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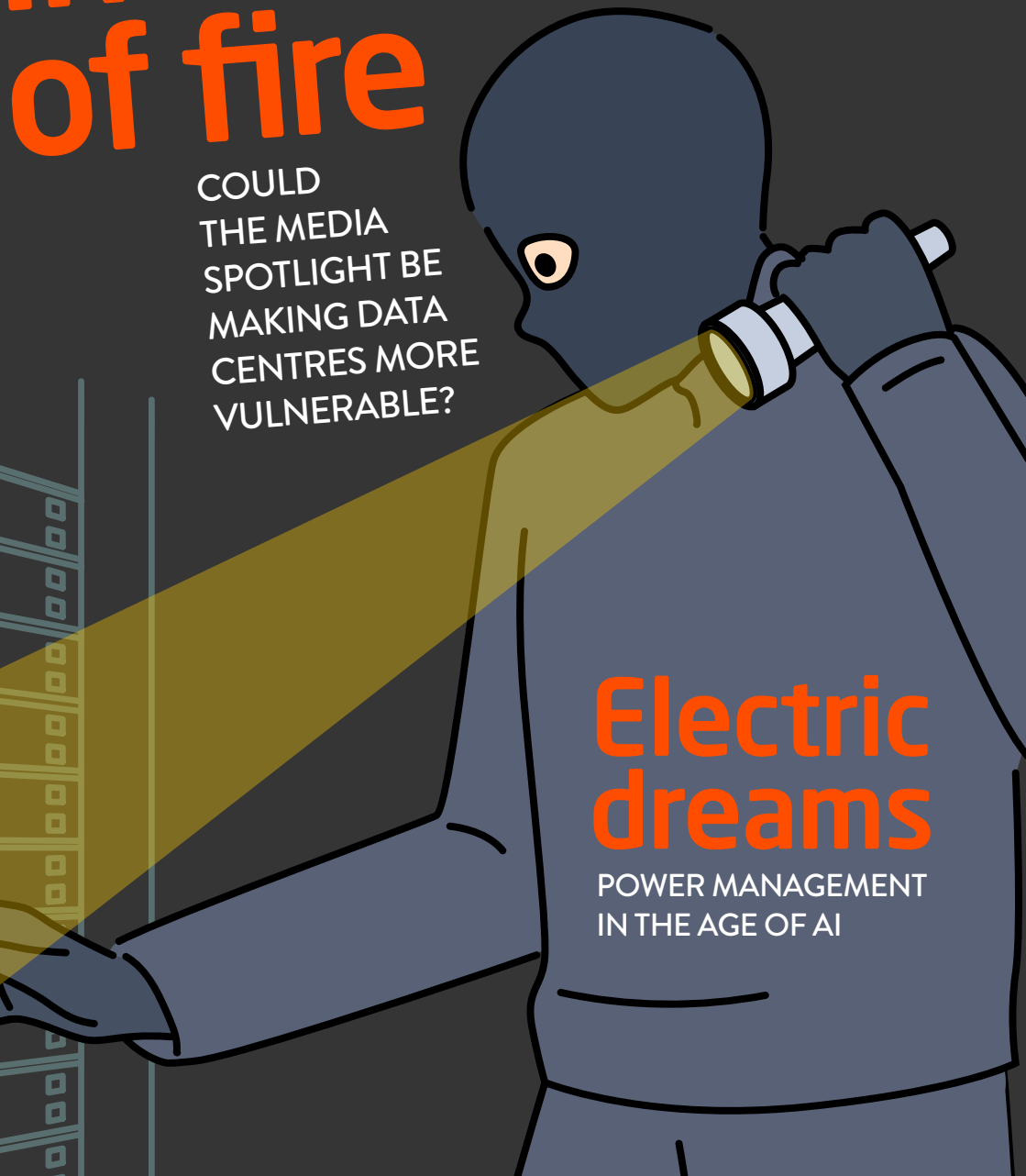


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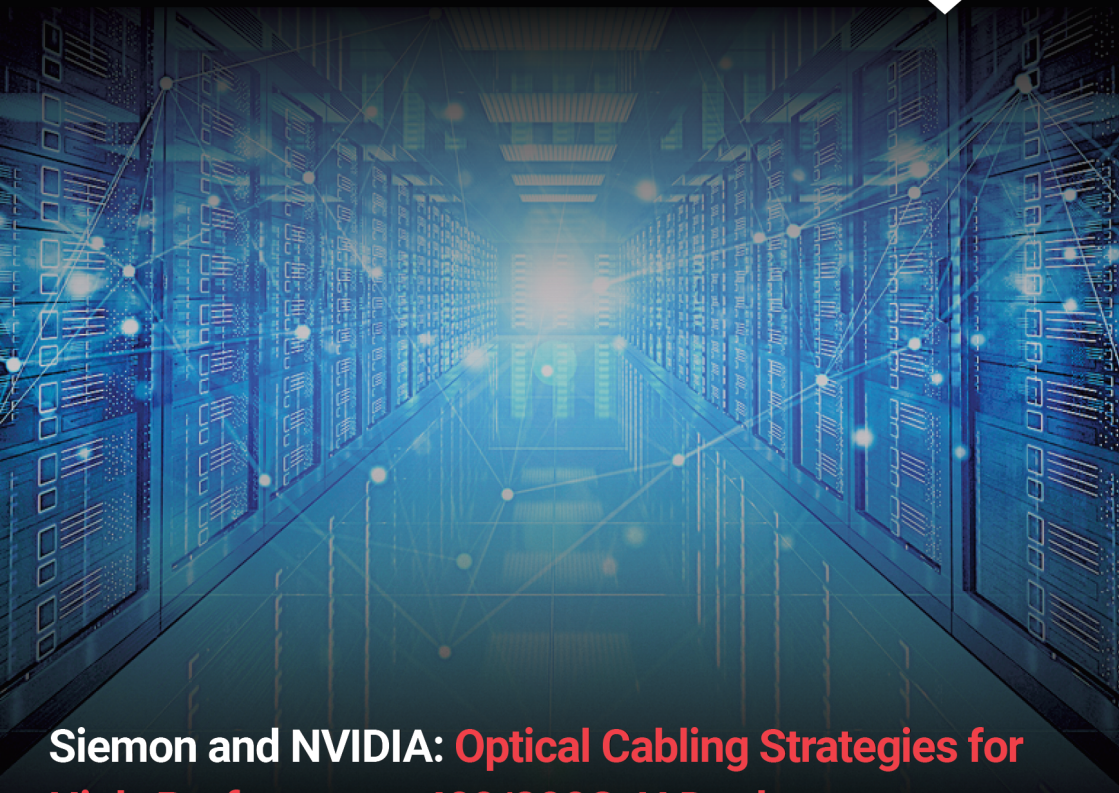
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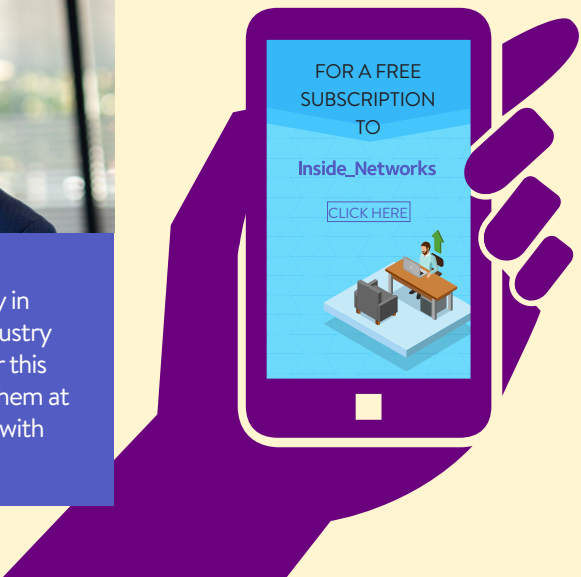
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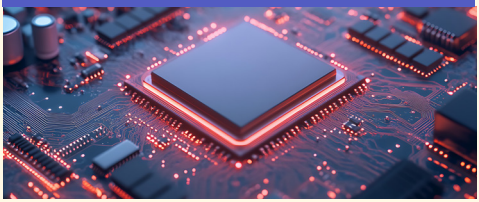


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Even though they're relied upon for every aspect of modern life, data centres are now under intense public scrutiny due to their massive energy use, water consumption and overall carbon impact. This heightened visibility makes them more vulnerable, turning them into targets for a growing range of threats.

Environmental activists increasingly see data centres as symbols of digital excess, raising the risk that climate protests could escalate from rhetoric to physical disruption. At the same time, state sponsored actors view these facilities as critical infrastructure whose compromise could ripple across economies and national security.

As such, data centres must strengthen their defences while reshaping their public image from faceless power consumers to vital, responsibly managed assets. With data centres in the media spotlight like never before, in this month's Question Time we've asked a specially selected panel of industry experts to examine the risks these facilities face and the measures that should be taken to strengthen their security.

Uptime defines a data centre's resilience and reliable, uninterrupted power is the backbone of operations, preventing costly disruptions that can damage reputations, erode customer trust and trigger major financial losses. Power stability isn't optional and we have a couple of excellent articles on the subject. Panduit's Hans Obermillacher examines the vital role of UPS and PDU connectivity in data centres and David Watkins of Virtus Data Centres looks at power management in the age of AI.

This issue also contains a special feature dedicated to pre-terminated copper and optical fibre cabling solutions. Andrew Sedman of R&M explains the key considerations when designing and installing solutions with pre-terminated cabling. Andrew's followed by Alan Keizer of AFL, who explains the networking foundations for advanced AI clusters and how pre-terminated fibre cabling systems offer significant advantages that are aligned with evolving demands.

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

Rob Shepherd
Editor

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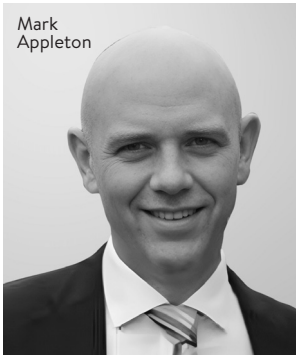
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Inefficient IT keeps SMEs from hitting climate and cost targets

The European Parliament has announced changes to the Corporate Sustainability Due Diligence Directive (CSDDD), raising the thresholds so that only companies with over 5,000 employees and €1.5bn in turnover will be directly covered. While many small to medium sized enterprises (SMEs) are formally exempt, the move is increasing indirect pressure on them to address their environmental impact.


Mark Appleton

Inefficient IT infrastructure, overprovisioned cloud services, underused servers and outdated hardware is quietly inflating energy use and operational costs, making sustainability a growing commercial and regulatory concern. Analysts estimate that inefficient digital estates can increase IT energy consumption by up to 20 per cent in a typical SME, directly affecting both carbon footprints and the bottom line. Inefficient IT also contributes to higher maintenance requirements, more frequent hardware replacement and reduced agility in adopting cloud-based solutions.

Mark Appleton, group lead vendor ecosystem development at ALSO Group, said, 'Sustainability in IT is no longer just a corporate talking point. Even when SMEs are not legally obliged to report, the expectations of partners, customers and investors are rising. Inefficient infrastructure is not only a climate issue, but also a financial issue. Businesses that ignore these pressures risk higher costs and reduced competitiveness.'

Stellium Datacenters named as OCP Experience Center

Stellium Datacenters' hyperscale data centre been designated an Open Compute Project (OCP) Experience Center – the first in the UK focusing on liquid immersion cooling. It is now open to existing and prospective customers of Stellium, Submer, ExxonMobil and their OCP partners, allowing hyperscaler, academe research, government, enterprise and AI developers to witness firsthand the immersive cooling technology in action.


Ed Bissell

'This latest endorsement by the OCP further demonstrates the high calibre of Stellium's hyperscale facility and expertise in achieving the exacting standards of design and engineering required,' said Ed Bissell, sales and marketing director at Stellium Datacenters. 'The OCP Customer Experience Center at Stellium is already in demand as more organisations look to better understand and address the myriad cooling and energy efficiency challenges resulting from the considerable power densities required by HPC and AI workloads.'

