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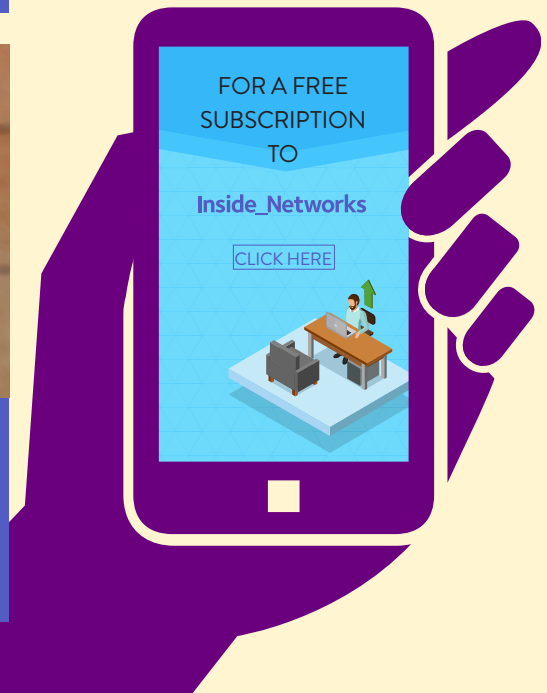
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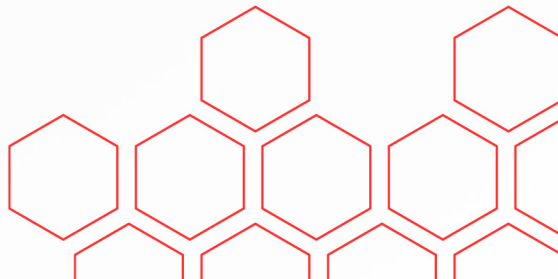


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Fast track

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AI and high performance computing are reshaping the infrastructure of modern data centres. As graphics processing unit (GPU) clusters scale to unprecedented sizes, this shift is driving the emergence of 1.6Tb/s networking systems.

In this environment, cabling and connectivity have become strategic components rather than background infrastructure. High speed optical fibre, advanced connectors and improved cable management systems are essential for maintaining signal integrity at these kinds of data rates. Poorly designed cabling can introduce latency, signal loss and power inefficiencies that undermine the performance benefits of next generation networking hardware.

As network performance is only as strong as the physical layer supporting it, in this month's Question Time we've asked a specially selected panel of industry experts to discuss why investing in scalable, high quality connectivity solutions will be critical to unlocking the full potential of 1.6Tb/s architectures. They also highlight what data centre operators should be doing to ensure readiness for higher speeds.

Power availability and reliability remain central concerns in the data centre industry, while improving efficiency and sustainability is critical to maintaining uptime and supporting future expansion. Ben Pritchard of AVK explains how smarter power infrastructure can help achieve net-zero targets, Matthew Baynes of Schneider Electric looks at how resilient UPS systems and intelligent power distribution architectures are emerging as enablers of growth, while Graham Hunt of Centiel tells us why preventative UPS maintenance is mission critical.

As digital transformation continues apace there is increasing need for compute power at the edge, with micro-modular data centres becoming increasingly popular. In this issue Chris Wellfair of Secure IT Environments (SITE) explains how to get the best from a fleet of micro data centres and Nash Maharaj of Vertiv examines the rise of micro-modular data centres and how they are empowering the edge computing revolution.

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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52 per cent of IT leaders cite rising power costs as top data centre concern

In a survey of 100 senior UK IT decision makers, Asanti found that 48 per cent of respondents think AI adoption will have a large influence on their IT infrastructure strategy over the next three years, ahead of regulatory change and hybrid or multi-cloud capabilities. They report average rack densities of 8kW per rack today, rising to 11kW within 12 months, as AI-heavy workloads and high density compute drive up power and cooling requirements.

Rising power costs are already the top concern regarding current data centre environments, cited by 52 per cent of respondents, ahead of maintaining uptime



(48 per cent). Over the next three years, rising energy costs (34 per cent) and sustainability commitments (33 per cent) sit alongside AI, resilience and regulatory change as core inputs to infrastructure strategy.

Stewart Laing, CEO at Asanti, said, 'AI has moved from pilot projects to production workloads and with it comes a step-change in rack density, power demand and cooling requirements. Organisations are realising they need the right mix of facilities, partners and architectures to deliver compute and storage requirements without compromising on resilience, sovereignty or cost control.'

University of Birmingham to host national computing centre

The University of Birmingham has secured £18mn of funding to create a national computing centre that will help accelerate research and innovation across the UK. The Baskerville National Compute Resource (NCR) will benefit researchers in every discipline – from climate science and healthcare to engineering, social sciences and the arts.

Funded by UK Research and Innovation (UKRI), the centre will harness advanced accelerator technology to process vast amounts of data at incredible speed, helping researchers achieve breakthroughs faster than ever before.

It will benefit projects like developing

new digital tools to help decarbonise industry, predicting weather patterns, analysing medical information, designing innovative technologies and exploring cultural trends.



Rachel O'Reilly, pro-vice-chancellor (research) at the University of Birmingham, said, 'This world class data processing facility places the University of Birmingham at the heart of the UK's computing

landscape. It will provide a sustainable, nationally accessible platform that will help drive research and discovery.'

Pure Data Centres and AVK deploy Europe's first data centre microgrid

Pure Data Centres and AVK have completed Europe's first, large scale, 110MW on-site microgrid, developed to support early phase site operational resilience. Located within Pure DC's Dublin campus, the on-site energy system provides the opportunity for dispatchable capacity to support data centre operations during initial development phases, prior to full integration with the national electricity system as grid connection capacity becomes available.

The campus is intended to operate as part of a hybrid energy configuration, combining grid supplied electricity with on-site infrastructure designed to enhance

flexibility, resilience and system stability. A first of its kind deployment in Europe, it showcases the ability to use AVK's microgrid technology for on-site power generation, and the transitional and complementary role it can play in supporting the delivery of strategically important digital infrastructure.

Ben Pritchard, CEO at AVK, said, 'We are delighted to have worked with Pure DC to deliver

this groundbreaking project. While several microgrids are already in operation in the US, until now there were none of these deployments in Europe.'



65 per cent of UK business leaders prioritise cybersecurity but internal threats demand attention

Research from Axians UK has highlighted a profound shift in enterprise risk priorities. While 56 per cent of respondents have access to network performance data, fewer than 40 per cent trust it to guide commercial decisions. This gap creates hidden risks when AI and machine learning tools make configuration changes without full visibility of downstream impacts.

Two-thirds of enterprises launched digital transformation programmes in the last five years, yet only one-third achieved 75



per cent of promised value. This suggests many initiatives were treated as solely IT projects rather than encompassing business transformations, leaving organisations with modernised components that don't work seamlessly together.

'The most successful organisations recognise that operational

resilience isn't just about defending against external threats,' said Chris Gilmour, chief technology officer at Axians UK. 'It's about ensuring your own technology stack doesn't become your biggest vulnerability.'

78 per cent of businesses now using AI but less than a third have seen financial benefits

While over three quarters of UK businesses are now using AI tools, the vast majority are yet to see any return on their AI investments, according to research from Studio Graphene.

The company commissioned Censuwide to survey 500 managers, directors and C-suite executives. It found that 78 per cent of those polled are using AI in some capacity – rising to 85 per cent for mid-sized organisations (100-249 employees), the highest of any group. A further 14 per cent are exploring their options or plan to implement AI in 2026, with eight per cent not using AI and having no plans to.



It also revealed that only 31 per cent of the businesses using AI have seen a positive return on investment. 18 per cent said their

AI projects have not delivered the benefits they expected, while 16 per cent said it was too early to tell.

Ritam Gandhi, director and founder of Studio Graphene, said, 'Many organisations

are at a critical point in their AI journey. Adoption has skyrocketed in the past year, particularly among mid-sized businesses, but our research clearly shows just how much progress is required for AI projects to be successful.'

Schneider Electric teams up with NVIDIA and AVEVA to develop validated blueprints for GW scale AI factories

Schneider Electric, in collaboration with NVIDIA and AVEVA, has announced key advancements in designing, simulating, building, operating and maintaining the next generation of AI data centre infrastructure during NVIDIA GTC in San Jose.

They include a new NVIDIA Vera Rubin reference design that validates power and cooling for the latest NVIDIA rack-scale architectures, integration of advanced digital twin capabilities within the NVIDIA Omniverse DSX Blueprint and ecosystem, and early testing of agentic AI for data centre alarm management services using NVIDIA Nemotron open models.

'As AI workloads scale, the margin for error in data centre design becomes incredibly small,' said Manish Kumar,

executive vice president Secure Power & Data Centers at Schneider Electric. 'It requires tightly integrated electrical, cooling and digital architectures that can support both unprecedented performance demands while maintaining peak energy efficiency. By combining advanced



software, digital twins and validated reference designs, operators can simulate and optimise infrastructure before a single rack is deployed.'

UK government under fire over multibillion AI drive built on 'phantom investments'

UK government's procurement process has come under fire after an investigation revealed that its flagship AI policy has been built on 'phantom investments' and rented data centres. A report by The Guardian newspaper revealed that the UK's AI strategy is in disarray with jobs unaccounted for, while a supercomputer site 12 miles north of London is still a scaffolding yard.

The investments have been touted as a cornerstone of the government's promise to use tech to turbocharge the economy. In one case, the newspaper discovered that there was no contract in place for a

£1.9bn (\$2.5bn) investment despite a press release declaring that one had been signed.

In another, it said that it was 'not playing an active role in auditing these commitments'.

The findings raise questions about a series of massive AI investments announced globally in the past year, many in high level press releases from governments and tech companies. However, Cecilia Rikap, a professor of economics at University

College London, said, 'These are phantom investments. Big tech companies artificially inflate data centres' job creation and economic impact to please governments, which are desperate to claim they are making the economy grow.'



NEWS IN BRIEF

PoweringAI has launched a new European data centre development platform focused on repurposing powered brownfield industrial sites into AI-ready data centres. Spun out of Xynteo and backed by Leon Capital, the venture brings together energy, infrastructure and industrial partnership expertise to fast-track data centre development on grid connected sites that would otherwise remain stranded.

Equinix and Canada Pension Plan Investment Board (CPP Investments) have announced their acquisition of atNorth for \$4.2bn. atNorth operates eight data centres across Denmark, Finland, Iceland, Norway and Sweden, with several additional sites under development. Its portfolio includes an active development pipeline of 800MW that will come online over the next five years, an additional 1GW of secured power and considerable future capacity.

UK organisations are leaving 27 per cent of promised transformation value unrealised, equivalent to £27mn lost for every £100mn invested, according to research from Sullivan & Stanley. It exposes a widening gap between leadership confidence and delivery capability, with 90 per cent of leaders confident in their strategy, yet only seven per cent consistently delivering the full value of their transformation business cases.



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Critical national infrastructure

Hi Rob

Between late 2024 and 2025, a wave of coordinated power disruptions in Eastern Europe and localised grid failures in South America made one thing clear – the era of hypothetical threats to critical national infrastructure is over. The real danger lies in unseen incursions, silently probing and mapping systems long before anyone notices.

Take the 2023 compromise of the Littleton Electric Light and Water Departments (LELWD). A Chinese state sponsored cyber group maintained access for months before detection. While seemingly small, this incident proved how attackers can map critical national infrastructure and identify leverage points for future operations, striking at the optimal moment.

We are operating in an increasingly unstable geopolitical landscape defined by ‘sub-threshold conflict’. In this grey zone, nation states engage in aggression that stops just short of traditional warfare, making cyberattacks an ideal tool. They are low cost, offer plausible deniability via proxies and can deliver outsized psychological and physical impact.

By targeting systems that provide heat, water and power, adversaries exert pressure by eroding public confidence. A substation is no longer just equipment – it is a high value target in global digital brinkmanship.

Vulnerability is not only a result of malice but also of complexity. Historically, operational technology (OT) systems controlling physical processes were air gapped. Today, IT/OT convergence connects legacy mechanical systems to



the internet. Many were never designed for modern threats, leaving decades old hardware with no encryption and flat networks where a single compromised laptop can provide lateral access to a control centre. OT environments are hard to patch, creating a ‘blast radius’ where localised breaches can escalate into regional crises.

Yet technical gaps are only part of the story and human and procedural weaknesses often dominate. Coordination and decisive action matter more than tools. Clear roles, practiced decision making and rehearsed emergency procedures can mean the difference between a contained

resilience is non-negotiable



incident and cascading failure.

Regulation is rising to address these risks, with governments enforcing risk based security frameworks, accelerated reporting and closer coordination with private operators. But compliance sets a floor, not a ceiling.

True security requires moving beyond checklists to a strategic

defence prioritising the highest stakes assets. Operators must design for ‘the worst day’, layering controls around control centres, high impact substations and remote access pathways. Breaches will happen – resilience comes from containment by design and rehearsed degraded operations.

Strategic resilience also considers critical dependencies across the supply chain and third-party providers. Planning for failure, not invincibility, is essential. Organisations must define emergency runmodes and ensure teams can operate manually if digital systems fail.

Critical national infrastructure is fundamentally about public safety. Cyber incidents are not just about downtime – they affect communities and staff in real time. True resilience integrates cybersecurity, engineering and process safety across an organisation. Even IT-side disruption can force OT shutdowns if operators cannot guarantee safe operation.

Resilience is not the absence of attacks. It is the ability to deliver essential services safely through disruption and to prove capability before a crisis hits. Through governance, containment by design and practiced emergency operations, operators can move from vulnerability to readiness. When the worst day comes, this readiness is what keeps the lights on.

