to limit EMI emissions at source or to protect susceptible equipment.

Circuits may be partitioned, segregating EMC critical and non-critical areas. A good grounding scheme may be implemented, preventing earth loops leading to unwanted signals being radiated. Shielded cables and enclosures are often utilised, providing barriers to unwanted radiated noise.

However, a significant oversight is often found at the point of cable entry into an electrical enclosure. By adding openings in enclosures, pathways are created to allow noise to breach the shielded enclosure. Unterminated or poorly terminated cable shields can allow noise to be carried into the enclosures, acting as antennas to radiate noise on to sensitive circuits.



PUT TO THE TEST

Grounding the cable shield effectively inside a cable gland at point of entry eliminates a potential noise pathway and reduces the risks of radiated emissions being carried into the enclosure. Cable glands, which employ a robust 360° circumferential termination of the cable screen, shield braid or armour (with a cone and clamping ring, or a dedicated continuity device) in their metallic body, contribute to the EMC of installations through reliable low impedance connections.

Statistics that are backed-up by several industry studies highlight the role they can play in EMC protection. One such independent study was commissioned by CMP Products in 2021 and carried out by a third-party, Eurofins E&E.

3m Class B radiated emission measurement tests were carried out, in accordance with EN 55032, to gauge the performance of cable glands terminated on to screened, braid shielded and armoured cables. The results proved categorically that using a reliable, 360° termination of the shield or metallic cable layer inside the cable gland improved noise attenuation throughout the frequency range.

ONE STEP AHEAD

When it comes to improving electrical safety, whether it be with the intention of protecting people, power supplies or data, it's imperative that every potential step is taken to ensure the systems are the most robust they possibly can be. As such, suitably proven cable glands need to be given proper consideration – and if this can be done within the remit of the EMC Directive then it would ensure they are. ■

LEE FRIZZELL

Lee Frizzell is technical director at CMP Products. He has extensive experience in engineering design and development through innovation, and is currently heavily involved with the complete spectrum of product specification through to high volume manufacture. He provides day-to-day support to production operations along with specialist technical support on product installation and conformance to worldwide explosive atmosphere/hazardous area standards and certification requirements.

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