93 per cent of UK mid-market organisations are facing an IT skills shortage


Richard Moseley

Research from Node4 has found that 93 per cent of mid-market organisations are experiencing an IT skills shortage, with over half stating that it is having a significant operational impact. The findings show IT support and helpdesk roles are the most difficult to hire and retain – followed by data scientists and analysts, then DevOps and software engineers.

Nevertheless, 29 per cent of mid-market business leaders are prioritising a reduction in IT headcounts or implementing hiring freezes in response to economic pressures. If this situation goes unchecked, companies will struggle to achieve their full growth and profit potential.

'Business leaders at mid-market organisations tell us that they're facing a tough economic climate, so everything is focused on maximising their potential,' said Richard Moseley, CEO at Node4. 'Business leaders within these companies understand that skills gaps are a limiting factor across every strategic objective, from digital transformation to growth and innovation. They know they can't hire, build or automate their way forward without the right people.'

Siemens study shows energy resilience and independence are overtaking climate confidence

A study from Siemens has revealed that geopolitics is reshaping infrastructure strategy, with national energy security overtaking global climate cooperation as the primary driver of the energy transition. It reveals senior leaders believe a resilient energy supply should be the top governmental priority among infrastructure transition goals.


Matthias Rebellius

The report, based on a global survey of 1,400 senior executives and government representatives in 19 countries, highlights a shift from a multilateral vision of clean energy to one increasingly centered on sovereign resilience and regional production. With mounting pressure on public and private energy systems amid overlapping climate, geopolitical and market challenges, it finds that energy resilience is now seen as a critical enabler of the clean energy transition.

'As systems face mounting climate and energy disruptions, resilience is no longer optional – AI, technology and digitalisation are now critical to this shift. They can empower organisations and governments to manage the complexities of renewable based systems, ensure reliability and accelerate the clean energy transition smarter and more sustainably,' said Matthias Rebellius, managing board member at Siemens and CEO of smart infrastructure.

UK is losing up to £3.5bn a year as women exit tech

Between 40,000 and 60,000 women leave the tech industry each year, costing the UK economy an estimated £2-£3.5bn annually, according to The 2025 Lovelace Report. Despite women making up just 20 per cent of the UK tech workforce, the report finds a broken career framework is driving experienced talent out of the sector at an accelerating pace.

More than three-quarters of women with 11-20 years' experience have waited over three years for a promotion, and over half earn below average pay for their level. While 90 per cent of women surveyed said they want to lead, only one in four believe they can. The report estimates an annual cost of £1.4-2.2bn billion from women leaving the industry, plus a further £640mn-1.3bn from churn as women move between tech employers.


Elizabeth Anderson

Elizabeth Anderson, CEO at the Digital Poverty Alliance, commented, 'Celebrating Ada Lovelace's legacy is not just about honouring the past, it's committing to a future where every woman can thrive in a digitally connected world.'

Hundreds of misplaced devices put university data at risk

The UK's leading Russell Group universities have had 670 laptops, tablets and phones lost or stolen over the past three years, raising urgent concerns about data security across the higher education sector. The data, obtained through a freedom of information request and analysed by Parliament Street Think Tank, highlights lost and stolen devices over 11 institutions.

395 laptops, 75 tablets and 200 phones were reported lost or stolen between June 2022 and May 2025, with the total replacement bill to universities estimated at more than £300,000. Beyond the financial impact, this poses a significant data security risk.

Andy Ward, senior vice president international at Absolute Security, commented, Our research shows that 62 per cent of organisations see remote devices as the single biggest weakness in their cyber resilience posture, and 60 per cent admit remote working has complicated their ability to stay secure. Every misplaced device is more than just a financial loss, it represents a potential gateway for attackers to access sensitive student, staff and research data.'


Andy Ward

Inside_Networks announces date for 2026 Charity Golf Day in aid of Macmillan Cancer Support



Inside_Networks has once again teamed up with LMG, RSAS, Netceed, Onnec, Excel Networking Solutions and Slice Golf & Events to host the 2026 Inside_Networks Charity Golf Day, which will take place on 20th May at the Hanbury Manor PGA Championship Course in Ware, Hertfordshire.

As usual, the event will raise money for Macmillan Cancer Support and four ball teams will compete in a 'best 2 from 4' full handicap Stableford competition over 18 holes. There will also be a Beat the Pro competition and a Nearest the Pin contest. The golf will be followed by a three course dinner and prizegiving with charity raffle.

Rob Shepherd, editor of Inside_Networks, commented, 'Firmly established as one of the most popular events in the network infrastructure industry calendar, the Inside_Networks 2025 Charity Golf Day raised over £10,000 for Macmillan Cancer Support. The work that Macmillan Cancer Support carries out is invaluable and I hope that the industry will unite once again for a great day of networking and competition on one of the UK's premier golf courses.'

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

NEWS IN BRIEF

Panduit has achieved an EcoVadis sustainability rating to Silver Medal status, reinforcing the company's commitment to environmental responsibility and sustainable business practices. Panduit placed in the 94th percentile amongst more than 150,000 companies worldwide that have been rated by EcoVadis.

AFL has been recognised with the Economic Champion Award by OneSpartanburg at its Annual Celebration: A Season of Impact. The award recognises AFL's longstanding partnership with Spartanburg County, its investment in workforce development through internship programs, job creation, a recent $155mn facility investment and ongoing commitment to the community.

The UK government has announced a new Memorandum of Understanding with Sweden to strengthen cooperation in research and innovation over the next five years, with future telecommunications named as one of its key priorities. The agreement signifies a shared intent to deepen collaboration in areas such as AI, 6G development and network security.

A study by Juniper Research has found that over-the-top (OTT) business messaging traffic will grow from 390 billion messages in 2025 to more than 560 billion by 2027.



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Being smart with multi-cl
an era of rising costs

Hi Rob



Businesses have always been under pressure to do more with less, but the dual impact of AI and inflation is starting to strain the abilities of even the most financially-savvy chief information officers (CIOs). A recent study by Akamai found that over two-thirds of IT staff in the UK, France and Germany may be forced to make cuts because of rising AI and inflationary costs, specifically in the areas of cybersecurity or staffing.

There must be a better way to handle this pressure. According to a government survey, there are over 50 ransomware attacks on British businesses alone every single day. And many organisations – specifically those involved in critical national infrastructure (CNI) – are now forbidden by law from paying ransomware demands.

It's a bad time to cut spending on IT security or staffing. AI is maturing fast, but many of the benefits of AI work best when overseen by a human. AI is not a matter of 'lift and shift'. It needs an appreciation of complexity including integration, data processing regulations, ethics and technological supply chain to name but a few. Unhelpfully, this still leaves us needing to reduce costs.

There are ways of doing AI in a more cost effective fashion. Inference is sensitive to latency, because it's user-facing. Model training isn't, and it can be done anywhere. AI is power intensive, but countries or regions with more sustainable ways of generating power tend to be more cost effective. For example, Canada is renowned for its low cost energy, partially due to the abundance of hydroelectric power plants.

At the same time, organisations that use more efficient and sustainable methods of power and cooling will also have lower costs. Water cooling is more efficient and therefore cheaper than air cooling, for example, and with AI's higher rate of power consumption, increasing numbers of data centre businesses will be considering a long-term shift to this technology.

We can be pragmatic about the AI infrastructure we use. If an organisation is running training over a weekend, while a

oud AI is crucial in



H100 graphics processing unit (GPU) might finish at 11.00pm on Saturday night and a V100 at 3.00pm on Sunday, given that the humans arrive back in the office at 9.00am on Monday morning, using a cheaper alternative is inherently sensible.

Organisations should also accelerate their multi-cloud journeys. Around half of IT staff believe that running the right workload on the right cloud can improve cost effectiveness. We've seen organisations cut cloud costs by 62 per cent by switching to a new provider without compromising on power or security – although this makes interoperability crucial.

In the short-term, cost management, without compromising on functions such as staffing or security, will be more important than ever. However, innovating in the face of adversity has always been a strength, and AI is a transformational technology which will have an enormously positive impact on innovation, productivity and ability to serve customers better.

Matt Tebay
OVHcloud

Editor's comment

Today's AI-driven environment is certainly testing the tactical abilities of even the most strategic CIOs as they reshape how they allocate budgets, manage operations and deliver value. Ultimately, they need to balance innovation with financial prudence.

As Matt makes clear, the real challenge is in driving efficiency while safeguarding what matters most. Success will come from bold innovation and finding smarter, leaner ways to operate and thrive even in the toughest conditions. Not every workload belongs in the same place and choosing the right cloud set-up can make a tangible difference to both performance and cost. Multi-cloud delivers agility, resilience and cost effectiveness, allowing users to optimise expenditure with the best possible services.

We need to talk about HF

Hi Rob



Data centres often hold the fluorinated gas (F-gas) HFC-227ea, traded under the name FM-200, as an emergency measure to stop fires in data halls and technical spaces without harming electrical equipment. Robust fire prevention helps avoid devastating human, operational, financial and environmental consequences, but there's a problem with this particular gas. If released, it has an immense global warming potential (GWP).

Data centres are not the only users of HFC-227ea but it has been an attractive option in technical environments, as it avoids damage to hardware when used. It is sometimes even described as 'environmentally friendly' because of zero ozone depletion impacts.

Looking at the scale of the issue from the top down, the UK's HFC emissions from fire protection systems have been estimated at around 250,000 tCO2e in 2022 – only about 0.06 per cent of the UK total. However, this is likely to cause under-appreciation of the problem and mask the opportunity for data centres to make a positive change by choosing an alternative solution.

1kg of HFC-227ea has the GWP equivalent to 3220kg of CO2e over a 100-year period, which is the usual way of standardising the impacts of various gases. However, the method of averaging impacts over 100 years has been criticised, since the warming impact of gases like methane and HFCs is concentrated in the first couple of decades.

HFC-227ea doesn't hang about in the atmosphere for longer than about 36 years, during which its atmospheric heating impact occurs. Looking at an alternative 20-year time horizon, each kilo of HFC-227ea has the increased GWP of 5310kg of CO2 – or over 1000 tonnes of CO2e for each 200kg cylinder.

Unlike slower F-gas leaks from cooling systems, a bank of cylinders can be discharged in minutes. Gas can be released because of the system being triggered correctly in response to smoke, or accidentally, for example, from hardware failures. For perspective, the impact of a 200kg cylinder release is higher than the annual electricity related emissions for some smaller data centres and could easily outweigh the annual progress operators achieve in energy efficiency.

Framing this positively, preventing F-gas losses in a direct (Scope 1) emissions profile reduces global warming effects more quickly than avoiding CO2. Direct emissions are worthy of our focused attention and they are one of the elements operators can most clearly control.

Pulsant is committed to phasing out

C-227ea



HFC-227ea by 2030 and this year aims to have reduced holdings by 50 per cent by replacing gas cylinders with near zero GWP alternatives. Some engineering has been required to allow for a greater physical footprint of alternatives and it's not clear how this has avoided emissions since incidents are – fortunately – far from routine. However, from a purely selfish perspective, since alternative gases are not subject to the same level of regulation that demands measures around inspection and test frequency, contractor certifications and documentation, it simplifies the compliance work.

The swaps are also an excellent way to anticipate longer-term supply risk. Measures are in place to phase down the use of HFCs in the US, Great Britain and EU, as well as many other countries through the Kigali Agreement, and while actions are primarily focussed on F-gas use in cooling and refrigeration, there is risk that HFC-227ea price and availability will reflect increasing limits on its use. Organisations looking to refill the gas following a discharge may find themselves in difficulty and the alternative gases are not an instantaneous replacement.

Data centre operators rightly focus on efficiency and energy related initiatives, but we are not just talking about the potential harm of our fire suppression systems. Some operators may not use HFC-227ea at all already – and that's great. But there is a lack of acknowledgement regarding this issue, particularly amongst facilities that have not yet directed resources at examining their emissions footprint in depth.

It's time to broaden the conversation. Let's improve awareness, share best practices and collaborate on phasing out high GWP fire suppression gases. Addressing this 'silent' emissions source could significantly enhance the industry's sustainability performance – and it's well within our control.