Dennis Martin
Axians UK

Editor’s comment

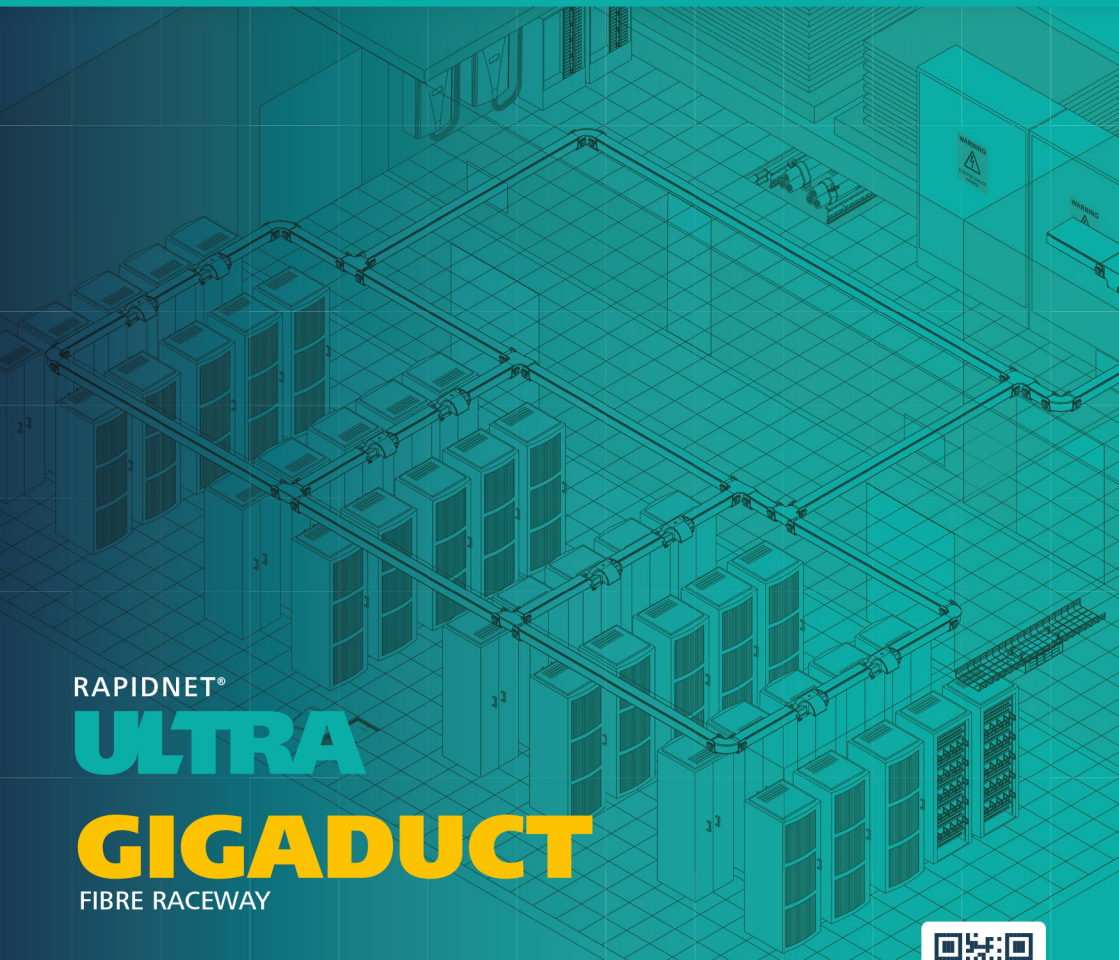
As numerous events have demonstrated, those with malicious intent believe that eroding trust in government and utilities can be more destabilising than physical destruction. As Dennis highlights when he says, ‘Planning for failure, not invincibility, is essential,’ resilience is not a defensive luxury, it is a national security imperative.

As well as traditional utilities such as water and power, data centres are now classed as critical national infrastructure too. As such, operators must focus on endurance and the capacity to absorb disruption, restore services quickly and maintain public trust under pressure. Stability will depend on proving that disruption does not translate into disorder.

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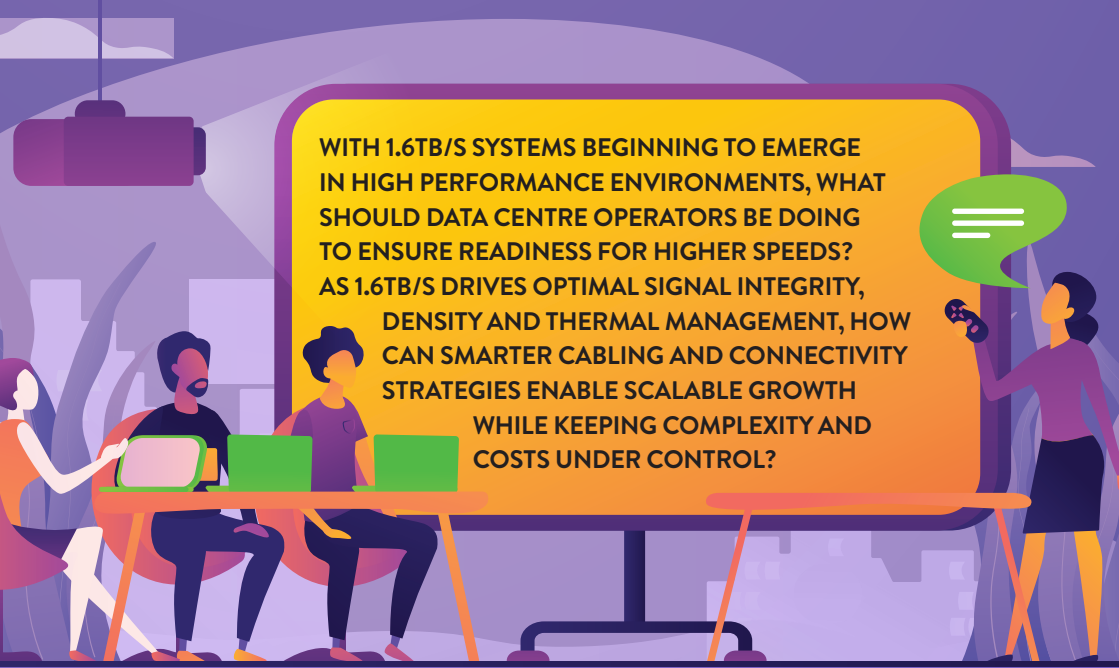
The emergence of 1.6Tb/s networking systems marks a major milestone in the evolution of high performance data centre infrastructure. [Inside_Networks](#) has assembled a panel of industry experts to examine the role cabling and connectivity play in this significant change

▶ Driven by AI and high performance computing, traditional 100Gb/s, 400Gb/s and even 800Gb/s interconnects are reaching their practical limits. As organisations deploy larger graphics processing unit (GPU) clusters, the need for ultra-high bandwidth, low latency and energy efficient connectivity has intensified.

As a result, 1.6Tb/s networking systems are starting to appear in data centres as demand for faster data movement continues to grow. A 1.6Tb/s connection allows far more data to move between servers, switches and storage devices

every second, which helps reduce delays, prevents network bottlenecks and improves overall system performance.

Cabling and connectivity play a vital role in enabling 1.6Tb/s data centre networks and, at these speeds, signal integrity, power efficiency and thermal performance become major challenges. Inside_Networks has brought together a panel of industry experts to explain the key cabling and connectivity strategies in these next generation data centre environments.

An illustration of a meeting. Three people are seated at a table with laptops, and one person is standing and pointing at a large screen. The screen displays text about 1.6Tb/s systems. The background is a stylized cityscape.

WITH 1.6TB/S SYSTEMS BEGINNING TO EMERGE IN HIGH PERFORMANCE ENVIRONMENTS, WHAT SHOULD DATA CENTRE OPERATORS BE DOING TO ENSURE READINESS FOR HIGHER SPEEDS? AS 1.6TB/S DRIVES OPTIMAL SIGNAL INTEGRITY, DENSITY AND THERMAL MANAGEMENT, HOW CAN SMARTER CABLING AND CONNECTIVITY STRATEGIES ENABLE SCALABLE GROWTH WHILE KEEPING COMPLEXITY AND COSTS UNDER CONTROL?

RYAN HARRIS

DIRECTOR OF SALES ENGINEERING AT SIEMON

Higher speed networking is evolving at a rapid pace. Large organisations are already looking at 1.6Tb/s to support throughput at the spine level, so there are no bottlenecks, as AI servers scale out at a blazing 800Gb/s per port.

InfiniBand is typically the first to deliver the fastest speeds and that is true with 1.6Tb/s. However, with the completion of IEEE 802.3dj in 2026, new 1.6Tb/s Ethernet products will emerge, expanding customer choice and enabling broader adoption over time. There is already discussion around speeds up to 3.2Tb/s and beyond, so time will tell if 1.6Tb/s is simply a stepping stone to the next generation.

It is difficult for most organisations to keep up at this pace while balancing performance, cost and on-premise compute utilisation. To ensure readiness for higher speeds, many data centre operators are starting their AI journey in the cloud, using neocloud environments to validate requirements and right-size infrastructure before making major investments. This enables scalable growth while keeping early complexity and costs under control.

As AI workload requirements level out, the focus shifts to bringing AI in-house. Higher speeds like 1.6Tb/s make it possible to deploy smaller footprints with higher density, but they also introduce challenges in signal integrity, power and cooling that many facilities are not ready to support today. In preparation, organisations are upgrading their front end network server

and storage connections now to avoid bottlenecks as back end AI fabrics scale.

Smarter cabling and connectivity strategies will be critical at these speeds. Operators need to design connectivity with modularity, scalability and future planning in mind, ensuring higher density infrastructure can be deployed without increasing operational complexity.

For large scale deployments, using structured cabling designs with high density optical fibre connectivity lays a foundation and supports consistent performance as speeds increase. Investing in back end network cabling infrastructure simplifies upgrades, reduces disruption and keep costs under control.

AI networks are not just GPU compute. Storage and front end network connections play a critical role in feeding data and deploying models efficiently. Upgrading systems using low power copper with scalable and modular footprints enables operators to deploy next generation technologies with the highest return on investment, ready to grow and support future AI needs.



'HIGHER SPEEDS LIKE 1.6TB/S MAKE IT POSSIBLE TO DEPLOY SMALLER FOOTPRINTS WITH HIGHER DENSITY, BUT THEY ALSO INTRODUCE CHALLENGES IN SIGNAL INTEGRITY, POWER AND COOLING THAT MANY FACILITIES ARE NOT READY TO SUPPORT TODAY.'

MICHAEL AKINLA

BUSINESS MANAGER NORTHERN EUROPE AT PANDUIT

As data centre architectures move toward 1.6Tb/s, the impact of physical layer behaviour and network topology efficiency increases. Achieving a 1.6Tb/s data rate requires serial speeds of 200Gb/s per lane, twice that of the previous transceiver generation. At these higher speeds, even small impairments in signal quality or design inefficiencies can cascade into measurable performance loss at scale.

Physical layer effects are amplified in AI clusters, where tail latency, not average latency, determines job completion time in distributed workloads. At typical in-rack or row scale distances, optical fibre propagation delay is negligible compared to forward error correction (FEC) and switch processing latency. These benefit from flattened topologies that minimise hop count as link speeds increase.

Modern optical interfaces rely on advanced modulation schemes that require FEC to achieve a negligible bit error ratio (BER). While this introduces additional processing latency, it is necessary to operate at these high speeds. Failure to meet BER compliance thresholds increases packet loss and, consequently, tail latency – or can result in complete link failure.

Compliant optical channels typically operate with substantial margin before approaching error thresholds. When loss budgets are respected, additional connection points, such as those required to implement a structured cabling

deployment, do not inherently degrade performance, provided insertion loss, return loss and connector cleanliness are tightly controlled. This margin is critical for sustaining reliability over time as components age and environmental conditions fluctuate.

AI clusters require several times more fibre connections than conventional data centres, increasing risks related to airflow restriction, bend violations and mechanical stress. Poor routing or unmanaged slack can permanently damage fibre cable, directly degrading signal integrity and reliability.

Structured cabling addresses these challenges by enabling orderly deployment, improving maintainability and supporting non-disruptive transceiver replacement in large AI data centres. From an operational perspective, deterministic infrastructure matters and will impact system performance.

Ultimately, readiness for 1.6Tb/s is achieved by engineering the physical infrastructure correctly. When topology, cabling architecture and optical performance are aligned, high speed systems can scale predictably while maintaining signal integrity, thermal efficiency and operational control.



'ULTIMATELY, READINESS FOR 1.6TB/S IS ACHIEVED BY ENGINEERING THE PHYSICAL INFRASTRUCTURE CORRECTLY.'

CARSTEN LUDWIG

MARKET MANAGER DATA CENTRES AT R&M

As 1.6Tb/s platforms appear in high performance computing and AI-heavy environments, data centre operators should treat 'readiness' as an end to end planning exercise. As such, they should start with the application and architecture rather than the transceiver.

The first step in the process is to understand the deployment context – are you upgrading a legacy estate, building an 'island' fabric for a single application or supporting mixed use cases in the same halls? Each scenario drives different choices in topology, migration sequencing and operational processes.

From a cabling perspective, higher speeds increasingly favour Base-8 optical fibre structures, so operators should standardise around Base-8 from the outset and adopt a modular, structured approach that allows capacity to be added in small increments without disruptive re-cabling. Where Base-12 exists today, ensure your solution supports a straightforward transition to Base-8, protecting investment while enabling the next bandwidth step.

Media selection matters. Inside the rack, short copper links can still make sense for certain north-south connections where latency is paramount and distances are



minimal. Across a row – between server racks, switching and storage – east-west traffic will typically benefit from modular fibre connectivity to deliver the density, reach and signal integrity that 1.6Tb/s demands.

Signal integrity at these rates also means managing the link budget with discipline. Therefore, it is highly advisable to minimise unnecessary interconnections, avoid excessive adaptor cascades and design pathways that reduce complexity while improving reliability.

If connectivity volumes grow faster than physical space, consider strategies that increase fibre efficiency. This can mean using multiple wavelengths, like dense wavelength division multiplexing (DWDM), to scale capacity without a linear increase in fibre count.

'FROM A CABLING PERSPECTIVE, HIGHER SPEEDS INCREASINGLY FAVOUR BASE-8 OPTICAL FIBRE STRUCTURES, SO OPERATORS SHOULD STANDARDISE AROUND BASE-8 FROM THE OUTSET AND ADOPT A MODULAR, STRUCTURED APPROACH THAT ALLOWS CAPACITY TO BE ADDED IN SMALL INCREMENTS WITHOUT DISRUPTIVE RE-CABLING.'