Helen Munro
Pulsant

Editor's comment

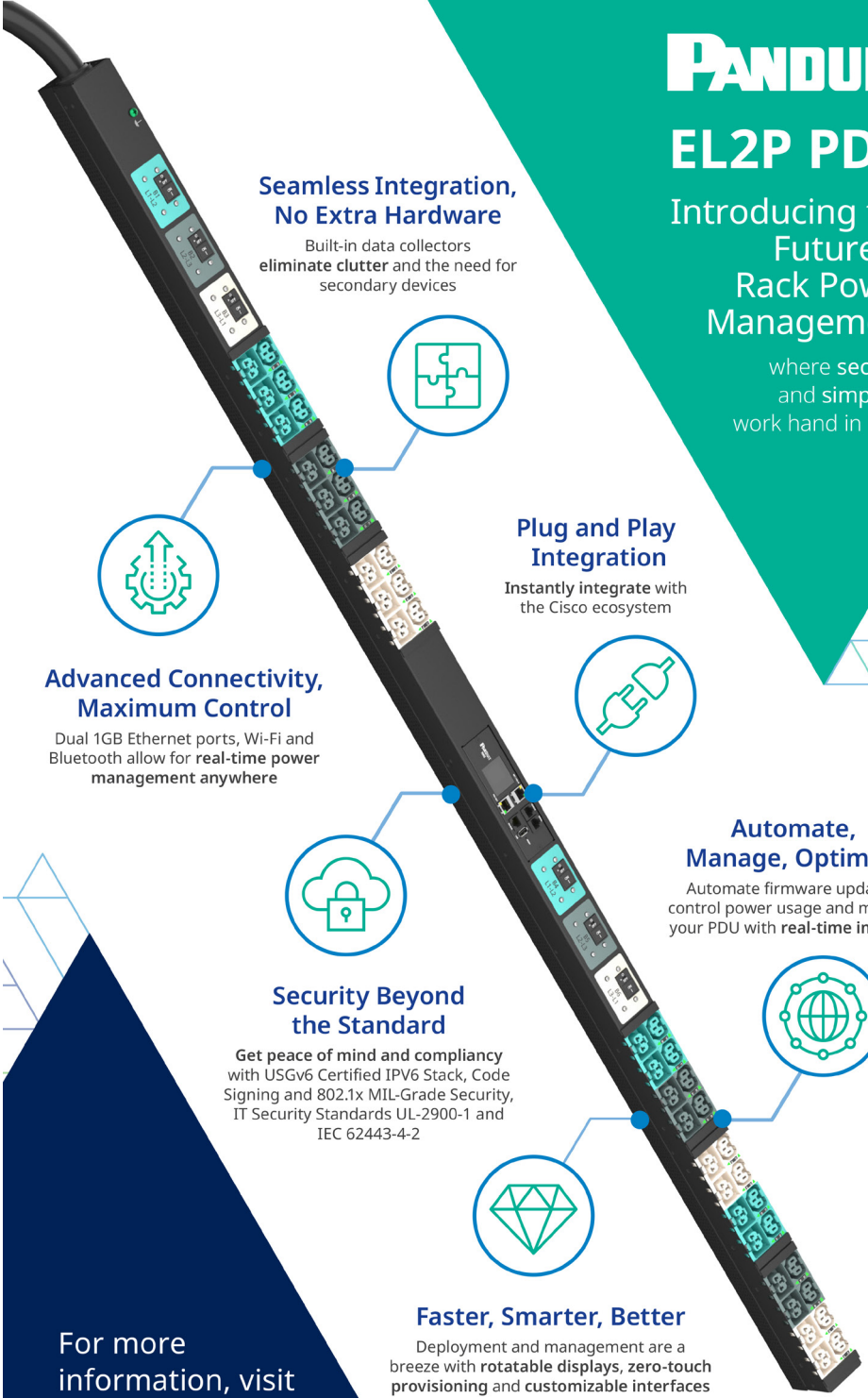
HFC-227ea in data centres clearly poses a hidden but significant sustainability challenge. Greater knowledge about its environmental impact and encouraging open conversations among operators, regulators and technology providers is clearly needed. As Helen makes clear, by addressing these emissions collaboratively, the data centre sector can significantly enhance its sustainability performance while aligning with global climate goals.

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Above the radar

The AI era has thrust data centres into the media spotlight like never before. Inside_Networks has assembled a panel of industry experts to examine whether this level of exposure puts them at greater risk from those with malicious intent and the additional measures that should be taken to strengthen security

Data centres have long been the silent engines of the digital age – out of sight and out of mind. However, that's all changed and with the mainstream media spotlight now fixed on their enormous energy demands, water consumption and carbon footprints, data centres are headline material. And visibility brings vulnerability.

As awareness grows, so too does the range of potential threats. Environmental activists increasingly view data centres as representing resource consumption on a staggering scale. What happens if climate protest moves beyond slogans and rallies to physical disruption?

Meanwhile, state sponsored actors see data centres not simply as infrastructure, but as critical infrastructure that, if disrupted, could affect economies and national security alike. In a world where national rivalries dominate, physical sabotage cannot be discounted but the risk also spans supply chain manipulation, insider threats, coordinated misinformation campaigns designed to erode public trust and subtle attacks on utilities powering these facilities.

In short, the modern data centre stands at the intersection of environmental controversy, digital dependency and geopolitical tension. Inside_Networks has assembled a panel of experts to offer their views on how to protect data centres, while ensuring that they are not simply seen as faceless consumers of power.



SABINE HEINE BICKLE

HEAD OF RISK & ASSURANCE AT PULSANT

As data centres become more visible in the media, concerns around their security have understandably increased. However, this visibility hasn't necessarily brought greater risk from sophisticated bad actors like cybercriminals or state sponsored hackers.

These groups have long been aware of data centres and tend to target them via digital rather than physical means. For those seeking to steal data or demand ransoms, it's far easier to exploit vulnerabilities online than to physically enter a data centre, which is designed, built and operated with multiple layers of security and offers very little publicly available information about where specific data is stored.



That said, growing public awareness can attract threats from activism driven individuals or groups. Motivated by concerns about environmental impact, power or water usage, or corporate influence, these actors may be less interested in data theft and more likely to carry out acts of vandalism, protest or disruption. In extreme cases, this includes acts of sabotage like disrupting power or network feeds. This is something increasingly on the radar, especially given international examples of similar activity.

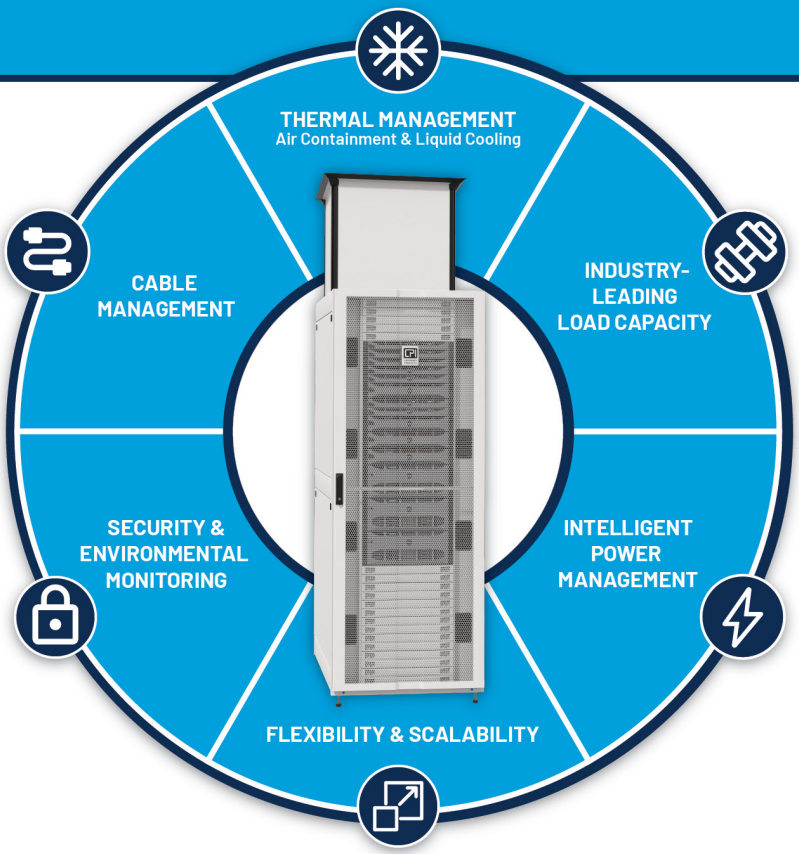
While the resilient design of data centre infrastructure makes it difficult for a single act of disruption to cause significant outages, physical vulnerabilities, particularly to external components, should not be overlooked. Some facilities may need to reassess their perimeters and access points to ensure increased protection against sabotage.

However, hardening physical security is only one part of the response and proactive community engagement is equally important. Research has shown that public support for data centres increases when people understand their role in enabling everyday digital experiences and their contributions to local employment.

Misconceptions should also be addressed through better industry-wide communication. For example, there has been a great deal of reporting about the sector's high water usage, yet recent techUK research has found that, in a UK context, this perception is, in fact, inflated.

While increased visibility doesn't drastically change the risk profile from traditional cyber threats, it may raise the likelihood of activist-led disruption. The best response is one that strengthens physical safeguards where needed and invests in local engagement to build understanding and trust.

'RESEARCH HAS SHOWN THAT PUBLIC SUPPORT FOR DATA CENTRES INCREASES WHEN PEOPLE UNDERSTAND THEIR ROLE IN ENABLING EVERYDAY DIGITAL EXPERIENCES AND THEIR CONTRIBUTIONS TO LOCAL EMPLOYMENT.'



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As data centres become more prominent in public discussion, their exposure inevitably raises their risk profile. But the real issue is not simply visibility, it's mindset.

These facilities are no longer just technical sites housing racks of IT equipment, they're critical national infrastructure and without them society would face a regression to what might fairly be described as the digital dark ages. From undersea cables linking continents to hyperscale campuses driving AI and commerce, the stakes are existential.



The priority must be people, because while skills shortages are real, what matters just as much is recruiting and developing individuals who truly grasp the importance of what they are protecting. Security awareness should be embedded at the earliest stage of onboarding and then reinforced through continuous training and leadership development. This extends beyond engineers and dedicated security teams to cover operations, facilities and executive leaders, so that responsibility is shared across the organisation rather than isolated in silos.

Culture then becomes the multiplier, because only when vigilance is woven into everyday decision making can risks be identified and acted upon before they escalate. This requires psychological safety to raise concerns, collaboration between teams who might otherwise operate separately, and an environment where frontline staff are empowered to recognise anomalies and escalate them. These human interventions are often more effective than automated systems alone.

Finally, the underlying processes must evolve, with organisations moving away from reactive measures and minimum compliance and towards proactive disciplines such as physical and cyber threat modelling, rigorous access controls that are regularly reviewed, and scenario planning that factors in not only technical issues but also geopolitical and environmental risks. True resilience rests on operational discipline and continuous improvement, ensuring that lessons are applied and processes adapted as the landscape changes.

It is not visibility that presents the greatest danger, but complacency. The only way to counter this is with empowered people, resilient cultures and robust processes that together provide the level of protection that society now depends upon.

'IT IS NOT VISIBILITY THAT PRESENTS THE GREATEST DANGER, BUT COMPLACENCY. THE ONLY WAY TO COUNTER THIS IS WITH EMPOWERED PEOPLE, RESILIENT CULTURES AND ROBUST PROCESSES THAT TOGETHER PROVIDE THE LEVEL OF PROTECTION THAT SOCIETY NOW DEPENDS UPON.'

STEPHEN BOWES-PHIPPS

VICE PRESIDENT EMEA DATA CENTRES AND CLOUD AT STATE STREET

'Security by obscurity' used to be the most common first line of defence for data centres. If you didn't know it existed, then why would you consider attacking it?

I have noticed a trend over the last 5-10 years of providers increasingly advertising their presence outside the building and promoting their brand. This comes with positives and negatives – especially with regards to security.



Data centre security is regularly referred to in terms of layers of an onion. Typically, you would have seven layers, from the perimeter of the building to the server cabinet in the white space. It's often stated that the weakest part of any security system is the significant dependence on the human element. We're not just talking about passwords and poor email risk awareness, the risks around compromising data centres are both real and difficult to eliminate completely.

If you've been to a data centre recently, you'll have been asked to bring a form of government issued identification with you. The person at the security desk will also have had background checks to ensure they have no ties to past criminal activity. What you do next is not as easy to control.

Technology can help but does not necessarily prevent security breaches – it has more use in identifying how and who was involved in the breach and is a historical device. If you wanted to cause damage, the truth is you probably could, but measures such as accompanying people into any secure space, keeping cabinets secure with robust key management and ensuring security staff have the right focus on high risk areas of critical equipment can help.

In addition, having excellent ties with other local businesses to track threats to specific locations can help you to profile certain risks to the facility prior to occurrence. Has there been criminal damage nearby? Focusing on camera coverage and weak areas such as overhanging tree branches, for example, can mitigate the chances of an unwanted and potentially malicious incursion.

It is also wise to invite a third-party in to undertake a threat and vulnerability risk assessment (TVRA) once a year and know your weaknesses before someone else figures them out!

'I HAVE NOTICED A TREND OVER THE LAST 5-10 YEARS OF PROVIDERS INCREASINGLY ADVERTISING THEIR PRESENCE OUTSIDE THE BUILDING AND PROMOTING THEIR BRAND. THIS COMES WITH POSITIVES AND NEGATIVES – ESPECIALLY WITH REGARDS TO SECURITY.'

PAUL RICHARDSON

OPERATIONS MANAGER AT STELLIUM DATACENTERS



As critical national infrastructure, modern data centres are designed, built and managed as high security, risk averse entities. This is evidenced by their ongoing compliance with recognised industry accreditations, awarded following rigorous independent annual auditing. For customers of these advanced facilities, any increased media exposure and public awareness about the very existence of data centres should not affect this status quo.

These facilities already have comprehensive physical security measures in place and operate granular access control with strict protocols in order to mitigate the risk of physical attack on customer assets. However, there is no room for complacency. The optimal combination of physical, technical and human security must be continuously in place, underpinned by a rigorous regime of checks and maintenance on physical infrastructure and digital security systems.

However, with growing data centre awareness, location may prove a growing challenge for older legacy facilities and, perhaps, even so-called edge data centres – for example, those that were formerly offices and warehouses. Their close physical proximity and exposure to large numbers of people in towns and cities, plus other risk factors such as flight paths, could put them at increased risk of physical ingress or a planned terror attack.

In all cases, a multi-layered physical infrastructure should be a prerequisite, encompassing bullet and bombproof building construction, a permanently manned security gatehouse, prison grade perimeter fencing and anti-ram bollards. Additionally, comprehensive surveillance systems using a combination of PTZ, bullet CCTV, infrared night vision CCTV, 360° CCTV with automatic number plate recognition (ANPR) technology and motion sensors should be considered. Facial recognition can be used at one location or throughout, while door and window intruder alarms using HID or infrared sensors is another requirement.

Furthermore, strict control and access management protocols for all personnel including staff and visitors will mandate a valid form of identification with anything less than government issued ID usually being unacceptable. It is vital the security department is fully trained and holds a Security Industry Authority (SIA) license. Ensuring the lowest level of connectivity to the core network will also mitigate risk of attack to its security systems – with most software applications operating as standalone.

> ‘THE OPTIMAL COMBINATION OF PHYSICAL, TECHNICAL AND HUMAN SECURITY MUST BE CONTINUOUSLY IN PLACE, UNDERPINNED BY A RIGOROUS REGIME OF CHECKS AND MAINTENANCE ON PHYSICAL INFRASTRUCTURE AND DIGITAL SECURITY SYSTEMS.’

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ROB KELLY
SMART TECHNOLOGY DIRECTOR AT SUDLOWS

The global data centre market continues to develop at a rapid pace, with some predicting annual growth predictions of up to 20 per cent by 2030. Fuelled by the need to support various AI applications, digital transformations and emerging technologies, the widespread presence of data centres has never been more visible and their profile as critical infrastructure environments is widely known.



Data centres can be particularly vulnerable to attack, from a cyber level such as DDoS campaigns, ransomware attacks and potential state sponsored intrusions, though to physical risks such as theft, sabotage or malicious damage. A successful attack could have a significant impact across the affected industries, or even society as a whole, dependant on the nature of the services.

The ability of potential bad actors are such that traditional security practices are no longer sufficient and must evolve to match the new threat levels. Physical defences must be both layered and hardened protecting against human, vehicular and even airborne attacks.

Moving beyond the perimeter fence, video surveillance with advanced analytics, layered access control with biometrics and a 24/7 on-site security presence are critical alongside anti-vehicle solutions. In addition, a robust visitor management strategy will qualify any persons coming on-site. These are essential parts of the security toolkit for data centres. With the growing prevalence of drone technology, some consideration may even be given to drone defence solutions.

From a cyber point of view, network segmentation is a must, along with continual monitoring and access to the latest threat intelligence and rapid incident response. AI driven anomaly detection supports early warning of potential issues in the network and ensures strong linkage with physical security solutions to ensure that no attack surface exists between the cyber and physical components of any security system.

Rising mainstream visibility along with critical use cases for data centres is most certainly increasing both the risk and potential impact of an attack. However, implementing a layered approach to data centre security, including tightly woven physical and cyber solutions along with robust operational processes, can help significantly reduce the risk.

> ‘RISING MAINSTREAM VISIBILITY ALONG WITH CRITICAL USE CASES FOR DATA CENTRES IS MOST CERTAINLY INCREASING BOTH THE RISK AND POTENTIAL IMPACT OF AN ATTACK.’

BRIAN O'HARE
SERVICE DIRECTOR AT BCS

Data centres have shifted from being nondescript grey walls on industrial estates to highly visible parts of national infrastructure. 10 years ago, few outside the industry even knew they existed but now the landscape has changed and they are front page news.



In many ways they are a victim of their own success. Their size, power requirements and role in supporting AI and cloud services mean they are increasingly recognised as critical to everyday life. With that visibility, however, comes exposure – and risk.

Activist groups have already protested at construction sites, while operators must now consider the possibility of more serious attempts at disruption or intrusion. Equally, cyber risks are growing as building systems, power management and IT networks become ever more interconnected.

Traditional measures such as perimeter fencing, CCTV, basic access controls and antivirus software are no longer enough. A layered, integrated approach is now essential.

Physically, this means secure perimeters, carefully managed access and surveillance that is monitored rather than just recorded. Digitally, it requires continuous network monitoring, intrusion detection and a proactive approach to patching and system updates. Crucially, operators must also take supply chain risk seriously. A contractor, a vendor or even third-party system integration can become a back door into the facility.

Insider risk, whether through malice or simple error, remains one of the greatest vulnerabilities. Building a strong security culture is just as important as installing new systems.

The industry must accept this new visibility and design resilience around it by blending physical, digital and human factors into a unified approach. Operators must change to build closer partnerships with external bodies, local authorities, law enforcement and government agencies who all have a key role to play in keeping these facilities safe. Those who do will be best placed to secure both their assets and the trust that society places in them.

'ACTIVIST GROUPS HAVE ALREADY PROTESTED AT CONSTRUCTION SITES, WHILE OPERATORS MUST NOW CONSIDER THE POSSIBILITY OF MORE SERIOUS ATTEMPTS AT DISRUPTION OR INTRUSION.'

DCA and Clear Decisions form strategic partnership to deliver live compliance and horizon scanning for UK data centres



The Data Centre Alliance (DCA) and Clear Decisions have formed a strategic partnership to provide DCA members and the wider UK data centre sector with automated compliance monitoring and horizon scanning services.

The collaboration will see the DCA's Data Centre Legislation Horizon Scan developed into a live compliance and foresight feed, giving members an industry first digital tool to track and respond to regulatory and policy developments. The pilot will initially track high priority areas such as grid connection reforms, lithium-ion battery safety, NIS cybersecurity requirements, AI policy and carbon and water regulations impacting data centre planning and operations.

Steve Hone, CEO at the DCA, said, 'This partnership with Clear Decisions is designed to deliver real value to our members and the wider UK data centre community. By transforming our horizon scanning into a live, automated service, we are equipping operators, suppliers and policy stakeholders with a practical tool to navigate fast moving regulatory and compliance challenges.'

Allied Telesis introduces new global partner program



Allied Telesis has launched its new global partner program – the Allied Telesis Partner Network (APN). Built with direct input from partners, APN introduces a clear tier framework with predictable benefits, an upgraded partner portal for faster onboarding and an enablement model aligned to measurable outcomes.

As part of the rollout, Allied Telesis is hosting regional partner briefings and events across APAC, EMEA and the Americas to update existing partners on the program changes and to welcome qualified partners in markets where no formal program was previously available. The program is backed by a dedicated global partnerships team working alongside sales and technical experts. This team is focused on helping partners win more opportunities and create long-term customer value.

'APN was built with partners, for partners,' said Chris Elliott, vice president partnerships and alliances at Allied Telesis. 'We focused on clarity, predictability and speed, so our ecosystem can deliver value to customers faster. This is a practical program that rewards the work our partners do every day.'

CMW appointed as HellermannTyton official distributor



Cable Management Warehouse (CMW) has been named official UK distributor for HellermannTyton, marking a significant milestone for both companies. This new partnership enhances CMW's product portfolio and strengthens its position as a key supplier in the data centre sector.

As part of the agreement, CMW becomes the only UK distributor to stock HellermannTyton's GigaDuct optical fibre routing system. Designed for data centre environments, GigaDuct offers a robust and scalable solution for organising and protecting fibre cables. The system helps prevent cable congestion, reduces stress on fibres and supports efficient management, ensuring reliable performance and streamlined installation across complex network infrastructures.

Dave Dann, GigaDuct product specialist at CMW, said, 'We're proud to strengthen our partnership with HellermannTyton as an official distributor, while also currently being the only distributor in the UK to stock the GigaDuct fibre raceway system. This enables us to offer our customers the very best in cable management and fibre infrastructure solutions, all from a single trusted source. CMW can deliver fibre infrastructure solutions that meet the highest standards of durability, airflow management and future network scalability.'

CHANNEL UPDATE IN BRIEF

Gamma Communications and Crexendo have formed a strategic cooperation agreement to accelerate international growth for service providers around the world. In addition, both companies have selected Oracle Cloud Infrastructure (OCI) to power their platforms.

Vertiv has signed a distribution agreement with PNY Technologies. The companies will work together to provide comprehensive power and cooling infrastructure solutions based on Vertiv's validated reference designs for the latest AI platforms, supporting system integrators and resellers in accelerating AI adoption across the EMEA region.

Verkada has announced a strategic partnership with Simac. Through this partnership, Verkada's integrated platform will be added to Simac's technology portfolio, expanding access to modern, data driven security solutions across the region.

Gigamon has made several key executive leadership changes including the appointment of Gareth Maclachlan as chief operating officer, the promotion of Ram Bhide to chief development officer, and the expanded role of Chaim Mazal as chief AI and security officer.

Zero Networks has entered into a strategic partnership with Exclusive Networks to significantly expand its channel presence and reach across Europe.

Ready for anything

Andrew Sedman of R&M explains the key considerations when designing and installing solutions with pre-terminated cabling

Pre-terminated solutions eliminate on-site splicing, reducing installation time, cost and complexity. Combined with meticulous installation and testing, they can rapidly deliver reliable performance. However, careful selection of connector types, protection and adherence to procedure are key, while inspection and certification testing ensure solutions meet design and warranty requirements.

THE RIGHT SOLUTION

It's vital that a pre-terminated solution perfectly suits its installation environment – from controlled indoor spaces to versatile backbone and campus links or extreme outdoor/industrial conditions. Solutions should also meet requirements related to application (bandwidth and distance in particular), ease of handling and quality assurance.

Data centres, enterprise LANs and commercial buildings require solutions designed for environments in which space efficiency and high density packing are essential. Performance and space utilisation are critical and ease of handling is key to ensuring reliable connections.

SUPPORT STRUCTURE

Backbone, trunk and campus cabling solutions need to support singlemode and multimode optical fibre and ensure flexibility to accommodate a wide range of network designs. Cabling should support medium density packing, enabling versatile indoor and outdoor installations, while offering the durability required for longer inter-building links.