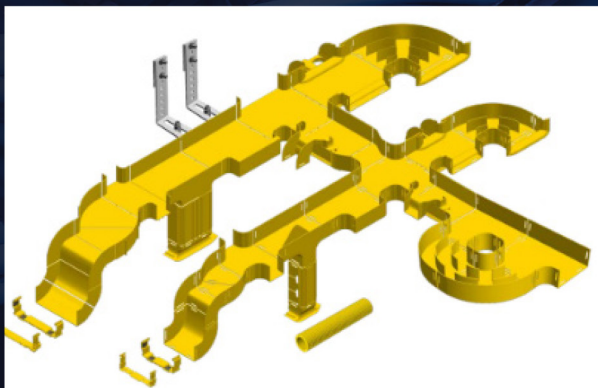
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CHRIS FRAZER

PRINCIPAL CONSULTANT AT LAYER ZERO SERVICES

Putting 1.6Tb/s in perspective, it's 160,000 times greater than where we started with 10Mb/s Ethernet! Recent data rate increases appear exponential and likely to continue. Most data centres are built for longevity, so planning for future change within their design is essential.

The 7-layer OSI model defines the framework for network communication. The OSI model has 'application' at Layer 7, which is where the data workload sits, while Layer 1 defines the signal transmission, via transceivers, on to the cabling. Along with containment, cabinets, frames etc, I refer to cabling as Layer Zero, as the OSI model doesn't cover elements related to ICT passive infrastructure.

There are already multiple 1.6Tb/s transceiver options with different interfaces to the optical fibre. Therefore, when it comes to planning ahead, you might not know what data rate needs to be supported, what optical fibre interface is required or what connectors are to be used – even in two years' time.

I consider it vital to put extensive and well planned fibre containment at the top of any Layer Zero design list. So what else is there? The need to keep the number of fibre hops as low as possible is important,

and the use of strategically placed optical distribution frames housing thousands of connections can help with ever-changing cabinet to cabinet cable configurations.



I don't consider it practical to manage such a high number of connections and links outside of an electronic cable management system, without which I feel sure that you would soon hear people saying, 'I'm not disconnecting that link because I don't know where it goes and I don't know if it is live'. This could lead to lots of abandoned links in the future which might choke the containment.

If designing a data centre now, could 1.6Tb/s possibly be surpassed by the time it's operational? Even if it isn't, the whole of Layer Zero must still support future change. Whilst most elements of a data centre are critical, consider fibre cores as the arteries – delicate but nothing works without them. Appropriately sized containment, fibre frames and electronic cable management are all day one design fundamentals. Ignore them at your peril!

'IF DESIGNING A DATA CENTRE NOW, COULD 1.6TB/S POSSIBLY BE SURPASSED BY THE TIME IT'S OPERATIONAL? EVEN IF IT ISN'T, THE WHOLE OF LAYER ZERO MUST STILL SUPPORT FUTURE CHANGE.'

CINDY RYBORZ

MARKETING MANAGER DATA CENTRE EMEA AT CORNING OPTICAL COMMUNICATIONS

Given the pace of data centre connectivity development over the years, a watchful eye on future proofing for higher speeds has always been a necessity. The move to 1.6Tb/s systems, however, represents a real step-change for operators, with new design challenges and a fundamental shift in architectures.

At these speeds, signal integrity, port density and cooling become the dominant design challenges. With the massive data throughput and high speed interconnections necessary for AI data centres, maintaining a strict loss budget is particularly key. Operators should plan for shorter electrical reaches, fewer retimers and clearer separation between in-rack copper and inter-rack optical fibre domains. This will see fibre pushed closer to the application specific integrated circuit (ASIC) to preserve signal margin and reduce power overheads.

It's no secret that cooling is one of the major considerations for AI data centres, given the immense heat density of modern GPUs, and many operators will be exploring liquid cooling solutions. However, operators must also be mindful that an excess of cable assemblies – such as dense fibre deployments – can impact cooling efficiency and airflow in systems that rely on air cooling. With air cooling (~20 per cent) remaining part of the mix in certain areas of the data centre, carefully managing cable density and airflow will

continue to be key.

With AI models scaling to clusters of up to a million GPUs, modular and scalable cabling architectures are becoming crucial for future proofing. Fundamental to keeping complexity and cost under control is leveraging high density fibre systems such as MMC or MPO-based parallel optics, structured fibre trunks and breakout ready architectures. This helps to scale bandwidth without proportional increases in cabling volume or operational effort. Standardising on fewer connector types and clearly defined reach classes also simplifies splicing and reduces operational risk.

Finally, operators should also be treating co-packaged optics (CPO) and near packaged optics (NPO) as part of their medium-term roadmap. While pluggables will remain critical, CPO addresses the power and density limits exposed at 1.6Tb/s and beyond by removing long electrical channels altogether. Designing facilities that can accommodate both models ensures flexibility as ecosystems mature.



'WITH THE MASSIVE DATA THROUGHPUT AND HIGH SPEED INTERCONNECTIONS NECESSARY FOR AI DATA CENTRES, MAINTAINING A STRICT LOSS BUDGET IS PARTICULARLY KEY.'

RACHID AIT BEN ALI

PRODUCT & SOLUTIONS MANAGER SMART BUILDING & DATA CENTRE AT AGINODE

1.6Tb/s readiness starts with treating the physical layer as a long-term platform, not a last minute add-on. As speeds rise, loss budgets tighten and the operational tolerance for 'messy' cabling disappears. Therefore, the aim is scalable density with predictable performance and controlled change.

Align cabling to the optics roadmap. Design your optical fibre architecture around emerging 8-lane/16-lane ecosystems (Base-8/ Base-16), so you don't strand fibres or create awkward upgrade steps. The right multi-fibre push-on (MPO) trunking/hybrid approach improves fibre utilisation and avoids costly rework as you move from 800Gb/s to 1.6Tb/s.

Engineer for signal integrity and use structured pathways and protected routing that preserve bend radius, reduce micro-bends, and minimise handling damage. Good containment, separation and disciplined patching make link performance more consistent at higher speeds.

Plan density and thermals together. Higher port counts bring more cabling close to hot, high power racks. Cable bulk that blocks intakes/exhausts drives hotspots and cooling inefficiency. Use high density cable management, right-sized pathways, clean slack storage and well-sealed penetrations

to keep airflow intact.

Reduce complexity with modularity.

Pre-terminated, high density systems speed deployment, cut installation errors and make expansions repeatable. They often use less pathway space too. Also, maintain operational control. Standardise labelling and patching, and use strong documentation practices so moves, adds and changes (MACs) stay auditable and low risk.

In short, build Base-8/16-ready structured fibre, protect signal integrity through disciplined routing, keep airflow clear in dense racks, and use modular, well-documented connectivity. This will scale 1.6Tb/s without runaway complexity or cost.



'1.6TB/S READINESS STARTS WITH TREATING THE PHYSICAL LAYER AS A LONG-TERM PLATFORM, NOT A LAST MINUTE ADD-ON. AS SPEEDS RISE, LOSS BUDGETS TIGHTEN AND THE OPERATIONAL TOLERANCE FOR "MESSY" CABLING DISAPPEARS – SO THE AIM IS SCALABLE DENSITY WITH PREDICTABLE PERFORMANCE AND CONTROLLED CHANGE.'

Faster Installs. Smarter Power. Zero Complexity.

Managing and installing a rack power distribution unit (PDU) has never been easier than with the EL2P PDU. **Designed to simplify deployment and take the stress out of power distribution**, this intelligent PDU helps reclaim valuable hours.

- ▶ **Seamless Integration, No Extra Hardware:** Built-in data collectors eliminate clutter and the need for secondary devices
- ▶ **Advanced Connectivity, Maximum Control:** Dual 1GB Ethernet ports, Wi-Fi and Bluetooth allow for real-time power management anywhere
- ▶ **Plug and Play Integration:** Seamless integration with third-party DCIM applications



For more information, visit panduit.com/el2p

PANDUIT™



Why easier, faster RJ-45 matters more than ever

The latest RJ-45 module approach from R&M is designed to enhance practicality and simplify

▶ In today's LAN projects, performance is just part of the story. The challenges are broader and affect planning, purchasing and installation. Working with too many product variants can slow specification and countless part numbers can complicate procurement. An excess of separate components on-site can make the termination process a frustrating, time-consuming exercise. For installers, planners and buyers alike, this can cause delays, rework and unnecessary cost.

Rather than adding yet another layer of complexity, the latest RJ-45 module approach from R&M is designed to make things more practical.



One for all

When connection modules vary too widely in format and mounting requirements, planners spend more time checking compatibility. Meanwhile, purchasing teams have to manage more stock keeping units (SKUs) and warehouse stock. R&M's answer is a harmonised RJ-45 portfolio built around a universal design.

By reducing the number of variants to a more focused offering, the approach makes it faster to choose the right module for the application. For specifiers, that means less searching through catalogues. For buyers, it means fewer part

numbers to handle. For warehouses, it means lower complexity. The result is a smoother route from design to delivery.

Efficiency drive

Another common issue is installation efficiency. Traditional module termination can involve several separate steps, specialist tools and small loose parts that are all too easy to drop, lose or fit incorrectly. On busy jobs, those seconds and mistakes add up quickly.

R&M addresses this with Easy Lock quick-mounting technology. Wire guiding, conductor connection and housing closure are brought together in a single, tool-free step. In practice, that means faster termination, less handling and a simpler workflow on-site. For contractors under pressure to deliver on time, that matters.

Right first time

The design is not only about speed – it's also about getting the job right first time. The more separate actions and parts an installer needs to manage, the greater the chance of error.

In R&M's harmonised RJ-45 portfolio, colour coding supports accurate termination. Strain relief helps protect transmission performance by reducing the impact of cable movement, while dust protection supports cleaner, safer patching environments.

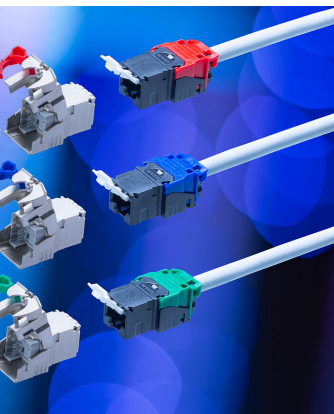
Compatibility is another area in which projects can lose momentum. If modules require extra



connectivity



fy installation



adaptors or special handling to fit into outlets and patch panels, installation becomes overly complicated.

Modernised RJ-45 modules fit all network outlets and patch panels in the R&Mfreenet system without additional adaptors, simplifying rollout across

structured LAN environments. Separate adaptors are available for third-party products where needed, giving planners more flexibility without making the core system more cumbersome.

Reliable performance

Performance, of course, remains essential. As networks support ever-higher traffic demands across offices, buildings and IT environments, connectivity must remain dependable.

The Cat.6A EL 4.0 range is designed for applications up to 10 Gigabit Ethernet. In the

unshielded Cat.6A version, metal fibres in the plastic housing help reduce alien crosstalk, addressing a known cause of signal degradation. The ISO module range provides additional system margins and supports transmission rates of up to 40Gb/s.

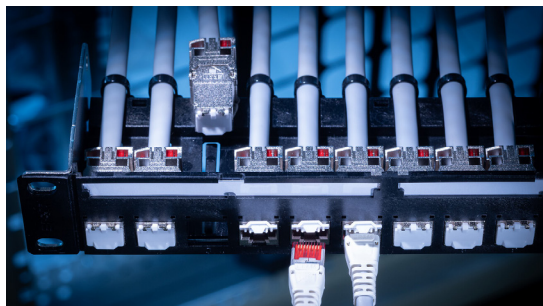
Packaging has a direct impact on-site efficiency and sustainability. Moving away from plastic towards paper bags and recycled cardboard reduces packaging waste and makes modules quicker to access on-site.

Problem solver

In short, R&M's new harmonised RJ-45 portfolio is designed to solve real problems by making planning simpler, installation faster, performance more reliable and logistics less burdensome. R&Mfreenet EL4.0 RJ-45 connection modules offer a standardised, scalable approach to structured cabling for office building and enterprise networks. The EL 4.0 portfolio supports Cat.5e, Cat.6 and Cat.6A, ensuring dependable data transmission speeds of up to 10GBASE-T.

CLICK HERE to find out more.

www.rdm.com



Energy flow

Ben Pritchard of AVK explains how smarter power infrastructure can help achieve net-zero targets

▶ As our digital ecosystem faces mounting pressure to decarbonise and increase energy efficiency, the spotlight is intensifying on the resilience and intelligence of critical power infrastructure. With highly ambitious net-zero commitments now firmly on the agenda, the success or failure of sustainability strategies could hinge on how energy is managed, not just produced.

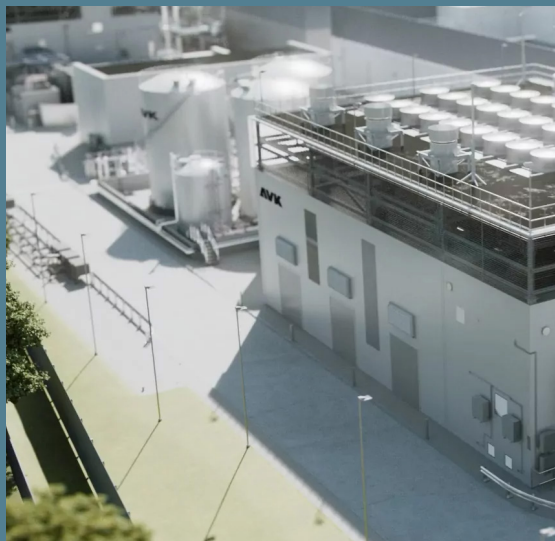
ZEROING IN

Whether it's data centres, pharmaceuticals, chemicals, water treatment or food and beverage processing, energy intensive sectors require uninterrupted power to maintain throughput, ensure safety and comply with regulations. But can these same industries afford to stick with traditional energy systems while simultaneously trying to shrink their carbon footprints?

Smarter, more resilient power infrastructure can enable organisations in energy intensive industries to accelerate decarbonisation, enhance operational efficiency and prepare for a more flexible, data driven energy future. This is particularly the case for data centres.

ENERGY STRATEGISTS

Historically, energy infrastructure has been treated as a fixed cost and static necessity – if the power was flowing, its configuration wasn't often scrutinised unless something failed. But today's landscape has fundamentally evolved.



Modern power systems are becoming dynamic assets capable of contributing to sustainability goals, enabling real-time energy optimisation and supporting resilience amid grid volatility. Data centre operators are transitioning from passive energy consumers to active energy strategists.