For harsh outdoor and industrial environments such as fibre to the antenna (FTTA) deployments, tunnels or smart city projects, solutions need to endure extreme mechanical and thermal stress. A tensile strength of up to 999N, IP67 waterproof protection and reliable

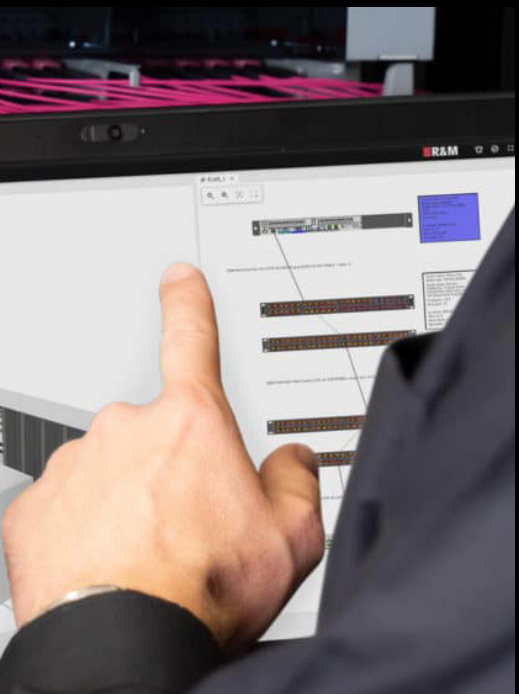


performance between –25°C and +70°C is recommended. Such features should guarantee long-lasting connectivity in exposed conditions where cables are subjected to pulling forces, weather variations and other environmental challenges.

SOLID VERSUS STRANDED

Most manufacturers emphasise the greater distances that solid core pre-terminated solutions can cover, as there's an assumption that attenuation performance in stranded cables is higher than in than in solid core cable. However, this is a common misconception, mainly fuelled by standards indicating that the attenuation of stranded cable used in patch cords is 1.2-1.5 times higher.

It is important to point out that the higher attenuation is not caused by the stranded cabling itself. Instead, it is because these are AWG24 or AWG26 cables, instead of AWG23 like the installation cable. AWG23 is the thickest of these three. Stranded and solid cable of equal diameter (AWG) should have approximately the same attenuation values.



DON'T GO THERE

It is widely acknowledged that solid core cable shouldn't be moved or manoeuvred once in place. Uncoiling, terminating and recoiling solid core cable, followed by potential rough handling during on-site installation, diminishes performance values of the links. Solid core pre-terminated cabling is simply not designed to be flexible, after all, it is called a fixed link. Using flexible copper cores ensures consistent link performance between factory termination and installed link testing, thanks to the cable's inherent flexibility.

The reason manufacturers use solid core cables, beyond their length advantage, is cable termination. Many manufacturers use rigid IDC posts in their jacks for the specific use with solid core cable. This makes them less effective and somewhat unstable for stranded copper cores, whereas using flexible IDC posts in the jack will enable secure termination of the stranded cores. The biggest issue with solid core cable in IDCs is the stress that arises at the point of termination when the link is being moved or manoeuvred.

When specifying a solution, it's important to avoid systems in which the cables are not secured to the back of the jack. This will almost certainly cause micro-cracks in the copper cores at or near the point of termination when it is moved.

Micro cracks at the point of IDC termination can lead to delayed

‘All manufacturers should be able to provide test results for each pre-terminated link. However, these are no more than a guarantee of the quality of workmanship within a production facility.’

performance degradation. As a result, initial post installation results may turn out to be effective false positives that time will expose. If the cable can be secured to the back of the jack, rough handling during cable installation won’t significantly diminish the link’s overall performance.

TESTING TIMES

All manufacturers should be able to provide test results for each pre-terminated link. However, these are no more than a guarantee of the quality of workmanship within a production facility.

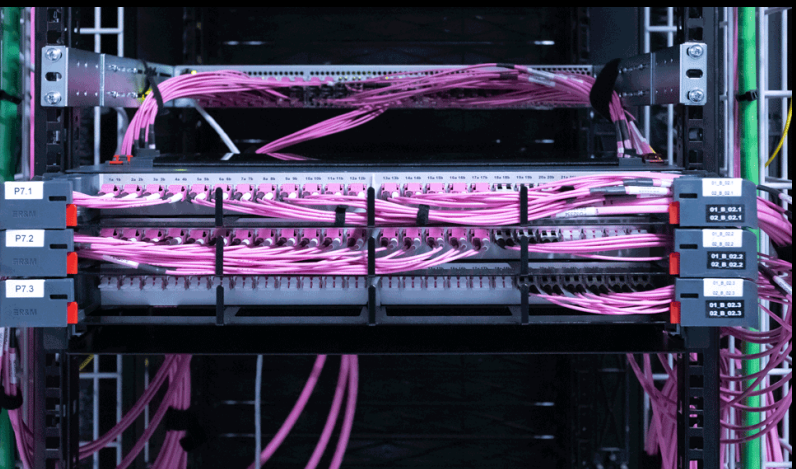
Measurements are often taken before the cable has been prepared for shipping (before being re-spooled) and spooling can have a significantly detrimental effect on a cable – especially solid core copper cable. Therefore, the original test results that come with the supplied pre-terminated link will often turn out to be very different than the performance values of the cable once on the spool – let alone after it has been pulled off the spool again and installed on-site.

That’s why it's vital to always re-test after installation. Field certification confirms integrity hasn’t been compromised during pulling or handling. No-one knows the hardships the cable may have been through during shipping and installation. That’s why it’s essential, as well as standards compliant, to test each link once it has been installed and is in-situ.

SEE THE LIGHT

If systems are tested as a channel (either copper or fibre), make sure to test with patch cords in place and ensure the patch cords used in the test remain with that link. Testing as a permanent link allows connection and disconnection of patch cords at any time.

Light source power meter (LSPM) and optical time domain reflectometer (OTDR) testing are both acceptable for testing fibres – although LSPM provides faster, more accurate loss testing. Conduct bidirectional measurements wherever splices are present, as per ISO/IEC standards. During installation, visually inspect connector end faces, clean connectors with lint free materials and isopropyl alcohol and





inspect again before mating to ensure low loss connectivity and long-term reliability.

MONITOR AND MANAGE

It is important to monitor bending radii closely during installation, especially through ducts and in outlets, since tight bends can cause micro cracks and signal attenuation in fibres. In addition, verifying that polarity and pinouts match the design for fibre MPO/MTP and copper assemblies is highly recommended. Saving field test results alongside factory reports is advised, as this helps with warranty claims and troubleshooting.

Degradation of performance during installation can be massively increased when the terminated ends are exposed. Vibration, impact and elongation at the end points of the link will have a direct influence on the overall performance once installed and tested. Protecting the cable ends during installation can ensure performance values which are more consistent with the original post-manufacture test results.

EXACT SCIENCE

Pre-terminated cabling can offer speed of installation, performance consistency and reliability – but only when selected, installed and tested with precision.

By matching quality solutions to the application and environment, safeguarding cables during handling and validating performance in the field, you can ensure long-term network integrity and maximise the value of pre-terminated technology. ■



ANDREW SEDMAN

Andrew Sedman is head of technical support and training at R&M. He drives content of the training modules for R&M's partners worldwide and is owner of the warranty program and technical support. He has extensive experience in the design and management of structured cabling across university campuses, airports, data centres and offices.

HellermannTyton

HellermannTyton has developed a full data centre connectivity solution that is designed to offer high density optical fibre capacity, excellent cable management and panel housing.

RapidNet Ultra is a cassette based pre-terminated system that delivers a wide variety of options and flexibility when designing a data centre network. RapidNet Ultra takes the existing data centre fibre solution beyond today's requirement, offering even greater density while accommodating very small form factor connectivity. This supports tomorrow's requirements for high bandwidth, advanced network architectures and Ultra Ethernet.



To support the RapidNet Ultra solution, HellermannTyton has produced a Data Centre Cabling Guide to help specifiers and data managers choose the best RapidNet system to achieve their network design. It covers everything from optical transceivers to polarity and data centre architecture and topology, assessing the key benefits and considerations at the design phase.

To complete the data centre solution, HellermannTyton can now offer GigaDuct, the brand new fibre raceway solution, designed for high performance fibre routing in your data centre.

For more information **CLICK HERE.**
www.htdata.co.uk

Elevate

Elevate offers pre-configured optical fibre connectivity in partnership with Senko, providing enhanced MPO solutions for high density data centre environments. The collaboration combines Senko's ultra-low loss multi-fibre push on (MPO) and very small form factor (VSFF) connector technology with Elevate's UK-based termination facility to deliver fully tested, inspected and ready to install fibre assemblies.

Elevate's state-of-the-art Config facility, located in Birmingham, features a purpose built fibre room with dedicated zones for multi-fibre and high density terminations. With demand for 400Gb/s, 800Gb/s and

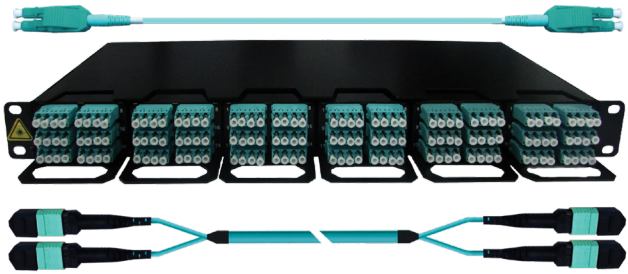


even higher speeds continuing to grow, Elevate's experienced team can turnaround pre-configured MPO systems within short timescales to accelerate deployment while maintaining high performance and reliability.

Through Elevate's online MPO Configurator, users can build custom MPO connectivity in seconds, specifying lengths, connectors, fibre modes and polarities to create tailored, high performance assemblies ready for immediate deployment.

CLICK HERE to discover more or to follow Elevate - Future Faster on LinkedIn and get the latest updates **CLICK HERE.**
www.elevate.excel-networking.com

STL - Sterlite Technologies



STL delivers high performance, end-to-end optical fibre cabling systems that are tailored for data centre inside plant (ISP) applications, especially for the white space area.

STL's solutions are designed to simplify complexity and support seamless network upgrades. STL offers a complete range of LC and MPO connectivity in singlemode and multimode (OM3/OM4) variants. Low loss assemblies enable cost effective edge deployments, while ultra-low loss options ensure superior performance in high speed core applications. All MPO assemblies and cassettes follow Method B polarity for consistency and ease of use.

Our structured cabling systems are fully compliant with global standards – ANSI/TIA-942, TIA-568 and ISO/IEC 11801 – and are backed by a 25-year performance warranty. STL's structured cabling solutions are engineered for scalability, performance and long-term reliability.

To find out more **CLICK HERE.**

stl.tech

Inside Networks

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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.

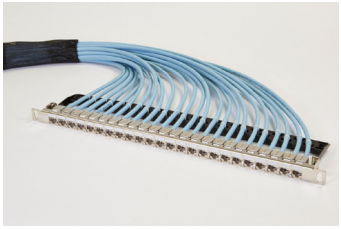
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Excel Networking Solutions' Specialist Support Services deliver high quality, pre-terminated copper and optical fibre solutions that are designed to meet the demands of rapid deployment projects.



The pre-terminated copper range covers Category 5e through to Category 7A in both screened and unscreened formats, supplied as single assemblies or loomed bundles – each fully tested, inspected and traceable under Excel's 25-year system warranty.

On the fibre side, Excel provides singlemode and multimode pre-terminated assemblies (OM1-OM5 and OS2) with bespoke breakout lengths, precision machine polished terminations and interferometer verified ferrule geometry.

These plug and play assemblies can reduce installation time by up to 75 per cent, while minimising on-site waste. Suitable for projects of any scale, Excel's Specialist Support Services portfolio enables installation teams to specify, receive and deploy fully tested infrastructure with minimal on-site effort – saving time, reducing cost and ensuring reliable network performance from day one.

To find out more **CLICK HERE.**
www.excel-networking.com

Networks Centre

Pre-terminated cabling systems – are they always the best solution?



Reduced time on-site
- Requires accurate measuring of cable lengths.
- Cable pathways and/or racks required to accommodate additional slack.

Some connectors aren't designed for field termination including:
- Standard style Category 6A RJ-45 plugs used for switch harnesses.
- MPO connectors.

Ensuring delivered products are defect free
- Manufacturers of high quality systems test more frequently through the manufacturing process.
- However, issues can still occur, so a pre-terminated system is the safest option.

Networks Centre offers pre-terminated systems from manufacturers like Panduit, Leviton and Siemon, and can assist customers in choosing the right product to include:
- Pathways design – to accommodate pre-term (dropouts, etc).
- Gender and polarity – can be problematic when adding to existing MPO systems.
- 50/50 approach – can't get the exact length or can't fit connectors through an aperture, for example, firestop? Consider cutting double length assemblies in half, trimming to length and field terminating the blunt end.

To find out more **CLICK HERE.**
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Forward thinking

Alan Keizer of AFL explains the networking foundations for advanced AI clusters and identifies strategies for performance, scalability and resilience

Over the past decade, AI workloads have grown not only in size but in complexity, requiring a fundamental shift in data centre network design. Historically, hyperscale data centres were referred to as massive facilities built by leading cloud or search companies such as Google, Microsoft, Amazon and Amazon, deploying tens of thousands of servers across expansive network fabrics.

MEETING THE NEED

Advances in complex AI computations have pushed the limits of traditional network architectures, necessitating innovation in many areas including rapidly scalable network topologies and robust interconnect technologies. Today, the notion of hyperscale has expanded, applying wherever AI clusters demand ultra-high bandwidth, ultra-low latency and enhanced system reliability.

Training large models in synchronous or segmented workflows, with frequent data exchange among many accelerators, imposes strict requirements on latency, bandwidth, packet loss, fabric and even cabling characteristics. One of the infrastructure innovations helping address these pressures is pre-terminated optical fibre cabling. It enhances deployment speed by replacing on-site tasks such as stripping and splicing with simplified, plug and play efficiency.

This article explores advanced networking in AI clusters, focusing on five main areas – the networking implications of scaling-up and scaling-out, networking architectures and physical layer demands, cabling strategies and the role of pre-terminated fibre, emerging technologies and operational considerations including maintenance and lifecycle cost.

1. SCALING-UP VS SCALING-OUT

AI clusters scale in two complementary ways. Scale-up (making individual nodes more powerful with more accelerators per node, more tightly coupled memory and faster interconnects within a node) and scale-out (adding more nodes, distributing training or inference over the wider fabric).

In scale-up, the focus is on high bandwidth, very low latency interconnects. Within a chassis, rack or across adjacent racks, connections are kept short, helping to achieve the necessary tight control over signal integrity. In scale-out, the network connects nodes and data storage (possibly geographically distributed), which demands:

- High port counts for high bandwidth switching (often 400Gb/s, 800Gb/s and moving toward 1.6Tb/s).
- Optical transceivers that support longer reach, low latency and lossless packet delivery.
- Robust data centre interconnect (DCI) for clusters spread over moderate distances.

2. NETWORKING ARCHITECTURES AND PHYSICAL LAYER DEMANDS

As AI clusters grow, high performance in the physical layer, including optical fibre cabling, transceivers and patching,



becomes increasingly critical. Key demands include:

- High bandwidth per link. Modern AI clusters use 400Gb/s and 800Gb/s ports, moving toward 1.6Tb/s. These ports come with significant deployment considerations over cabling, switching fabric, power consumption and thermal management.
- Low latency and lossless behaviour. Both transmission latency and switching latency can lengthen training time. The high cost of packet loss drives preference for high integrity fibre links and careful network optimisation.
- Reach and optics. For intra-rack or intra-node, short reach connections suffice. For scale-out or DCI, a longer reach is needed. Linear optics (described below) are increasingly important for DCI, with newer transceiver standards pushing for more reach without power penalties.
- Cabling and patch management. As AI cluster densities increase, factors such as slack, clutter and mispatched or misrouted cables can lead to signal loss, airflow blocking and inefficient cooling. Because poor fibre work can create bottlenecks, keeping cable lengths short (often <200m in back-end networks) is important.

3. CABLING STRATEGIES AND THE ROLE OF PRE-TERMINATED FIBRE

Pre-terminated fibre cabling systems offer significant advantages aligned with evolving network demands. These systems arrive in precise lengths ready to install, avoiding time on-site for cutting, stripping, terminating and testing.

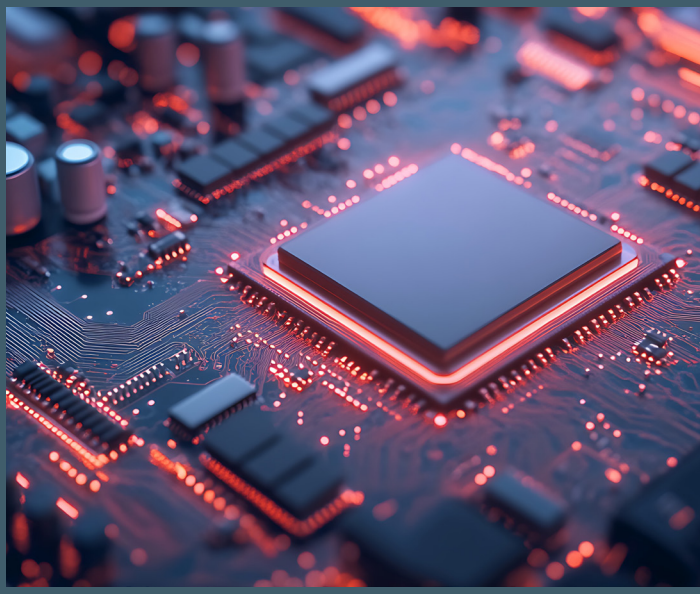
By eliminating variable skill levels, factory terminated fibre assemblies deliver consistency in loss, optical performance, polarity and connector quality. This supports reliable scale-up and scale-out, where small losses or variability can degrade performance. For advanced networking in AI clusters, pre-terminated fibre is not a luxury but part of best practice – especially at scale.

'By reducing installation risk, improving consistency and accelerating rollouts, pre-terminated fibre systems emerge as a strategic investment in leading edge AI cluster deployments.'

4. EMERGING TECHNOLOGIES

Beyond cabling, several technology trends are shaping what advanced networking looks like in future AI clusters. Also, standards like IEEE P802.3dj are pushing performance to enable movement not only from 400Gb/s to 800Gb/s but toward 1.6Tb/s.

- Linear optics (LRO/LPO). Linear optics (or coherent optics) are used to reduce latency and power consumption for white space links by eliminating embedded DSPs. For longer distances or DCI, coherent optics such as ZR and ZR+ styles are increasingly viable. Coherent optics in small form factors will likely become more common, especially for DCI links.
- On board, near packaged and co-packaged optics (OBO, NPO, CPO). Integrating optics closer to or within the switch or ASIC reduces electrical trace lengths, lowers latency, reduces signal degradation and may reduce power usage. This may become more important as SERDES rates climb and wiring becomes harder to manage.
- Chiplets and advanced packaging. As accelerators and switches use modular chip (chiplet) techniques and advanced packaging, advanced AI cluster networking best practice and optical fibre technologies must adapt through finer granularity, more ports, higher density and compatibility with denser front panels.
- Distributed model and segmented training. To support geographically distributed AI, model training can be partitioned (or segmented). This relaxes latency constraints but still places demand on bandwidth and requires reliable, high capacity links among segments.



5. AI CLUSTER OPERATIONAL CONSIDERATIONS

Building an advanced AI cluster network requires careful attention to reliability and long-term operability. Even minor link

failures can have disproportionate, outsized effects, making redundancy and spare capacity in link paths essential.

Connector contamination is another critical risk. While factory terminated assemblies can help to mitigate contamination risks, disciplined inspection and cleaning remain necessary. Broader fibre plant maintenance should also account for white space monitoring, allowing modular expansion without disruption.

For hyperscale cloud providers, where deployment speed and uptime directly affect business outcomes, downtime windows are both rare and costly. Because retrofits are often cumbersome and time intensive, strategies such as site standard designs, prefabricated modules, modular rack designs and pre-terminated cabling provide faster rollouts, smoother upgrades and improved lifecycle economics.



ATTENTION TO DETAIL

The term hyperscale now implies architectures capable of ultra-high bandwidth, predictable latency, minimal variability and fast adaptability. By reducing installation risk, improving consistency and accelerating rollouts, pre-terminated fibre systems emerge as a strategic investment in leading edge AI cluster deployments. Combined with emerging technologies and architectural strategies, the foundation for AI clusters is both resilient and cost efficient over time. Crafting an advanced AI cluster fabric rooted in high quality fibre, precise physical plant and forward looking optics technologies will be central to meeting tomorrow's AI performance, reliability and efficiency challenges. ■

Key takeaways:

- Incorporate pre-terminated fibre at the design stage.
- Allow for moderate overprovisioning of fibre and ports.
- Stay ready for transceiver advances, new form factors and emerging optical standards.
- Prioritise quality assurance, monitoring, physical inspection, cable management and redundancy.
- Plan for scale by provisioning infrastructure for node upgrades (scale-up) and more nodes (scale-out) while maintaining latency caps.



ALAN KEIZER

Alan Keizer is a senior technical advisor at AFL. Over the past four decades he has worked as an individual technologist, a business development leader and senior executive. His primary focus now is the development of optical fibre connectivity solutions for hyperscale computing.

Understanding upti

In this month's Knowledge Bank, where tech is demystified, Carrie Goetz explains redundancy and resiliency

There is one core rule in the data centre industry – stay up! Resiliency and redundancy are two uptime methodologies deployed to ensure that we don't go down and neither is fully effective without the other.

POWER RANGER

Redundancy refers to duplicating critical infrastructure system components supplying power and cooling. In addition to the duplicate leg, there are many times when a facility has triple or quadruple infrastructure power and/or cooling components. The power delivery paths start with the source and end-up at the cabinets for active electronics use.

The primary power source coming into a building is utility power, but site generated power adoption is growing. Site generated power may back-up the grid, feed the grid or be the primary on-site source. In some cases, the grid supplies back-up power, although this is less common.

READY AND ABLE

Secondary power sources include disparate grid attachment, generators, small modular reactors (SMRs), geothermal plants, solar, fuel cells or other suitable power sources with enough capacity to carry the full power load. Battery banks and uninterruptible power supply (UPS) systems provide temporary power to the facility until the secondary source kicks in as the energised power supply source.

Colocation facilities, larger enterprise facilities and those that require an additional layer of protection will have a third power distribution feed and equipment set, so that either the primary or secondary can go down due to failure, maintenance or repair. Some facilities add a fourth power feed for maximum uptime guarantees.

MAKE THE CONNECTION

Once the utility power enters the building, it connects to the power conditioning and distribution equipment consisting of power distribution units (PDUs), remote power panels, breakers, switchgear, transfer switches, battery banks, transformers, power busway, in-rack PDUs and remote power panels, breakers, energy management systems and inverters. These components break out, convert and distribute power to the cabinets for use by the computing equipment. Surge suppressors and arresters join conditioning equipment, ensuring that the power arrives at the destination equipment without brownouts, dips or surges.

These inside feeds are also redundant, with one leg to each of the primary and secondary power supplies in the electronics. This duplicate internal delivery infrastructure ensures the same primary and secondary back-up protection against interior power component failure. Capacity management systems and data centre infrastructure management (DCIM) systems ensure balance across the floor, the feeds and within cabinets.

ime



GROWING CONCERN

Power allocated and not used is considered stranded power and is a growing problem. Additionally, incorrect or assumed power consumption expectations, overprovisioning of equipment and improper allocations are just some areas of inefficiency. Today, we estimate roughly 55-65 per cent of provisioned power is considered stranded, which could be utilised to power equipment in more efficient configurations.

The cooling in the facility is similarly backed-up with redundant cooling systems. For facilities that use tier ratings, classes and other certifications, these ratings are audited and verified by a third-party. The site receives a rating based on the lowest performing component (power or cooling) on the rating scale. Others self-report unofficial ratings and some don't report at all.

MEET AND GREET

To address active equipment failure, data centres rely on resiliency, which builds out duplicate networks of attached equipment. Some facilities incorporate carrier hotels, while others have multiple carriers in one meet-me-room. Meet-me-rooms are where the carrier connections meet the end user communications equipment.