This shift is especially critical as the UK grid undergoes rapid decarbonisation, phasing out coal, reducing reliance on gas and integrating more renewables. While this progress is welcome, it also introduces intermittency and complexity. Grid events, from voltage dips to outages, now happen more frequently, putting sensitive operations at risk. Smart power infrastructure, particularly that which combines

‘A microgrid operating in “island mode” can power critical systems during blackouts, while under normal conditions, smart controls can optimise energy draw based on carbon intensity or cost signals from the grid.’



real-time monitoring, advanced analytics and adaptive load balancing, offers a way to counter these challenges, while also unlocking carbon and cost savings.

MODULAR POWER

One of the most promising developments for high demand data centre facilities is the rise of modular, decentralised energy systems, including microgrids. These can incorporate renewables (such as solar or wind), battery storage and low emission back-up fuels like hydrotreated vegetable oil (HVO) or hydrogen ready generators.

The key benefits here are primarily dual – resilience and sustainability. By generating and managing power on-site, data centre operators can mitigate risks associated with grid constraints while also reducing

emissions. A microgrid operating in ‘island mode’ can power critical systems during blackouts, while under normal conditions smart controls can optimise energy draw based on carbon intensity or cost signals from the grid.

The modular nature of such systems also makes them adaptable to future requirements. Facilities can scale or update components without a wholesale overhaul, which is especially useful in energy intensive sectors where change often comes incrementally and under tight return on investment (ROI) scrutiny.

Furthermore, these systems are increasingly integrated with intelligent monitoring platforms. With live data on power loads, equipment performance and environmental impact, energy management becomes proactive rather than reactive. Predictive analytics can flag inefficiencies or pre-empt failure, helping engineers prioritise upgrades that deliver measurable gains.

EMISSIONS REDUCTIONS

Traditionally, diesel generators have been the default for emergency power. While reliable, they contribute significantly to Scope 1 emissions and often fail to meet today’s environmental benchmarks.

Newer fuels such as HVO, a renewable diesel made from waste vegetable fats and oils, can offer up to 90 per cent reduction in lifecycle CO₂ emissions compared to traditional fossil diesel, with no compromise on performance. It’s a plug and play solution

that requires minimal retrofit of existing assets. For facilities with legacy generator fleets, this can represent a significant and fast-tracked sustainability win.

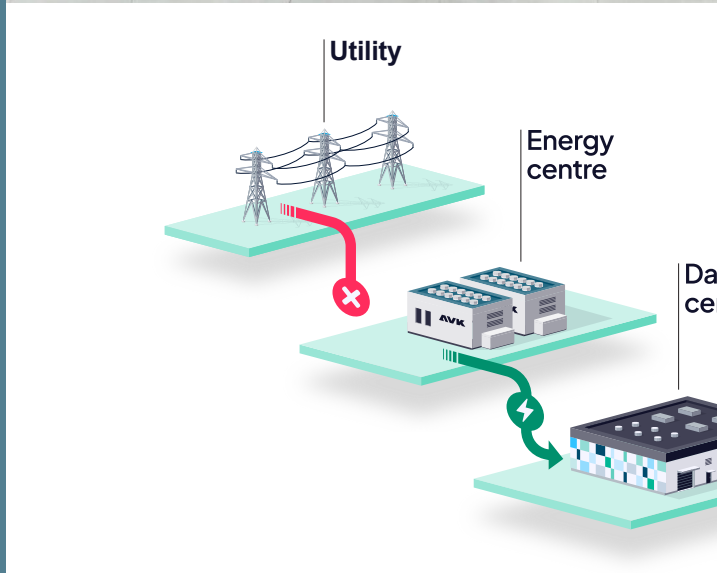
In parallel, interest is rising in hydrogen as a longer-term solution, particularly as availability and storage technologies mature. Some new generation back-up systems are already being built hydrogen ready, giving industry leaders the option to future proof their investment against emerging green fuel regulations.

A NET-ZERO MINDSET

Despite the technical solutions now available, a large proportion of industrial facilities still treat back-up power and grid integration as afterthoughts. Yet, in the context of rising energy prices, regulatory scrutiny and decarbonisation targets, energy infrastructure must be part of the core operational strategy – not simply a compliance checkbox exercise.

A net-zero mindset demands a reassessment of key legacy assumptions:

- Is the existing power infrastructure fit for future electrification advancements?
- Can it support the adoption of heat pumps, electric boilers or other low



carbon technologies?

- Is it agile enough to respond to dynamic pricing or grid decarbonisation signals?

Designing with flexibility, resilience and sustainability from the outset, whether in new builds or retrofit projects, is key to meeting these challenges head-on.



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Procurement, operations and sustainability teams must collaborate to define what future ready power infrastructure looks like in their specific context.

SMARTER POWER

Beyond environmental performance, there is a compelling financial case for smarter power infrastructure in energy intensive industries. Energy costs are among the most volatile and high impact line items for manufacturers. Intelligent load management, power factor correction and real-time monitoring can significantly reduce wastage and lower operational expenditure.

Similarly, the reputational benefits of low carbon operations are increasingly translating into a competitive advantage, particularly for suppliers in regulated sectors or those subject to environmental, social and governance (ESG) disclosure requirements. There's also the challenge of resilience. With the UK reporting more

frequent grid constraint events, power security is no longer just a technical concern, it's a genuine business continuity issue. Downtime can be catastrophic in terms of product loss, safety and cost.

HITTING THE TARGET

Innovative power infrastructure provides organisations with the tools to avoid these pitfalls while advancing toward sustainability targets. As energy becomes a strategic differentiator, it's those who embrace this shift early who will be best positioned to thrive in a carbon conscious world. ■



BEN PRITCHARD

Ben Pritchard is CEO of AVK. With over a decade of experience managing and delivering complete end to end critical power projects, numerous hyperscale data centre owners and operators trust Pritchard's experience and extensive knowledge of energy technology to successfully deliver multimillion pound contracts.

Prevention is better than cure

Preventative maintenance isn't glamorous but, as [Graham Hunt](#) of Centiel explains, it's mission critical

▶ Preventative maintenance contracts for uninterruptible power supply (UPS) systems aren't exactly dinner party conversation and they certainly don't feel urgent when everything is running smoothly. However, they are mission critical. If a data centre fails, reputations can be ruined, clients lost and revenue detrimentally impacted over the long-term.

HEART OF THE MATTER

The UPS is at the heart of any facility and critical load and maintenance is the most important aspect – probably more than buying the UPS in the first place. Preventative maintenance ensures the system is always available and running at its optimum performance. This is particularly important for data centres where Power Usage Effectiveness (PUE) is the main driver, as a well run UPS system can offer huge savings in energy.

A UPS exists for one reason – to protect you when things go wrong. It quietly guards your critical systems, waiting for that split second when mains power fails. And when it's needed, it must perform flawlessly. Preventative maintenance ensures that it does. Without it, you're not just risking inefficiency, you're risking catastrophic failure.

SHORT-TERM THINKING

It's surprising how many organisations invest in high end UPS systems and then fail to maintain them properly. Often, once

the UPS has been commissioned, ongoing maintenance simply isn't front of mind.

But neglect can lead to an invalidated warranty, reduced efficiency and higher running costs, leading to increased utility bills, premature component failure and battery degradation. In turn, this leads to unexpected downtime, emergency callouts and potential catastrophic operational failure.

Not maintaining a UPS will be an expensive lesson when the power fails. And the stakes are high.

DO IT PROPERLY

Six monthly preventative maintenance visits are recommended because critical systems deserve proactive care, not reactive panic. It also enables any potential issues to be noted, rectified and resolved.

During a scheduled visit, engineers must conduct thorough inspections including physical checks of components, cabling and consumables, such as AC and DC capacitors, and investigate any raised warning indicators. Environmental checks ensure that the system is housed at the correct temperature. Dust is one of the most common and overlooked threats to UPS



'It's surprising how many organisations invest in high end UPS systems and then fail to maintain them properly.'

reliability and must be checked for, while batteries and associated DC cabling should be tested to identify any hidden weaknesses.

Maintenance for standalone systems must be carried out while the UPS is safely in bypass mode. This means engineers can inspect the rectifier, inverter and static switch. For modular systems, these elements should be checked within each module individually. However, a real benefit of modular UPS is that this architecture offers true concurrent maintainability. This means full maintenance without the need for switching the load.

Just like a stamped service book for your car, every maintenance visit should include a detailed report outlining any immediate issues that require attention, advisories and system performance observations.



INVESTMENT ADVICE

Maintenance costs money but failure costs far more. Think about the risk of lost revenue during downtime, data loss, reputational damage, compliance breaches, emergency call out and repair costs, as well as overall operational disruption. UPS systems are critical systems.

If they are inefficient, they cost more to run. If they fail, the consequences can be catastrophic.

When you lay it out like this, the importance of preventative maintenance seems obvious. Yet time and again, businesses delay or skip maintenance because everything 'seems fine'. Until it

isn't. If you've invested in a high end UPS system, use the manufacturer's service team – they know the systems inside and out, and have access to remedials and firmware updates.

When the power goes out, your UPS is the only thing standing between continuity and chaos. Preventative maintenance contracts are a 'safety net' while the UPS itself is the insurance policy. It's more like capital expenditure protection – protecting what you have invested in and making sure it is optimised for the long-term.

EFFICIENCY DRIVE

Your UPS preventive maintenance contract may not be glamorous or the subject for dinner conversation. But it's mission critical and when it saves your business, it will be invaluable. ■



GRAHAM HUNT

Graham Hunt is service sales manager at Centiel. He has 35 years' experience in the UPS sector, working in sales and service delivery for several leading brands.

Legrand

Keor FLEX is Legrand's next generation high efficiency modular UPS, engineered to support the growing power demands of AI-driven, cloud, colocation and edge data centres. Designed for flexibility and resilience, Keor FLEX enables real-time power scalability from 1200kW in a single frame to up to 4.8MW in parallel, ensuring the infrastructure can adapt as capacity requirements evolve.

Delivering up to 98.6 per cent efficiency, Keor FLEX helps reduce operational expenditure, cooling demands and total cost of ownership. Its modular architecture includes hot-swappable power and bypass



modules, enabling maintenance or expansion without downtime. A compact footprint maximises valuable white space, while advanced monitoring and predictive analytics support proactive power management.

With smart grid readiness and bidirectional rectifier technology, Keor FLEX also supports the integration of renewable energy sources, helping operators meet sustainability goals while maintaining high levels of power reliability and performance.

CLICK HERE to find out more.
www.legrand.com/datacenter/gb-en

Schneider Electric

Schneider Electric's Easy UPS 3-Phase Modular is a robust UPS designed to protect critical loads. Easy UPS 3-Phase Modular is available in 50-250kW capacity with N+1 scalable configuration and supports the EcoStruxure architecture, which offers remote monitoring services.

With scalability top of mind, Easy UPS 3-Phase Modular enables you to pay as you grow, allowing you to optimise capital investment. It is a part of Schneider Electric's Green Premium portfolio, which ensures energy efficiency, durability, recyclability and transparency to help reduce environmental footprint.

In addition, this system features advanced technology such as a high efficiency design, intelligent battery management, real time monitoring and control capabilities. These features combine to make it one of the most cost effective and energy efficient UPS solutions.

To find out more **CLICK HERE**.

www.se.com



Mayflex

Uninterruptible power is a critical part of every resilient network and **Mayflex** is proud to offer a strong UPS portfolio featuring **APC** and **Uniti**.

APC brings industry leading reliability, high efficiency power protection and advanced battery management designed to safeguard essential infrastructure. **Uniti** complements this with robust, value driven UPS systems that offer flexible runtimes, intelligent monitoring and dependable performance.

By partnering with both **APC** and **Uniti**, **Mayflex** gives customers genuine choice – ensuring every requirement, budget and

environment is supported with the right solution. But our commitment doesn't stop at product range. At **Mayflex**, we are Driven to Deliver More – more expertise, more availability and more support from a team that understands the critical role power resilience plays in modern networks.

Whether you're designing a new installation or upgrading existing systems, **Mayflex** is the trusted partner to deliver the UPS

solutions you need.

For more information [CLICK HERE](#), to email the Mayflex sales team [CLICK HERE](#) or call 0800 757565.

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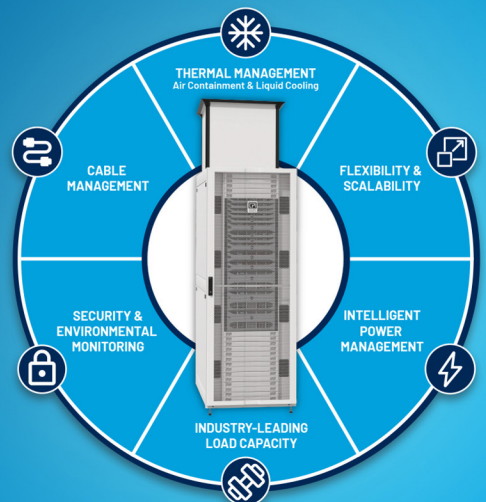
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Panduit

Panduit's EL2P iPDU is engineered to redefine power management in data centre environments. It targets one of the sector's toughest challenges – maintaining uptime while optimising capacity and sustainability at scale.



The EL2P offers metering accuracy of ± 0.5 per cent. It also delivers granular energy consumption data to support capacity planning, Power Usage Effectiveness (PUE) optimisation and sustainability initiatives.

Flexibility is another key differentiator. Panduit's 4-in-1 outlet design allows each outlet to function as C13, C15, C19 or C21, simplifying deployment and supporting diverse IT loads. Dual Gigabit Ethernet

connectivity with daisy-chain support for up to 64 iPDUs on a single IP address further reduces complexity.

Native Cisco Nexus Dashboard integration provides visibility into energy usage and sustainability metrics, while Redfish and RESTful APIs ensure interoperability with

DCIM and cloud platforms. Secure zero-touch provisioning (szTP) enables rapid, low touch deployment across distributed sites.

Available in single-phase and three-phase models from 5kVA to 43.5kVA for EMEA, with dual rated approvals, the EL2P combines global compliance with practical deployment.

To find out more [CLICK HERE](#).
www.panduit.com

Vertiv

Vertiv's Power Swap Program enables businesses to replace older single-phase UPS systems with innovative, energy efficient Vertiv models, all while minimising costs and environmental impact. As organisations increasingly prioritise responsible practices and operational efficiency, the Vertiv Power Swap Program facilitates the responsible collection, refurbishment and recycling of legacy equipment.

Key program features include:

- **Replacement of legacy systems.** Target and replace single-phase UPS units up to 5kVA from any vendor or manufacturer.
- **Accelerate adoption of high efficiency.**
- **Recycling support.** Encourage responsible



and compliant procedures in handling of old units through certified recycling processes.

- **Empower customers and partners.** Provide end users with cost effective upgrades to reliable critical power infrastructure and resellers with scope for margin expansion.

To find out more [CLICK HERE](#).
www.vertiv.com

Comms Centre

Legrand Keor UPS – from desktop protection to life safety back-up and hyperscale data centre resilience.

Single-phase loads. The line interactive Keor SP covers 600VA-2kVA, with sealed valve regulated lead acid (VRLA) batteries and automatic voltage regulation (AVR) for stabilisation. The Keor SPE offers a pure sine wave rated power from 750VA-3kVA with the RT version offered in a convertible rack/tower configuration. The Keor DK is an online double conversion UPS achieving 96 per cent efficiency, which can be paralleled to offer a higher rated power.

Three-phase loads. The modular Keor MOD is available from 25-250kW with hot-swap modules and the ability to parallel



units up to 600kW. The TriMOD is available from 10-80kW with redundant self-configuring single-phase, while the monolithic Keor HPE boasts three

level insulated gate bipolar transistor (IGBT) technology available from 60-600kVA. The largest in the range is the modular Keor FLEX, offering 98.4 per cent efficiency, scaling to 1.2MW per frame and 4.8MW in parallel, which is ideal for hyperscale and AI-driven data centres.

CLICK HERE to find out more, call 01634 291191 or to send an email **CLICK HERE**.
www.commscentre.com

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Inside Networks

2026 CHARITY GOLF DAY 20TH MAY

An opportunity to compete and entertain clients and colleagues at the prestigious Hanbury Manor PGA Championship Course in aid of Macmillan Cancer Support.

4-ball teams will compete in a 'best 2 from 4' full handicap Stableford competition over 18 holes.

Golf will be preceded by tea, coffee and bacon rolls at registration and followed by a three course private dinner and prizegiving with charity raffle. Teams are invited to provide a raffle/auction prize.

There are opportunities for sponsorship for all aspects of the day - all raising money for Macmillan Cancer Support. Since 2005 this industry event has raised over £130,000.

The cost of a 4-ball team is £900+VAT.
CLICK HERE for further info.

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Powering the future

As AI workloads push UK and Irish data centres to their power limits, resilient uninterruptible power supply (UPS) systems and intelligent power distribution architectures are emerging as the critical enablers of growth. Matthew Baynes of Schneider Electric explains more

▶ Business and governments are seeking growth zones to scale AI's evolution, and the UK and Ireland are becoming the strategic choice. Yet without power there is no compute, and without compute there is no AI. High density AI clusters are driving record demand for capacity, resilience and efficiency – pressuring power grids, extending connection queues and tightening net-zero commitments. In this context, UPS and power distribution should be considered key strategic enablers of the future AI economy.

RACK AND ROLL

Escalating power density is at the heart of the AI scaling challenge. According to McKinsey, traditional racks averaging 8kW are rapidly being replaced by AI workloads consuming over 80kW, with roadmaps targeting 120kW and beyond.

The electrical and thermal stress this places on the upstream infrastructure is significant, meaning it is no longer enough to think only in terms of total MW to site. Operators must now design power trains that can deliver very high and dynamic loads to specific clusters, while maintaining overall resilience. At the same time, the cost and availability of energy are becoming obstacles for new development. The question has changed from 'can we find a site?'

to 'can we secure, move and condition enough power to make the site viable over its lifetime?'

SUPPLY AND DEMAND

This tension is heating up in the UK and Ireland. Demand for new capacity has surged around London and other secondary hubs just as transmission and distribution networks are wrestling with electrification of transport, heating and industry. Grid connection dates that once sat 2-3 years out can now fall well into the next decade, and connection offers frequently arrive with constraints that force developers to rethink



phasing, redundancy levels and even target customer mix.

In response, the UK government has recognised the essential role of data centres, designating them as critical national infrastructure (CNI). This commitment has been reinforced through the AI Opportunities Action Plan where we have seen the emerging AI Growth Zones announced in Scotland, Wales and Northern England.

EFFICIENCY DRIVE

These constraints on the grid elevate the importance of efficient and flexible power distribution. Operators are pushing for architectures that minimise transformation steps, optimise losses at every stage and allow them to run closer to installed capacity without compromising resilience.

Simultaneously, UPS architectures are increasingly becoming more flexible, modular and scalable, enabling operators to align deployment

with real demand instead of building all resilience upfront and carrying the efficiency penalty. Meanwhile, more attention is being paid to distribution topology – how power is segmented, which loads are prioritised under constraint, and how quickly capacity can be reallocated between AI and non-AI workloads as business priorities evolve.

CONDITIONAL EXPANSION

Ireland offers a different but related picture to the UK. For years, the Dublin region has been a magnet for hyperscale investment, but longstanding grid capacity issues led to congestion in the region and a de facto moratorium on many new data centre connections.

That approach is now being refined rather than reversed, shifting from a restrictive to conditional enablement of AI infrastructure. For instance, the Large Energy User Action Plan (LEAP) promotes the creation of ‘green energy’ parks in regional locations. These parks are designed to colocate energy intensive industries with renewable energy sources, like offshore

wind projects on the west coast.

This geographical change is designed to utilise underused parts of the national grid and spread the economic benefits of the tech sector evenly across the country. The framework entails strict conditions around on-site generation, efficiency and flexibility, allowing operators to proceed where they can demonstrate that they will generate as much

energy as they consume or materially support the stability of the grid.

LEADING THE WAY

Operators like Digital Realty and Vantage Data Centers are adapting their strategies in line with these evolving requirements. This means greater emphasis on self-generation, renewable integration

‘UPS and power distribution architectures determine how flexibly a data centre can respond to price signals, grid events or on site generation swings – how efficiently it can use every kW it receives and how quickly it can scale new AI capacity without overinvesting in stranded infrastructure.’



and resilient on-site power infrastructure.

This development in Ireland won't be dissimilar to what many markets will face. Developers are exploring combinations of grid supply, large scale battery storage, small modular reactors and direct connections to renewable assets through private wires or long-term power purchase agreements.

The UPS is no longer simply a last line of defence against short-term outages. It has become an active stabilising layer between multiple power sources and the IT load – capable of smoothing intermittency, participating in demand response and providing a ride through while engines or fuel cells ramp.



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ARCHITECTURAL SHIFT

In the UK and Ireland, a broader shift is emerging away from purely centralised power trains towards more distributed, resilient designs. As stress increases on legacy power distribution models, the same happens for rack power densities.

This leads to high density AI clusters benefitting from power islands that can be planned, built and upgraded semi-independently within a campus. Modular UPS blocks, containerised switchgear and prefabricated power rooms support this efficient approach by enabling faster deployment and easier replication across sites.

As microgrids and behind the meter generation become more common, whether that is a renewable powered sovereign AI cloud in Argyll or a campus colocated with wind and solar, the power distribution design must anticipate multiple

operating modes. This includes grid following, grid supporting and, in some cases, islanded operation for extended periods.

The rise of liquid cooling for AI adds another dimension. UPS systems need to support not only IT loads but also the pumps, controls and safety systems that keep solutions operating safely. Already in constrained regions, operators are beginning to prioritise workloads that can tolerate flexible operating envelopes, using power management and UPS orchestration to shape demand around grid or on-site generation availability.

INDUSTRY RESPONSE

Historically, data centre facilities were treated as passive consumers – they drew power, maintained their own resilience and had limited interaction with the grid beyond basic connection agreements. That model is changing.

In the UK, system operators are now repurposing legacy power infrastructure sites and alongside regulators are increasingly looking to balance a system



with higher levels of renewables such as solar farms. In Ireland, conditional permits explicitly encourage or require microgrid strategies including self-generation, export of surplus power or participation in ancillary services to reduce grid dependency – designing power distribution systems to enable scalability and AI-readiness.

ENERGY HUBS

The AI era demands simultaneous development of digital capacity and energy infrastructure. UPS and power distribution architectures determine how flexibly a data centre can respond to price signals, grid events or on-site generation swings – how efficiently it can use every kW it receives and how quickly it can scale new AI capacity without overinvesting in stranded infrastructure. The path forward will be defined as much by decisions about electrical architecture as by choices of hardware or location. In the age of AI, UPS and power distribution are not simply protective layers, but the foundation on which the future of UK and Irish AI will stand. ■



MATTHEW BAYNES

Matthew Baynes is vice president for Schneider Electric's Secure Power and Data Centre Division in the UK and Ireland. With over 20 years' experience across the data centre, IT and critical power industries, Baynes works closely with Schneider Electric's customer and partner ecosystems to support the design, build and operation of next generation, sustainable, AI infrastructure.

Howard Pheby joins Stellanor as chief commercial officer

Stellanor has appointed Howard Pheby as chief commercial officer. He brings over 30 years of data centre industry experience across hyperscale, wholesale and retail colocation markets.

Pheby joins Stellanor from Pure Data Centres, where he served as business development director for nearly 10 years, leading commercial strategy across the UK, Europe and Middle East markets. His career includes senior commercial roles at Telehouse Europe, Rack Centre and Colt Telecom.

‘Two to 10 facilities in six months

tells you everything about execution capability,’ said Pheby. ‘This Stellanor team has extensive experience in building,

integrating and scaling data centre platforms. I’m here to help turn that infrastructure momentum into commercial success.’

Pheby’s appointment comes as Stellanor completes significant platform expansion. Following its September 2025 launch with two London facilities acquired from Colt Technology Services, the company acquired an additional eight UK data centres from Redcentric.



Howard Pheby

Pure Data Centres appoints Gary Wojtaszek to drive the next stage of expansion

Pure Data Centres has appointed Gary Wojtaszek as executive chairman and interim CEO. Wojtaszek previously led CyrusOne through a period of transformational growth, scaling it into one of the world’s largest operators before its \$15bn acquisition by KKR and Global Infrastructure Partners.

Wojtaszek’s track record of building, operating and scaling hyperscale platforms at global scale positions Pure DC to capitalise on the accelerating AI opportunity across Europe and the Middle East. As AI demand

begins to reshape European digital infrastructure, the company is expanding both within constrained cloud availability zones and into large scale AI campuses.

‘The AI wave that transformed the US market is now emerging across Europe, and the opportunity to scale a focused, high quality platform at this moment is compelling,’ said Wojtaszek ‘Our objective is clear – expand in supply constrained core markets, deliver for hyperscale and

AI customers at the highest standards and develop the next generation of large scale AI campuses across the region.’



Gary Wojtaszek

MLL Telecom promotes Stuart Wallis as CEO

MLL Telecom has appointed Stuart Wallis as CEO, which follows Shaun Ledgerwood's decision to step down after six years in the role. Previously, Wallis served as the company's chief commercial officer for five years and has been a member of MLL's senior leadership team since 2019.

Wallis has over 25 years of experience in the telecom sector gained in Europe, the Middle East and Asia, including engineering roles at Nokia, Ericsson and Nortel before joining MLL in 2010. Through his various director level operational and commercial roles at MLL, his drive and focus have established the company as a leader in network design, build and management.



'I am honoured to be taking over from Shaun, who has worked tirelessly over the last six years to develop and grow MLL,' said Wallis. 'I am also very excited to be leading a company that has over the last 35 years enabled digital transformation from 1G to 5G in the UK mobile sector and is a trusted provider of cutting edge secure digital communications across the UK public sector. I've seen first-hand what a fantastic team we have and I look forward to continuing that strong teamwork into the future.'

CHANNEL UPDATE IN BRIEF

Colt Technology Services has been named as one of the first AWS European Sovereign Cloud connectivity partners, delivering secure, high performance connectivity to the AWS European Sovereign Cloud. The AWS European Sovereign Cloud is a new, independent cloud for Europe, designed to help organisations meet stringent sovereignty and compliance needs.

Red Helix has appointed Simon Michie as managing director of Risk Crew, its specialist information security governance, risk and compliance consultancy. The appointment strengthens Red Helix's ability to support organisations across the full security lifecycle – from assessing risk and improving resilience to delivering 24/7 protection, detection, security testing and incident response.

MicroCare has appointed Uwe Wanner as director of research and development. In this role, Wanner will lead the company's global strategy, advancing innovation, regulatory excellence and product development.

Inttelo AI has appointed Julia Fernandez Clavera as its AI solutions director for EMEA. She will lead all prospect and customer engagement for hotels and operators across EMEA as they implement Inttelo's platform.

Let there be light

In this month's Knowledge Bank, where tech is demystified, [Carrie Goetz](#) looks at multimode and singlemode optical fibre selection decisions

▶ Networking communications are a culmination of the components at each end of a communication link and the physical channel. A single server generally has two network cards, dual storage connections and management appliances tied together via management communications links. There may be dual management networks for in band (runs over the network) and out of band (separate management network).

SELECTION PROCEDURE

When choosing components for the tasks above, decision factors include speed, longevity, cost and sometimes distance. One methodology is to use the same infrastructure for everything. This results in fewer pieces and parts to maintain for multiple different networks.

Another methodology is to put in the minimum required for today's installation. This shortsighted approach may increase costs over time compared to installing components supporting future needs up front. Others allow each active department team to pick their own physical infrastructure, meaning data centre personnel must support a wide range of products across departments. Often, these components change with each speed increase or equipment refresh.

GOING THE DISTANCE

One of the first considerations is the system's lifecycle. Anytime you install something with a shorter lifecycle, it may need replacing sooner than something that

lasts longer. But this isn't always true. An installation may be temporary or short-term and may not be expected to increase in speed or demand.

Network management is a very low bandwidth application. 1Gb/s is generally ample and some companies choose to build out separate, and less expensive, management networks for this reason.

Some put management switches at the top of a cabinet and use fibre backbone uplinks. In top of rack switch installations, servers connect to network switch ports in the same cabinet via patch cords instead of a structured channel.