Servers generally come configured with two network and storage connections (copper or optical fibre) and two power supplies. The two power supplies are for redundancy and the two networking and storage connections provide communications resiliency. For even greater uptime resiliency, applications sit on multiple mirrored servers, sometimes in the same facility, sometimes in another facility. When mirrored, an application's uptime is provided by at least four network connections, four storage connections, four power connections and redundant cooling.

RESOURCE DEMAND

Packets are exchanged by active components, allowing the equipment to determine when to take over for its non-working counterparts and then restore service when they come back online. Storage devices may have their own separate network for back-up operations, keeping that traffic off the main live network.

If we follow both resiliency and redundancy across multiple sites, the amount of back-up to any application grows yet again. Duplicating applications and computing resources across multiple sites provides additional risk mitigation benefits due to geographic diversity. But there is also a demand on resources for that redundancy.

EFFICIENCY DRIVE

Companies continuously face risk to reward considerations for redundant and resilient infrastructures, apps and systems. As we strive to be better environmental stewards, controlling waste in and supporting our data centre resources will continue to remain areas of focus. Efficiency and sustainability are fascinating fields to help ensure the most efficient transportation of our bits and bytes. ■

Quick clicks

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

Intelligent PDUs For Greater Efficiency is a blog by **R&M.** **CLICK HERE** to read it.

According to latest analysis from **Onclusive,** Google, Nvidia and Microsoft dominate company level AI conversations, capturing over 65 per cent of share of voice. **CLICK HERE** for the rest of the findings.

Why Category 6A Cable Is The Smart Choice For Your Next Building Project is a Q&A with Vincent Lullo of **Panduit,** who answers the most pressing questions on the subject. **CLICK HERE** to read it.



FOR A FREE SUBSCRIPTION TO **Inside_Networks** CLICK HERE

UK workers are increasingly aware of how AI may reshape their jobs and show greater optimism than European peers, according to a study from **ADP Research.**
CLICK HERE to read more.

Today's Connectivity Choices Will Define Tomorrow's Cloud is a blog by Gary Bernstein of **Siemon,** who looks at how physical infrastructure is shaping the future of AI-ready data centres.
CLICK HERE to read it.



Powering The Fourth Industrial Revolution: What The Public Really Think About Data Centre Development is report by **Alpaca Communications.**
CLICK HERE to read it.

From Hype To Impact: How IT Leaders Are Redefining Digital IT Infrastructure In The Age Of AI And Energy Efficiency is a blog by Himamshu Prasad of **Schneider Electric.**
CLICK HERE to read it.

Two's company

Panduit's Hans Obermillacher examines the vital role of uninterruptible power supply (UPS) and power distribution unit (PDU) connectivity in data centres

In today's digital economy, uptime has become the defining measure of operational resilience. Enterprises, government agencies and service providers are increasingly judged by their ability to maintain seamless services, as even short disruptions can damage reputations, erode customer trust and generate significant financial losses. At the heart of ensuring this uninterrupted service are two foundational technologies – the UPS and the PDU.

CRITICAL ROLES

UPS systems deliver immediate back-up power and protect equipment from damaging fluctuations in voltage, while PDUs manage and distribute that power efficiently to every rack and device in the data centre. On their own, each technology is valuable, but the modern reality of hyperscale computing, hybrid IT deployments and edge environments requires something more – connectivity and interoperability.

When UPS and PDUs are designed to work together, they create a unified power ecosystem. The maximises uptime, simplifies management and generates a wealth of operational data that can be used to drive efficiency and sustainability.

BRIDGING THE GAP

The UPS has long been considered the first line of defence in power protection. By bridging the gap between utility power and back-up generators, a UPS ensures continuity during outages while also stabilising voltage. Modern systems extend these capabilities significantly.

Line-interactive UPS systems correct minor power interruptions, as well as sags and swells, without draining batteries, extending their lifespan and maintaining steady output. More advanced double conversion UPS systems convert incoming AC power to DC and then back to AC, producing clean, consistent sine wave output that shields sensitive equipment from all types of potential power issues including voltage and frequency variation and wave form distortions. These systems are increasingly modular and scalable, capable of expanding from as little as 1kVA to as much as 80kVA for edge computing sites or retailers and banks.

POWER PACK

Advances in battery technology have also reshaped the UPS landscape. Traditional valve regulated lead acid (VRLA) batteries, while proven, require frequent replacement and have long recharge times. Lithium-ion batteries, by contrast, last 2-3 times longer, recharge six times faster, perform reliably across wider temperature ranges and weigh 60 per cent less. They reduce maintenance costs, support higher density installations and contribute to sustainability goals by cutting waste and energy use.



In addition, modern UPS systems now include hot-swappable components, allowing batteries, network cards and even environmental sensors to be replaced without interrupting operations. When combined with intelligent management software, these systems enable centralised configuration, remote monitoring and predictive maintenance, reducing the risk of failures.

DRILLING DOWN

While the UPS provides resilience, PDUs serve as the backbone of distribution. Intelligent PDUs go far beyond simply delivering electricity from the mains or UPS to the rack. They provide granular visibility into consumption at the outlet level, making it possible to identify imbalances, reduce stranded power and optimise load distribution.

They allow administrators to remotely cycle outlets for troubleshooting or recovery in lights out facilities, while also incorporating advanced encryption and secure provisioning to guard against unauthorised access. Modern PDUs are engineered for ease of deployment, with features such as multi-axis swivel inlets, auto-rotating displays, 4-in-1 combo outlets and toolless mounting that reduce labour costs and speed installation.

Importantly, they also integrate directly with data centre infrastructure management (DCIM) platforms and network management dashboards. This enables operators to monitor not only power but also environmental conditions such as temperature and humidity.

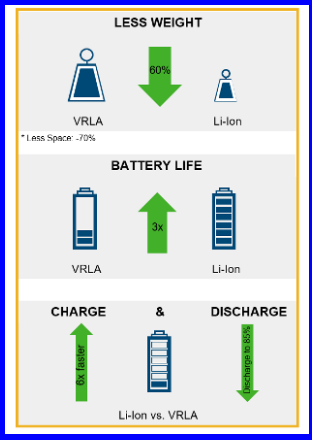
THE VALUE OF INTEROPERABILITY

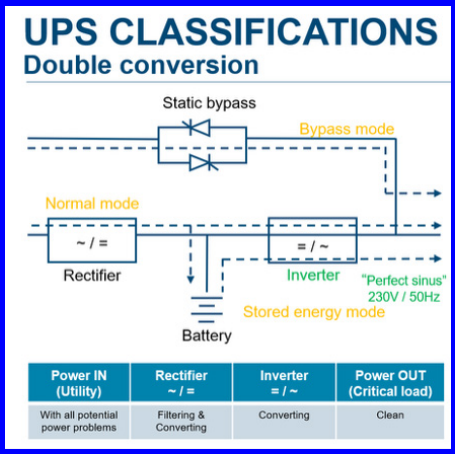
Previously, UPS and PDUs were treated as separate systems, each with its own data stream and management console. This fragmented approach created blind spots, as facility operators struggled to correlate UPS runtime with rack level consumption or identify how battery health impacted specific workloads. In the modern data centre, that siloed approach is no longer effective.

Connectivity between UPS and PDUs creates a single, integrated power

‘A significant shift in modern power infrastructure is the recognition that electricity itself has become a source of management data. When UPS and PDUs are integrated, they generate a continuous stream of actionable intelligence that goes far beyond simple consumption reporting.’

ecosystem that allows operators to see the entire chain – from utility feed through back-up batteries to individual server outlets – on one dashboard. This unified view provides proactive insights into potential risks. For example, when a UPS signals battery degradation, administrators can immediately identify which circuits and outlets are most at risk and, in some cases, automatically rebalance loads to prevent service disruption. Intelligent PDUs also send real-time alerts when breakers approach their limits, allowing operators to redistribute loads before a trip occurs. The result is an infrastructure that not only reacts to faults but anticipates and prevents them.





ALWAYS ON

Interoperability enhances uptime during maintenance. Intelligent PDUs with hot-swappable controllers and zero touch provisioning minimise disruption when updates are required, while centralised firmware automation reduces the burden of manually updating devices. In controlled testing, intelligent PDUs demonstrated installation and update times more than 20 minutes faster than comparable models – a seemingly small improvement that translates into meaningful uptime when multiplied across numerous devices.

Security also benefits from a unified approach. As PDUs become network connected, they must meet the same cybersecurity standards as other enterprise systems. Certificate based authentication, asymmetric encryption and compliance with standards such as IEC 62443 ensure that the power distribution layer does not become a vulnerability. When paired with secure UPS interfaces, the integrated ecosystem helps organisations meet the rigorous requirements of regulated industries such as finance and healthcare.

SOURCE OF DATA

A significant shift in modern power infrastructure is the recognition that electricity itself has become a source of

management data. When UPS and PDUs are integrated, they generate a continuous stream of actionable intelligence that goes far beyond simple consumption reporting.

This data supports energy optimisation by correlating outlet level consumption with workloads, enabling IT teams to shift loads or retire inefficient equipment. It informs capacity planning, ensuring that operators can expand infrastructure without overprovisioning or risking overloads. Integration with environmental sensors allows power usage to be mapped against temperature, humidity and even leak detection, helping to prevent overheating or water damage. In colocation environments, intelligent PDUs provide the metering accuracy required for tenant billing, ensuring transparency and trust.

As data centres become more distributed, with workloads extending into edge facilities and hybrid environments, the portability and standardisation of this data is even more important. Organisations need consistent insights, whether they are managing a hyperscale site, a regional hub or edge deployment, and interoperable UPS and PDU systems make this possible.

WITHOUT COMPROMISE

Data centre operators face constant pressure to expand capacity and efficiency while reducing costs and complexity. The integration of UPS and PDU systems offers simplified deployment and management without compromising resilience.

Intelligent PDUs embody this philosophy by combining outlet level monitoring, secure communications and visual enhancements like colour coded outlets into a package that is both powerful and easy to use. UPS systems, meanwhile, continue to evolve toward higher efficiency, longer lasting batteries and modular scalability that allows organisations to grow without disruptive overhauls.

The guiding principle is not to overwhelm operators with raw data but to provide actionable insights that make operations easier. Centralised configuration tools, predictive maintenance analytics and zero touch provisioning enable teams to manage growing complexity with fewer resources. This is the essence of doing more with less – a philosophy that increasingly defines modern IT infrastructure.

ESSENTIAL SELECTION

By unifying protection and distribution, modern UPS and PDU systems ensure that data centres are not just resilient but adaptive, capable of anticipating problems before they occur, scaling seamlessly with demand, and contributing to broader goals of efficiency and sustainability. In a world where digital operations underpin nearly every facet of life and business, this integration is no longer optional, it is essential. ■



HANS OBERMILLACHER
Hans Obermillacher is senior business development manager for data centres EMEA at Panduit. He has over 20 years' experience in the data centre industry.

Panduit

Panduit's EL2P iPDU redefines power management standards and empowers data centre operators to maintain uptime, optimise capacity and enhance sustainability without compromise. It integrates advanced metering accuracy, robust cybersecurity, flexible outlet configurations and comprehensive environmental sensing.



EL2P is designed for metering accuracy of ±0.5 per cent, ensuring precise energy consumption data, Power Usage Effectiveness (PUE) optimisation and sustainability initiatives. 4-in-1 outlets offer maximum flexibility and each outlet can function as C13, C15, C19 or C21.

EL2P provides dual Gigabit Ethernet with daisy-chain capability of up to 64 iPDUs on a single IP address. Native Cisco Nexus Dashboard integration provides energy usage and sustainability insights across data centre assets. Secure zero touch provisioning (sZTP) enables rapid deployment and configuration with minimal manual intervention.

Available in single-phase and three-phase models with input capacities for EMEA ranging from 5kVA to 43.5kVA, the EL2P series accommodates diverse global standards with dual rated approvals for North America and EMEA regions. Tool-less vertical mounting, multiple colour chassis for feed identification and plug and play digital sensors further streamline deployment and environmental management.

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

Schneider Electric

Schneider Electric's Easy UPS 3-Phase Modular is a robust UPS designed to protect critical loads. It 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 available in the market.