The downside is that you must purchase multiple switches, dedicate a switch to each cabinet and, if a cabinet has few servers installed, port utilisation will be low. As for the management network, low speed network switches are relatively inexpensive, so it's a minor factor. For high speed networking, cost considerations definitely matter and having multiple expensive unused ports in cabinets leads to waste.

MEETING THE NEED

For non-management networking and storage components, we consider



more factors. Our active components refresh typically every 3-5 years. Cabling standards are written for 10-15 years and are then renewed or revised. Networking capabilities, demands and needs change as our computing needs change. Sometimes, equipment is refreshed after a year if it no longer meets business needs.

If you create physical infrastructure

components that last through multiple equipment iterations, you are better off in the long run. Once components are installed, rip and replace

exercises add materials, labour and recycling costs. Plus, we add risk of downtime and project time delays.

MONEY MATTERS

When choosing multimode fibre or singlemode fibre, electronics costs factor into decision making. For a time, singlemode electronics were roughly 10 times the cost of their multimode counterparts. Today, due to hyperscalers and others buying chips in mass, the cost differential now is about two times.

Anytime we add a piece of active electronics to a channel, we must consider the electronics at the other end of the channel. For instance, if a networking team changes switches, the server team must replace networking cards and facilities must change cabling to match the switch port requirements – unless the networking team uses in-situ infrastructure.

IN THE MIX

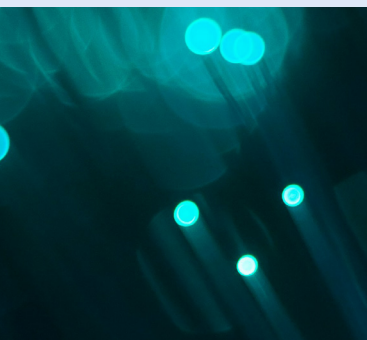
For fibre networking, there may be multiple protocols and multiple speeds. A facility may use multimode for switch to server connections, singlemode for the backbone and singlemode for the fibre channel storage connections. A facility can just as easily use only singlemode everywhere, allowing a channel to serve either Fibre Channel or Ethernet.

Polarity is a two strand consideration in this scenario. For every equipment decision, we must factor in not only the attached fibre channels but also polarity, number of strands, functionality, port utilisation, cost, lifecycle and preferences. Polarity changes across applications, while multiple polarity methods increase complexity. Having a mix of channels increases cord inventories and may introduce unnecessary risks due to complexity.

Singlemode applications are not length restricted within the data centre, unlike many multimode applications. Structured channels, ideally, are in use and active for the longest possible period. The cost to rip out, replace and likely recycle would be part of the cost of ownership calculations.

ON THE WHOLE

To provide the most cost effective, long-term solutions, it is imperative that all impacted departments have a say in selection and commissioning. One bad decision by one department can have detrimental consequences to another. Taking advice from vendors may not be your best bet. Understanding the entire transmission pathway will result in better outcomes. ■



Keeping the lights on

Thomas Ritz of R&M looks at why optical fibre matters to network resilience

▶ Emergency call handling, public warning systems, logistics, energy operations, government digital services and defence readiness all depend on communications networks remaining available even in the most difficult conditions. Network resilience is the ability to withstand disruption and recover quickly.

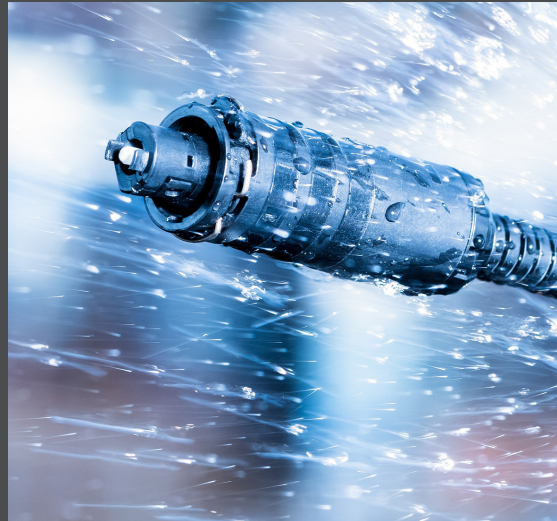
DEFINING MOMENT

Regulators and standards bodies frame resilience as more than just uptime. Ofcom, for example, describes resilience as the ability to resist disruption, withstand partial loss or degradation, recover with minimum reasonable loss of performance and learn from incidents. That definition implies resilience across the full lifecycle – design, build, operate and optimise.

In practical terms, resilient networks share a few basic characteristics. Can users connect when they need to and can priority services be maintained under stress? Is there enough fault tolerance that a single break does not cascade into a wider outage? How quickly can faults be located and service restored? And can the operator demonstrate what happened and what changed through disciplined configuration and change control?

SECURITY AND DEFENCE

Communications infrastructure is widely treated as critical national infrastructure. Disruption in the communications sector can cascade into every other sector and



very quickly affect public services and economic activity. The threat environment has also evolved – cyber and physical risks such as destructive malware, ransomware, supply chain compromise and deliberate damage to infrastructure can be persistent and coordinated.

Submarine fibre cables transport very large volumes of international data, including government and defence communications. The ITU has reported that these cables carry over 99 per cent of international data exchanges and that faults occur regularly worldwide. European analysis also notes that many incidents involve human activity, whether accidental or deliberate.

Resilience therefore includes change control, operational discipline and recovery

‘Preparedness exercises, cross organisational collaboration, clear communications channels and post-incident learning help ensure that technical redundancy translates into real world recoverability.’

planning – not only redundant fibre routes. Continuity of government communications, emergency response and defence mobilisation relies on networks that can absorb shocks and restore service quickly.

NETWORK DESIGN

Most resilience guidance converges on two principles – redundancy (back-up capacity) and diversity (avoiding single routes and shared failure modes). An Organisation for Economic Co-operation and Development (OECD)

review similarly highlights the fact that failures in key components, such as international links and internet exchange points, can have disproportionate impact. In fibre terms, that typically translates into:

- Physically diverse routes between key points, avoiding shared ducts, bridges, tunnels or chambers where feasible. Route diversity should mean more than two fibres laid in the same civil infrastructure.
- Multiple entry points to critical sites such as data centres, public safety answering points, government buildings and defence facilities, so a single excavation, fire or building incident does not isolate the site.
- Ring or mesh topologies where

appropriate, for example, protected core routes and metro rings. Rings are not a panacea if both legs share a common crossing or other constraint.

- Operational diversity where it reduces common mode risk, such as separating domains or suppliers for key functions. This should be deliberate and managed, rather than a by-product of legacy complexity.

A design objective that is often missed is speed and safety of reconfiguration at the passive layer. Recovery fails when restoration activities are slow, error prone or poorly documented. If frames, panels, patching, labelling and fibre management are difficult to inspect and easy to mis-match, added redundancy can increase complexity and extend outage duration.

Passive infrastructure should therefore support high density termination, clear separation of diverse routes and consistent fibre management, including bend radius control, unambiguous labelling and straightforward inspection, so that moves, adds and changes can be carried out quickly and safely.

PRACTICE MAKES PERFECT

Resilience is influenced as much by build choices as by architecture. Practical measures include:

- **Protected routes and hardened civils.** Minimise single points of failure at bridges, rail crossings, shared ducts and street cabinets. Use protected ducts and



physical protection for exposed segments and consider deeper burial where feasible.

- **Separate laterals to critical sites.** Where resilience requirements justify it, provide physically separate laterals entering from different streets and different chambers.
- **Proven components and workmanship.** Make sure to choose ruggedised enclosures suitable for temperature, moisture, dust and vibration. Use tamper resistant access and clear physical security boundaries at points of presence and street cabinets. High quality connectors and splices with stable performance matter at scale, where small quality issues become significant operational problems.
- **Modular, pre-tested assemblies where appropriate.** Prefabrication and pre-termination can reduce field errors, accelerate build and support faster restoration after damage if testing, documentation and spares holdings are designed in from the outset.

Supply chain assurance and supplier transparency also matter, particularly for fixed networks and fibre technology. Incident reporting has repeatedly shown that system failures and human error can dominate the impact of major outages –

both can be reduced through installation quality, change discipline and operational readiness.

QUESTIONS AND ANSWERS

When incidents occur, decision makers need rapid answers – where is the fault, what services are affected and does the pattern suggest accident, degradation or malicious activity? Monitoring, observability and the ability to evidence events are therefore central to resilience. Two complementary capabilities are particularly relevant to fibre heavy networks:

- **Visibility of services through the passive layer.** Where appropriate, passive optical tapping (for example, using splitters) can provide real time visibility of traffic without materially affecting performance. Used selectively, it can support service assurance, incident investigation and faster isolation of abnormal behaviour.
- **Visibility of the passive layer itself.** Operational resilience depends on knowing what is connected, where and in what state. Structured management approaches, such as uniquely identifying



ports, using sensors to confirm connections and providing technician guidance, can reduce human error during urgent repairs and shorten troubleshooting time.

Research is also progressing on optical layer anomaly detection including vibration or disturbance events and indicators of potential tapping, using real time measurements and machine learning. Operators do not need to deploy advanced sensing everywhere to benefit, as targeted monitoring on high risk segments, combined with disciplined passive layer visibility, can materially improve resilience.

TIME TRIAL

Resilience definitions typically emphasise recovery with minimal reasonable loss of performance, which makes mean time to repair (MTTR) a strategic key performance indicator. Achieving fast MTTR depends on:

- Accurate records of routes, fibres, splices and ports
- Clear work instructions and guided patching to prevent mistakes
- Ready spares and field replaceable modules
- Rapid fault localisation including defined optical time domain reflectometer (OTDR) processes and test access points

What's more, resilience improves when networks are treated like emergency systems. Preparedness exercises, cross organisational collaboration, clear communications channels and post-incident

learning help ensure that technical redundancy translates into real world recoverability.

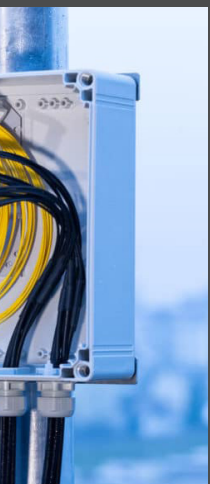
FORM AND FUNCTION

Networks may be targeted through cyberattacks, jamming, outages or physical damage to disrupt command and control, intelligence and logistics. Resilient networks are designed to keep functioning, contain problems and recover quickly. Fibre brings advantages but resilience is delivered by diverse physical routes, architectures that avoid common points of failure, hardened edge infrastructure and operations that can see, evidence and restore service quickly. ■



THOMAS RITZ

Thomas Ritz is market manager public networks at R&M. He is an electrical engineer with skills in communication networks and RF-technology, fibre optic telecom, testing and sensor applications. He has worked in international, technology based solution selling for over 30 years and has leadership experience in international sales and strategic marketing.



Quickclicks

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

The **European Data Centre Association (EUDCA)** has published its annual 2026 State of European Data Centres report. [CLICK HERE](#) to get a copy.

The Great Connectivity Convergence: NTN In Industrial IoT is a report from **Viasat** that has found that direct to device (D2D) connectivity will underpin the next generation of industrial IoT.

[CLICK HERE](#) to read it.

Building A More Sustainable Digital Future is a blog by John Siemon of **Siemon**. [CLICK HERE](#) to read it.

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The **Wireless Broadband Alliance (WBA)** has released its latest report titled **Connectivity Strategies For Smart Multi-Dwelling Units (MDUs): Convergence For Connected Living At Scale**. It presents a clear, standard based blueprint for transforming residential properties into fully connected smart communities. **CLICK HERE** to download a copy.

BCS Consultancy has published its latest industry report – **Data Centre Truths 2026: What It Takes To Deliver In 2026**. Based on insights from more than 3,000 respondents across 41 countries, the report examines the real constraints shaping delivery across Europe. **CLICK HERE** to download a copy.

800VDC Power Delivery Architecture And Advantages For Next-Generation AI and GPU Data Centers is a white paper from **Entelligent**. **CLICK HERE** to request a copy.

Effective Techniques For Long Reach Cable Testing is a blog by **AEM Precision Cable Test**. **CLICK HERE** to read it.



Sizing it up

Nash Maharaj of Vertiv examines the rise of micro-modular data centres and how they are empowering the edge computing revolution

▶ With edge computing growing in popularity, driven by applications using technologies such as AI, the IoT and real-time analytics, organisations are seeking ways to process data closer to its source. This shift reduces latency, enhances reliability and supports mission critical operations that can't afford even a millisecond of delay. Enter the micro-modular data centre – a compact, efficient and versatile solution that's redefining how businesses deploy IT infrastructure at the edge of the network.

MEETING THE NEED

Micro-modular data centres represent the pinnacle of innovation in prefabricated IT systems. They encapsulate the core functionalities of traditional data centres into a single, self-contained unit, typically housed within one standard IT rack.

This design makes them ideal for facilities where space is limited and rapid deployment is essential. As businesses grapple with the exponential growth of edge applications, these solutions offer an affordable, reliable alternative to sprawling data halls. They support critical loads of up to 100-150kW, providing just enough power for localised computing without the overhead of larger facilities.

At their heart, micro-modular data centres are built for resilience and efficiency in challenging settings. Unlike conventional set-ups that require piecing together disparate components on-site,

these systems arrive pre-integrated from the factory. This plug and play approach allows for deployment in hours, often without needing external contractors. This enables businesses to quickly scale their IT capabilities to meet evolving demands, whether in urban offices, rural outposts or industrial sites.

CORE COMPONENTS

What sets micro-modular data centres apart is the comprehensive integration of essential data centre elements into a minimised footprint. In essence, it is a fully fledged data centre shrunk down to fit neatly into a single rack, complete with everything needed to safeguard and operate sensitive IT equipment.

The foundational components typically include an uninterruptible power supply (UPS) to enable continuous operation during outages, a rack power distribution unit (rPDU) for efficient energy management, and integrated rack cooling units with climatic controls and heat rejection systems. These elements work in tandem to maintain optimal temperatures and humidity, preventing overheating in even the most demanding environments. Remote monitoring sensors and software are also standard, offering real-time insights into system performance and enabling proactive maintenance.

ONE STEP FURTHER

Many models go further, incorporating



advanced features like back-up fan systems for redundancy, physical security measures such as locks and access controls, fire suppression systems to mitigate risks, shock absorption for stability in seismic prone areas and power conditioning to filter out electrical noise. Customisation is a key benefit. Users can add optional features like cable management tools, blanking panels or airflow optimisation solutions to modify the set-up for specific needs.

This pre-integration isn't just about convenience, it's about reliability. Components are tested in the factory to allow for seamless compatibility, reducing the risk of on-site failures. For IT managers overseeing distributed networks, this

'As organisations continue to decentralise their digital infrastructure, micro-modular data centres will play a pivotal role. They embody the future of computing.'

means less time troubleshooting and more time focusing on strategic initiatives. Micro-modular data centres transform what could be a complex engineering project into a straightforward, ready to deploy asset.

SPOT THE DIFFERENCE

While micro-modular data centres fall under the broader umbrella of

prefabricated and modular systems, they occupy a unique niche. The prefabricated data centre market is booming as IT leaders seek agile ways to expand capacity near end users. Understanding the distinctions helps clarify why micro-modular options can be the go-to for edge deployments.

First, consider mini data centres, which are similar in concept but differ in scale. Both are miniaturised versions of traditional data centres, prefabricated

for edge computing use. However, terms like ‘micro’ and ‘mini’ are sometimes used interchangeably, leading to confusion. A true micro data centre is limited to one rack, whereas mini data centres typically accommodate 5-20 racks. Still a fraction of the thousands in large scale facilities, but enough for mid-sized operations.

SPACE RACE

Micro-modular data centres emphasise modularity, as the name suggests. They feature self-contained IT cabinets tightly encapsulated in their own technical space, often allowing multiple units to be deployed and integrated in a building block fashion. This modularity enables scalability. Organisations can start with one rack and add more as needs grow, all while maintaining a compact footprint.

In contrast, prefabricated modular data centres are larger facilities, designed for standalone installations in remote or outdoor locations. They come in bigger modules that can be stacked or expanded in predefined blocks to handle substantial capacity. These are suited for scenarios where high density computing is required away from main buildings, such as in disaster recovery sites or expansive campuses.

The key differentiator for micro-modular data centres is their focus on small footprint, high reliability deployments. They aren’t designed with replacing enterprise data centres in mind, rather augmenting them at the network’s edge, where proximity to users and devices is paramount.

GAINING TRACTION

The surge in adoption of micro-modular data centres isn’t accidental. It’s driven by compelling benefits that address the pain

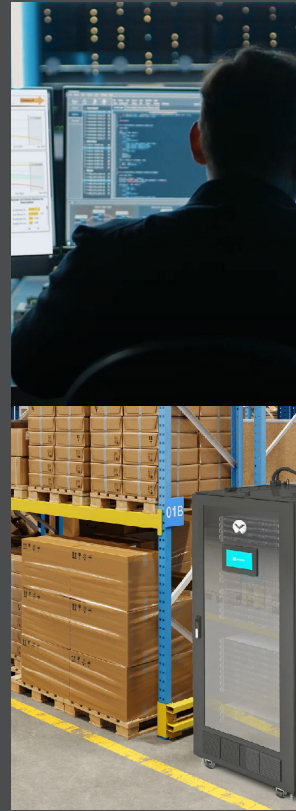
points of modern IT management.

Speed and convenience are top the list. Traditional IT set-ups involve exhaustive specification processes – selecting compatible components, sourcing vendors and coordinating installations. Micro-modular systems bypass this with the heavy lifting done in advance. Deployment can happen in days, not months, making them ideal for time sensitive projects like pop-up retail analytics or emergency response networks.

Seamless integration is another key advantage. Because these systems are pre-engineered, all components are designed to work together, delivering a highly efficient, reliable solution. Many offer true plug and play functionality, where you simply connect power and network cables, and the system is operational.

INTELLIGENT DESIGN

Built-in monitoring elevates micro-modular data centres into smart infrastructure status. Pre-installed sensors and software provide centralised oversight, with visibility down to individual outlets. Remote control via a single IP address is invaluable for unmanned sites, allowing IT teams to manage multiple locations remotely





without the need for on-site personnel.

Customisation options add flexibility without compromising the prefabricated ethos. Organisations can choose from standard sizes, voltage configurations or add-ons to match specific requirements. This balance of standardisation and personalisation streamlines operations across distributed set-ups. At the same time, using the same rack style everywhere simplifies maintenance and training.

Standardisation brings efficiency. In environments with scattered critical loads, a uniform approach reduces complexity for IT staff, cutting costs and errors.

Finally, peace of mind comes from comprehensive warranties covering the entire system. If a component fails, the provider handles repair, replacement and reintegration. These advantages make micro-modular data centres a strategic choice for organisations navigating the complexities of edge computing.

SWEET SPOTS

Micro-modular data centres excel in edge scenarios, particularly in distributed, remote or harsh environments. Their rack sized enclosure allows placement in network closets, small server rooms, open offices, retail outlets or clinics where traditional data centres would be impractical.

In light industrial settings, the sealed design protects against dust and other contaminants that could damage sensitive

IT equipment. This robustness opens doors for industries like healthcare (real-time patient monitoring), retail (inventory tracking), transportation (logistics optimisation), manufacturing (automation controls), telecommunications (network nodes), media (content delivery) and financial services (secure transactions).

By bringing computing power closer to users and devices, these facilities enhance performance and reduce reliance on distant cloud resources. They are the enablers of the edge revolution, supporting the shift to more distributed networks.

LOOKING AHEAD

As organisations continue to decentralise their digital infrastructure, micro-modular data centres will play a pivotal role. They embody the future of computing. They are agile, efficient and edge focused. By mastering the edge, businesses can unlock new levels of innovation and competitiveness. ■




NASH MAHARAJ

Nash Maharaj is solution architect director EMEA at Vertiv and is an experienced professional in the data centre industry. Maharaj has dedicated the last six years to working in modular data centres, delivering innovative solutions to support strong demand.

Multiple choice

Chris Wellfair of Secure IT Environments (SITE) explains how to get the best from a fleet of micro data centres

 Micro data centres have moved from edge curiosity to routine infrastructure in many organisations. This is largely because they make it possible to place meaningful compute and storage close to users, systems and sensors when a conventional data centre room is not available or not justified.

NEXT STEPS

Inside_Networks' readers will already be comfortable with the basic design considerations, so the more useful conversation is what happens after the first few deployments. The challenge is running them at scale, in a way that remains predictable when the estate grows from a handful of sites to dozens. At that point you have a fleet, and fleets fail in ways that single deployments usually do not.

The new risks are inconsistency and drift. Alarm thresholds get adjusted locally, firmware diverges, documentation goes stale and physical access arrangements expand quietly as more people need temporary entry, while maintenance becomes irregular because each site is small enough to fall below the line of visibility until it causes trouble. None of these issues is dramatic in isolation, but in combination they create new failure modes, where teams struggle to define what 'normal' looks like.

A fleet mindset changes the objective. Instead of optimising one installation, you build a repeatable operating model that keeps many sites reliable, supportable and secure.

POINT OF REFERENCE

Fleet reliability starts with standardisation. A workable reference design needs to cover power architecture and resilience targets, cooling approach and setpoints, sensor placement, network topology including out of band access, physical access method and the commissioning tests that prove a site is genuinely ready for service. It also needs to include the practical constraints that are often missed until an incident, such as service clearances, noise expectations and the way equipment is positioned so airflow is not compromised.

The key discipline is treating the reference design as something you manage, not something you remember. If a component is substituted, a firmware baseline shifts or a monitoring agent changes, record it as an explicit update to the standard. Fleets do not tolerate silent variation, because the moment every site becomes 'slightly different', diagnosis slows down, fixes become riskier to deploy and support costs rise for reasons that are difficult to explain on a budget line.

CONTROL LOOP

In a dispersed environment, remote visibility is how you detect thermal drift, abnormal power draw, degrading cooling performance or a rising pattern of nuisance alarms before service is affected. The trap is treating monitoring as observation rather than as a system that drives decisions and action.

A helpful way to think about it is as a loop that senses conditions, supports decisions



and triggers responses. Collect consistent signals across the fleet but keep them aligned to what you can realistically act on. Rationalise alerts so they represent actionable states, then assign ownership and escalation that works in the real world.

A smaller set of alerts that people understand and trust will outperform a dashboard full of warnings that are routinely ignored. It is also worth testing the human parts of the system because notification lists, keyholder arrangements and out of hours escalation are exactly the elements that quietly decay unless they are exercised.

PHYSICAL FITNESS

In micro deployments, physical security is often framed as a compliance topic and then informally handed off as 'a building

matter'. That is a mistake. Unauthorised access, accidental interference and weak access discipline translate directly into downtime, recovery effort and risk to critical systems. The right way to view security in a micro fleet is that it protects availability as much as it protects assets.

Two practices tend to deliver the biggest return. The first is layered control. If someone can reach the cabinet, you have already lost time and options, so building entry, internal zoning and cabinet level controls should work together, with logging and routine checks that confirm those controls are still doing what you think they are doing.

The second is closing the ownership gap. If IT assumes facilities owns the access list and facilities assumes IT reviews the logs, you eventually discover that nobody

owns either. Clear accountability, routine testing and a periodic audit prevent quiet degradation.

GET REAL

Distributed sites will see imperfect conditions more often than a controlled data centre environment. Connectivity drops, local power events, temperature swings and intermittent human interference are realities of operating in production spaces, small offices and remote buildings.

Fleets need to degrade gracefully and recover predictably. This starts with defining what must continue running locally if the WAN fails, what can pause and what recovery expectations apply. It also means making the thermal envelope explicit including what 'safe' looks like, what triggers intervention and which actions come first. Planning should include likely load growth because density has a habit of increasing over time and compact installations can be sensitive to housekeeping, airflow obstructions and small changes in layout.

If you are introducing new approaches

to cooling hotspots, it pays to integrate them deliberately and ensure monitoring gives one coherent picture. Otherwise, you create blind spots and support complexity, which undermines the very predictability you are trying to achieve.

ON THE SAME FOOTING

Fleets often fail because small tasks are missed repeatedly, so filters are not cleaned, vents are obstructed, batteries age, sensors drift, temporary changes become permanent and documentation lags behind reality. Over time, these small gaps lead to avoidable incidents and longer repair cycles, which then drive reactive behaviour that makes the next incident more likely.

The fix is to treat lifecycle as part of the service. Preventative maintenance schedules, spares strategy, end of life planning and skills coverage need to exist from day one because the moment the project team leaves, the estate starts drifting. If a site includes fire detection and suppression, those systems also need defined testing, service intervals and replacement planning.

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GETTING ORGANISED

If you already have multiple micro data centres, the aim over the next 2-3 months is not to build a perfect framework. It is to introduce enough structure that the estate can scale without accumulating hidden operational

‘In micro deployments, physical security is often framed as a compliance topic and then informally handed off as “a building matter”. That is a mistake.’

debt.

Start by making the fleet visible. Build a single inventory that records each site’s location type, workload criticality, resilience target, access method and where monitoring data is sent. At the same time, assign ownership by site class rather than by geography. A ‘somebody in region X owns site Y’ model breaks as soon as people move roles or priorities shift. A model where one team owns all sites of a given class, with defined escalation and clear interfaces to local hands, is far more durable.

Next, lock down the reference design and how it evolves. Document the golden build, define how deviations are requested and approved, and agree a minimum commissioning pack that every deployment must pass before it is treated as production. From that point on, any departure from the standard should be a conscious decision with a recorded reason and a support plan, not an accident that is rediscovered during an outage.

Then turn monitoring into operational control. Consolidate telemetry where you can, reduce alert noise and write short runbooks for the handful of conditions that really matter. Agree escalation that works out of hours and make a quarterly review routine. In parallel, publish a maintenance calendar, confirm spares and set end of life dates for components.

KEEPING PACE

Micro data centres can deliver clear operational benefits, but only if the

operating model keeps pace with deployment. Once the estate becomes a fleet, consistency becomes the differentiator through consistent builds, consistent monitoring, consistent security discipline and consistent lifecycle planning. Get those right and running dozens of sites becomes routine infrastructure management – miss them and the fleet becomes a set of distributed surprises that are expensive in aggregate. ■



CHRIS WELFAIR

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

Pure Data Centres completes Europe's first successful data centre biomethane proof of concept

Pure Data Centres has achieved 100 per cent decarbonisation of natural gas consumption through Europe's first successful biomethane proof of concept (PoC). Throughout 2025, all operational natural gas consumption was matched with renewable biomethane, using independently certified gas attributes and recognised Irish and European accounting methodologies.

Pure DC utilised Irish Renewable Gas Guarantees of Origin (RGGOs) and European Biomethane Guarantees of Origin (GOs). These certificates were sourced and retired on a MWh basis to match gas consumption and met



recognised sustainability, traceability and chain of custody requirements, aligned with European renewable gas market practice, EU Emissions Trading Scheme (EU ETS), RE100 technical criteria and

broader corporate decarbonisation and climate reporting frameworks.

The PoC was consistent with Irish policy on data centres

and decarbonisation, which prioritises emissions reduction, transparency and the progressive transition away from unabated fossil fuel use, while recognising the role of renewable gases as a transitional solution where grid based deployment is constrained in the near-term.

TES Power to deliver 48MW modular power infrastructure for AI-focused data centre in Spain

TES Power has been selected to deliver 48MW of modular power infrastructure for a new AI-focused greenfield data centre in Spain.

The project will see TES Power design and manufacture 25 fully integrated 2.5MW IT power skids, supporting high density compute environments

where speed of deployment and power resilience are critical.

Each skid is a self-contained power module incorporating cast resin transformers, LV switchgear, parallel

uninterruptible power supply (UPS) systems, end of life battery autonomy, cooling via computer room air handlers

(CRAHs) and high capacity busbar interconnections. The skids are engineered to deliver uninterrupted power to critical IT loads, with automatic, flicker-free

transfer from mains supply to battery back-up and generator systems in the event of a supply disturbance, which is a requirement that is becoming increasingly non-negotiable for AI-driven data centres.



Pulsant opens high density data centre in Milton Keynes

Pulsant has completed a £10mn high density data hall in Milton Keynes. The facility is designed to support the rapid adoption of AI and advanced computing, and strengthens Pulsant's



nationwide platformEDGE framework, meeting growing demand for high performance, sovereign infrastructure beyond the constrained London market.

The 1.2MW infrastructure expansion is purpose built to handle high density computing tasks. These include intensive AI, machine learning and accelerated

workloads, which are often associated with sectors such as financial services, healthcare and biotech, IT and gaming.

With just two milliseconds of latency to London Docklands

and Slough, the site is part of Pulsant's national platform of 14 UK data centres interconnected by a 400Gb/s capable network. It opens access to 1,600+ cloud services, network providers and business partners, providing instant connectivity for global traffic routing and access to international networks.

PROJECTS & CONTRACTS IN BRIEF

Altarea and Vantage Data Centers are partnering to develop an AI and cloud data centre campus, which is expected to be one of the largest in France. The campus will be developed on land owned by Altarea close to Bordeaux. Altarea has already secured a 400MW power connection.

Nscale has signed a letter of intent with Microsoft to provide 1.35GW of AI compute capacity, setting up the West Virginia Monarch AI campus as a global flagship deployment of NVIDIA's next generation Vera Rubin graphics processing units (GPUs).

The nLighten data centre in Stuttgart will soon feed excess heat into the local heating network. nLighten is partnering with Wärmelösungen Synergiepark Stuttgart, a joint venture between Stadtwerke Stuttgart and e-con. This project marks the beginning of an expanded heating network in Synergiepark Stuttgart and is expected to go live later this year.

Start Campus and EDP have signed a strategic partnership to accelerate renewable powered data centre projects in Portugal, with potential expansion to other markets. They will combine their complementary capabilities to accelerate the delivery of competitive, sustainable computational capacity aligned with Europe's digital and decarbonisation ambitions.

Siemon

Siemon's 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.

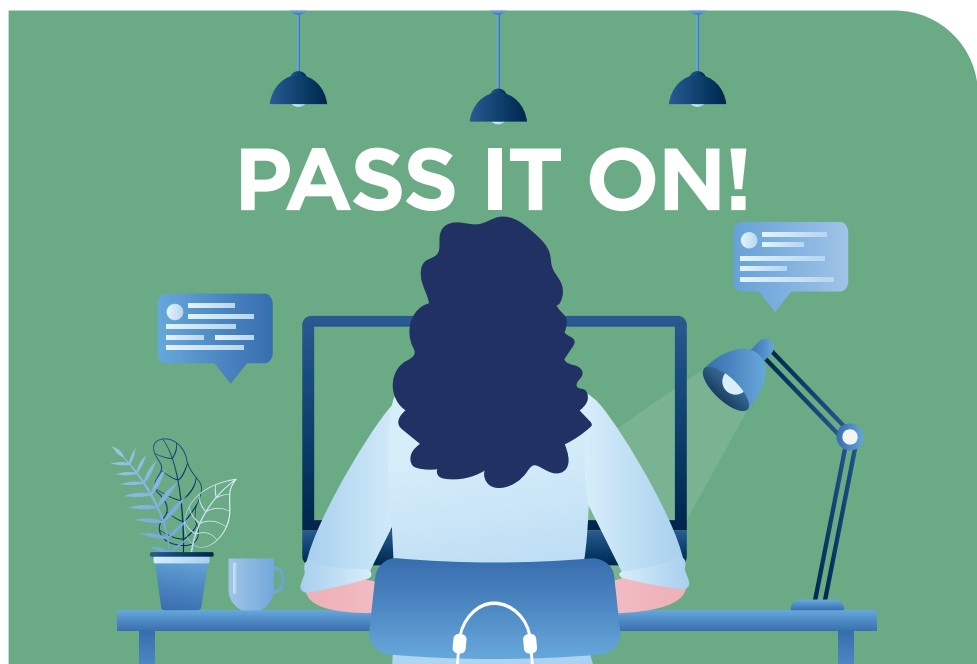
The black LightStack enclosure and connectivity range is the Base-12 format, while the grey LightStack 8 enclosure and connectivity range is the Base-8 format. Both configurations support singlemode and multimode fibre.

Siemon's innovative 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. It also 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.

To find out more [CLICK HERE](http://www.siemon.com).
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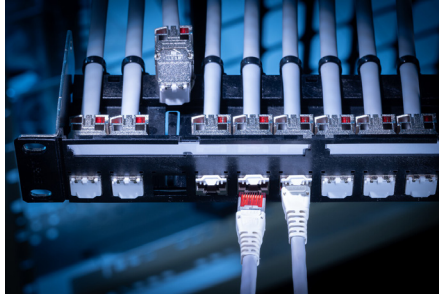
R&M

Next generation RJ-45 modules from R&M

R&M's new RJ-45 modules make LAN planning and installation easier, faster and more sustainable. The harmonised Cat.6A, Cat.6 and Cat.5e EL4.0 portfolio reduces variants to help planners, buyers and installers select the right solution more quickly while cutting stock keeping unit (SKU) complexity across purchasing and warehousing.

Designed with R&M's Easy Lock quick-mounting technology, the modules combine wire guiding, conductor connection and housing closure in a single tool-free step, reducing installation time

to as little as 1-2 minutes per module. Integrated strain relief, colour coding and an attached dust cover cap minimise loose parts, support cleaner patching and help reduce errors on-site.



Available in shielded and unshielded versions, the modules support LAN applications up to 10 Gigabit Ethernet and fit all R&M freenet outlets and patch panels. With recycled cardboard and

paper packaging, they also help reduce plastic waste. The result is a streamlined, installation ready solution for network deployments.

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

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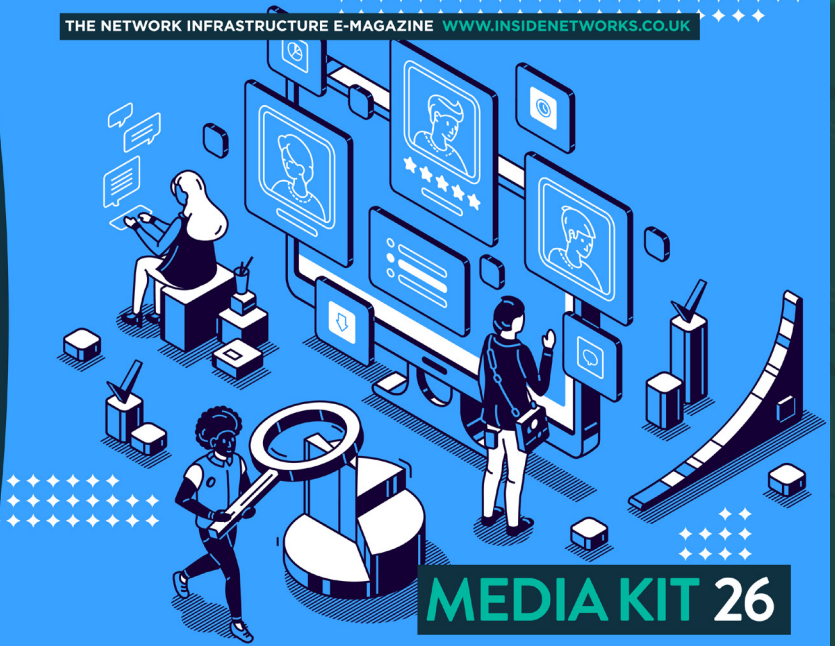


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Euro know how

Smart buildings are no longer optional, so **Chris Derham** of Alcatel Lucent Enterprise explains what the UK can learn from mainland Europe



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▶ According to figures from the State of the Climate Report, roughly 40 per cent of carbon emissions come from the construction, operation or maintenance of buildings. Of this, the heating, cooling and lighting of buildings accounts for 28 per cent of global emissions. What does this mean? For one, decarbonisation of the built environment is vital to achieving net-zero and the industry must increase momentum towards this goal.

DRIVE TIME

Smart buildings are a key driver of reduced carbon emissions. By leveraging IoT sensors, AI and automation, they optimise energy usage in real-time depending on the needs of occupants. Smart building technology has advanced in leaps and bounds over the past few years and is likely to play an important role in

achieving the UK government's emissions targets. The question is, what will it take for this technology to be implemented successfully?

Advances in AI, connectivity and data architecture are reshaping how smart buildings are designed, operated and integrated into wider urban systems. What was once a collection of loosely connected smart devices has evolved into highly coordinated, intelligent environments that continuously optimise performance in real-time.

MOVING ON UP

Today, the industry is moving decisively toward orchestration layers that aggregate and coordinate multiple subsystems through a unified digital framework. This orchestration enables buildings to optimise energy consumption, space utilisation and operational efficiency holistically

rather than in isolation. AI-driven analytics sit atop this layer, identifying patterns, predicting demand and automating responses across systems.

Crucially, this level of coordination depends on robust, purpose built connectivity. Innovative networking solutions such as Wi-Fi 7 and Private 5G are increasingly deployed to meet the specific performance, latency and security requirements of modern buildings. These technologies provide the reliable, high capacity communication layer needed to support continuous data exchange and real-time optimisation. Together, AI, orchestration platforms and advanced networks are enabling smart buildings to reach a level of digital maturity that was not previously achievable.

SHIFT WORK

Across much of the European Union (EU), smart building technologies are rapidly shifting from innovation projects to mainstream infrastructure. In France, Germany and the Nordics, legislation is incentivising or requiring the use of advanced automation, monitoring and control systems as part of broader climate and energy objectives.

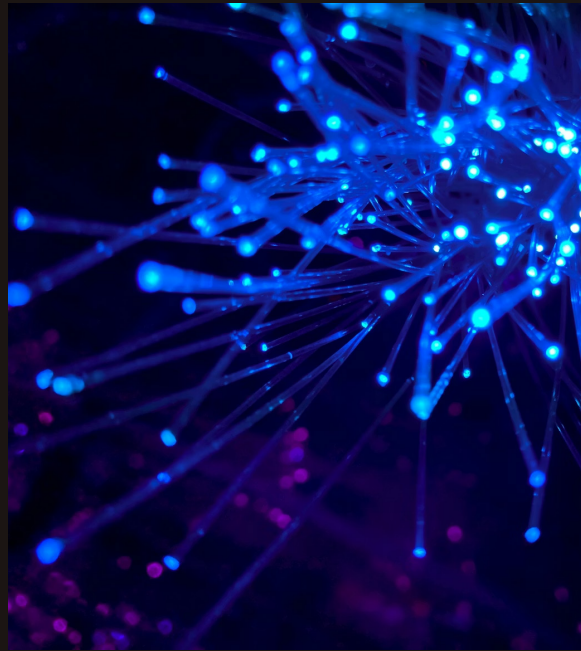
By contrast, the UK's uptake has been more uneven. While individual projects and local authorities are pushing boundaries, there is no unified national framework driving adoption at scale. This contrast is not a reflection of capability, as the UK has world class technology companies and strong expertise in digital services. It is, rather, an indication of the role that regulation plays in the development of smart buildings.

However, this gap also represents a significant opportunity. The UK can learn from Europe's experience and shape its

own approach in a way that leverages local innovation, aligns with net-zero goals and increases efficiency.

UNDER THE INFLUENCE

Certification schemes such as SmartScore and R2S are driving smart building development forward across Europe. These labels formalise expectations around digital readiness, connectivity



and flexibility, influencing both asset valuation and investment decisions. They also incentivise developers and building managers to invest in advanced smart building systems and reduce energy usage across their properties.

Developments in the UK are already engaging with these certifications. For example, the Hickman building in London was the first building to achieve SmartScore's Platinum rating,

demonstrating cutting edge innovation with the use of market leading automation to deliver world class outcomes for occupants and users.

Certification certainly provides incentives to developers and landlords. However, it primarily

‘European experience shows that well designed regulation can act as an enabler rather than a constraint, reducing uncertainty, aligning stakeholders and unlocking private capital.’



applies to non-residential buildings, which account for only 25 per cent of the total building stock by count in the UK and is not legally binding.

CATALYST FOR ADOPTION

One of the most striking features of Europe’s progress is the role regulation has played in accelerating adoption. While efficiency and sustainability have long been

commercial priorities, EU legislation has reframed them as compliance requirements, providing a clear and consistent direction of travel.

The Energy Performance of Buildings Directive (EPBD) is a defining example. By mandating that all new buildings must be zero emission by 2030 and that existing buildings be renovated to achieve zero emission status by 2050, it effectively embeds digital capability into climate

policy. Meeting these requirements at scale is not feasible without smart systems capable of monitoring, analysing and optimising performance continuously. From 2026, as the directive is transposed into national law, investment across the EU is expected to accelerate.

France’s Decree BACS, which requires non-residential buildings to deploy building automation and control systems, illustrates how regulation can drive rapid adoption of digital infrastructure. By 2027, it will apply to all buildings with an output of over 70kW, marking a significant step toward enhancing energy efficiency and sustainability.

REFERENCE POINT

European experience shows that well designed regulation can act as an enabler rather than a constraint, reducing uncertainty, aligning stakeholders and unlocking private capital. Similar frameworks in the UK could support net-zero goals while encouraging innovation in how buildings are designed and operated.

The UK already exhibits many of the components required for smart city development. London’s integrated transport systems highlight the power of data driven infrastructure at scale and other cities have developed targeted smart



initiatives aligned with local priorities. What is emerging is the need to connect these efforts into more cohesive, interoperable urban strategies.

A PATH FORWARD

One of the UK's most significant strengths lies in local innovation. Councils are already delivering smart projects tailored to their needs, such as Manchester's Triangulum initiative focused on low carbon development. These projects demonstrate what can be achieved when stakeholders are actively engaged in the creation of smarter and more sustainable cities.

The next opportunity lies in coordination. A national framework for smart buildings and smart cities could provide clarity, encourage investment and support interoperability across regions. Such a framework could set common standards and long-term objectives, while allowing local flexibility.

OPPORTUNITY KNOCKS

Smart buildings are no longer a future aspiration. By building on its technological strengths and learning from Europe's regulatory momentum, the UK has a clear opportunity to accelerate progress and shape smart cities that are efficient, resilient and fit for the decade ahead. ■



CHRIS DERHAM

Chris Derham has over 30 years' experience in the IT industry, with experience across all verticals and sectors. In his current role as business development director at Alcatel Lucent Enterprise's networks division, Derham is responsible for bringing new solutions to market, helping develop these solutions to fit many disparate customer needs, developing new partnerships, communicating with industry analysts and helping grow business in the UK and Ireland.

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