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



Elevate

Elevate - Future Faster delivers advanced power management solutions through strategic partnerships with nVent and Schleifenbauer, providing intelligent, high density power distribution and monitoring systems designed for high performance data centre environments.



With nVent, Elevate supports modular overhead busway systems of up to 400A per rack, offering scalable architecture that preserves valuable rack space while enhancing safety and operational flexibility. The Schleifenbauer partnership adds European manufactured iPDUs featuring advanced energy management software, hot-swappable control modules and rapid lead times, enabling real-time monitoring and optimisation of rack level power consumption.

These solutions translate to faster deployments, fewer power bottlenecks and greater visibility across infrastructure. Through its ongoing RePower Trade-In for Tomorrow promotion, running until the end of December, Elevate also offers the opportunity to trade-in legacy PDUs for new intelligent solutions, supporting sustainability, efficiency and future growth.

CLICK HERE to discover more or to follow Elevate - Future Faster on LinkedIn and get the latest updates **CLICK HERE.**
www.elevate.excel-networking.com

Austin Hughes

InfraPower 2000 Series Z Range iPDUs from Austin Hughes are engineered to support the demanding power requirements of modern data centres and high density AI compute environments.

Designed for enterprise reliability, each iPDU features dual Gigabit Ethernet LAN IP connectivity for fully redundant network access, with no external dongles required, ensuring continuous uptime reporting and system visibility. Advanced authentication support includes Active Directory (AD), LDAPv3/LDAPS, RADIUS or secure local credential database. New smart meters are also included with improved 0.5 per cent metering accuracy.

Monitored and switched models provide comprehensive remote monitoring and on/off outlet switching functionality from anywhere in the world, enabling proactive energy management and fast fault isolation. Supporting single-phase to three-phase configurations, these iPDUs include intelligent metering and lockable or combo IEC outlets for enhanced safety.

With customisable voltage, current and plug configurations, the InfraPower 2000 Series Z Range delivers scalable, adaptable and resilient power distribution for next generation data centre infrastructure.

CLICK HERE to find out more or to send an email **CLICK HERE.**
www.austin-hughes.com



Current events

David Watkins of Virtus Data Centres looks at power management in the age of AI

Generally, we assume that AI will provide humanity with a progressive leap forward and, overall, it is expected to be a net positive. But for this AI revolution to come to fruition, the complexities of intricate supply chains and processes need to be understood and tackled to enable what is becoming society's digital lifeblood.

STOP AND SEARCH

Let's look at a simple search query as an example – users type a question into a web browser and get an answer. They do not think of the technological implications of how that information is searched for, found and delivered, which is all via data centres. Nor do they think of the environmental implications behind how it happens, including the consumption of power, generation of heat, use of water and carbon emissions created by something that is taken for granted as part of life.

Data centres are a critical enabler of AI because they provide the essential IT infrastructure including the specialised hardware, massive computing power and scalable networks needed to train and deploy complex AI models. Given that Statista predicts that the AI market will grow from $244.22bn in 2025 to $1.01tn by 2031, one of the biggest challenges that data centres face is the availability of power – enough power to operate the facilities that customers are demanding.

AI AND ENERGY USAGE

Today, data centres consume over two per cent of the world's electricity, and this figure is expected to climb steeply as AI workloads proliferate. Goldman Sachs estimates that AI will drive a 165 per cent increase in data centre power demand by 2030.

This is why power is a defining challenge. AI-driven applications rely on high performance graphics processing units (GPUs) and central processing units (CPUs) that consume substantial amounts of power. This hardware generates significant heat, so power is also required to operate

'AI-powered energy management systems are being deployed to improve efficiency in real-time. They can reduce power consumption by analysing server temperatures and dynamically adjusting cooling mechanisms for efficiency. They can pinpoint exactly when and where cooling is needed, conserving power and reducing costs.'



effective cooling solutions that are essential to facilitate optimal performance, reliability and longevity of IT systems.

UNPREDICTIVE TEXT

Another challenge is that AI workloads are characterised by their unpredictability. This variability can strain traditional power systems and potentially result in performance degradation or equipment damage. And in densely packed AI IT environments even minor disruptions in power delivery can cascade into significant downtime or data loss.

Existing data centres have power secured. In the main, with the addition of alternative sources of energy, the UK currently benefits from sufficient capacity and unplanned outages are rare. The challenge lies in the need to increase storage of power from renewables and the upgrades required to the grid to deliver the power where it is needed. To help balance overall energy use, as well as reduce reliance on fossil fuels, some data centres are introducing smart grid integration with national electricity grids to provide demand response services.

GENERATION GAME

Data centres are typically mission critical facilities providing resilient and secure services to customers to enable 24x7 availability. Existing facilities will have secured power agreements for the power capacity required, plus standby



generation on-site through uninterruptible power supply (UPS) systems to provide contingency if utility power is not available.

This means that UPS systems play a critical role in supporting operational efficiency and maintaining uninterrupted performance. They also provide the reliability, scalability and energy efficiency needed to support the demands of AI-driven workloads. UPS systems that are designed for AI and high density applications can dynamically adjust to rapid load changes, maintaining consistent power supply and protecting critical infrastructure from power anomalies by stabilising load fluctuations.

Modern UPS systems address the unique requirements of AI applications by leveraging features such as real-time monitoring, predictive analytics and dynamic load balancing. These tools enable operators to anticipate potential issues and optimise power usage so the infrastructure remains adaptable to evolving workloads.

AI AND POWER MANAGEMENT

In addition to being poised to drive the increase in data centre power demand by 2030, AI could also be a game changer in helping to tackle the power challenge. Utilising AI, data centres could become more energy efficient. A study from Duke Energy showed that data centres using AI-driven predictive maintenance reported a 30 per cent reduction in unplanned outages and a 40 per cent improvement in operational efficiency compared to those that don't.

AI enables data centres to shift from reactive to proactive management.

Historically, data centre operators had to rely on manual interventions and static systems for tasks like energy management and equipment monitoring. Today, AI algorithms can take these processes to the next level by continuously learning from operational data – spotting trends and predicting potential failures before they happen.

These enhanced monitoring capabilities are particularly valuable in high density environments, where the stakes for downtime or equipment failure are higher. When systems operate at peak efficiency, these tools contribute to the overall resilience and reliability of data centre infrastructure.

DECISION MAKING

By leveraging historical data and live environmental inputs, AI can optimise each decision, helping to achieve minimal resource waste and operational downtime. This allows data centres to significantly enhance energy efficiency, which is crucial as the industry grapples with rising power demands and increasing pressure to minimise carbon footprints.

Using real-time data and predictive modelling, AI can help ensure that energy is only used when and where necessary. AI-powered energy management systems are being deployed to improve efficiency in real-time. They can reduce power consumption by analysing server temperatures and dynamically adjusting cooling mechanisms for efficiency. They can pinpoint exactly when and where cooling is needed, conserving power and reducing costs.

By analysing patterns in energy demand, AI systems can balance workloads more effectively, distributing tasks and workloads in a way that maximises performance whilst minimising energy consumption. During times when there is stress on the grid, some AI workloads can be migrated to other locations to reduce pressure. AI tests also help to check that UPS systems can handle rapid load variations, high density demands and unpredictable power profiles.

DEEP IMPACT

AI's role within data centres has expanded from basic automation to sophisticated solutions that elevate operational efficiency, predict maintenance needs and even bolster cybersecurity. Power management in data centres will continue to evolve alongside new technologies but there needs to be a balance between reducing environmental impact without compromising operations and reliability, whilst at the same time enabling AI to reach its potential. ■



DAVID WATKINS

David Watkins is solutions director for Virtus Data Centres, working with customers to provide customised solutions. He has been with company since 2009, where he was previously service delivery director and head of operations.

Start Campus selected by Nscale for the deployment of Nvidia Blackwell AI infrastructure to support Microsoft

Start Campus, in partnership with Nscale, has announced one of the European Union's (EU) first deployments of the Nvidia GB300 NVL72 platform at its SIN01 data centre in Sines, Portugal. This deployment demonstrates Start Campus' and Nscale's position as two of the EU's trusted AI infrastructure partners, supporting Microsoft in delivering advanced AI capabilities across the continent.



Nscale selected Start Campus' AI-ready site for its strategic location, deployment readiness and ability to scale. The deployment at Start Campus supports rack densities surpassing 130kW, delivering the power and cooling required for advanced AI workloads, and is engineered to stay ahead of rapidly advancing AI needs. The project also directly aligns with Portugal's position as a leading force in the EU's AI economy.

Vantage Data Centers expands European footprint with second Italian campus

Vantage Data Centers has announced the expansion of its Italian footprint to include a second campus in Milan. With an investment of more than €350mn, the MXP2 campus is designed to support the growing demand for high performance, scalable digital infrastructure in the country.

Located in Castelletto, which is less than 10 miles from central Milan, the campus will feature two modern data centres delivering a combined 32MW of critical IT capacity across approximately 10,000m². The first phase is slated to be operational in the spring of 2026. Vantage's initial investment in Milan with its MXP1 campus laid the foundation for the company's continued growth in the region, and the addition of MXP2 further reinforces this commitment.



Vantage's multiple campus developments were recently recognised by the Italian government under Article 13 of Decree Law 104/2023 as nationally strategic infrastructure investments supporting the country's economic agenda. Through this program, Vantage will invest approximately €4bn and employ an estimated 4,000 workers over eight years during construction, while also creating approximately 250 permanent jobs.

Telehouse breaks ground on new £275mn data centre

Telehouse Europe has broken ground on its new Telehouse West Two data centre at its London Docklands campus. The £275mn investment in the new data centre is set for completion in 2028. Flynn Management & Contracting will work with Jones Engineering Group to deliver the project.



The new facility will be purpose built to support the rapid adoption of emerging technologies such as AI. It will integrate both air and liquid cooling technologies to meet growing demand for high density compute environments, allowing customers to scale without compromise.

Telehouse West Two will offer two meet me rooms and four dedicated secure connectivity risers.

Designed with sustainability, resiliency and security at its core, Telehouse West Two will offer uptime guarantees of 99.999 per cent to ensure uninterrupted operations for customers. The data centre has been designed to BREEAM Excellent standards, indicating a high level of environmental performance against a widely recognised sustainability assessment for buildings. 100 per cent renewable energy will power its operations and it will deliver exceptional efficiency.

PROJECTS & CONTRACTS IN BRIEF

Keysource is the principal contractor on Deep Green's first data centre deployment in the UK's northwest, colocated with the Move Urmston Leisure Centre in Manchester. Recaptured heat energy from the data centre will be recycled to warm a swimming pool. It will reduce the pool's gas requirements, leading to substantial cost savings and a reduction in carbon emissions.

The IOEMA Project, which is planning to lay subsea fibre optic cables in Northern Europe, has selected Greenhouse Datacenters as a partner for the landing of the IOEMA subsea cable in Scheveningen. This marks the seventh landing point in Northern Europe and the second in the Netherlands for the IOEMA cable.

AVK has signed a strategic agreement with Landmark Power Holdings to deliver low carbon, behind the meter power solutions for data centres using carbon capture technology. The three year partnership will deploy Rolls-Royce mtu engines integrated with ASCO carbon capture across a UK pipeline totalling up to 350MW, including sites at Mill Hill, Dagenham, Heathrow and Iver.

In partnership with Purple, the Natural History Museum of Los Angeles County has introduced interactive wayfinding maps and high speed guest Wi-Fi across its 11-acre campus, allowing visitors to navigate exhibits, discover new points of interest and engage more deeply than ever before.

Mayflex

Mayflex has launched ReelCycle – a revolutionary returnable reel solution for cut to length optical fibre cables. ReelCycle is designed to deliver more for your business and the planet.

ReelCycle is the Mayflex promise in action – Deliver, Return, Refund, Repeat. It's about making sustainability simple, practical and rewarding for everyone. Whether you're working to ISO 14001 standards or simply want to do the right thing, ReelCycle helps you meet sustainability goals and win more projects.

Made from 100 per cent recycled composite materials, ReelCycle reels are robust, weatherproof and site-ready. They're also 100 per cent returnable – helping you reduce waste, tidy your site and lower your carbon footprint.

Here's how it works:

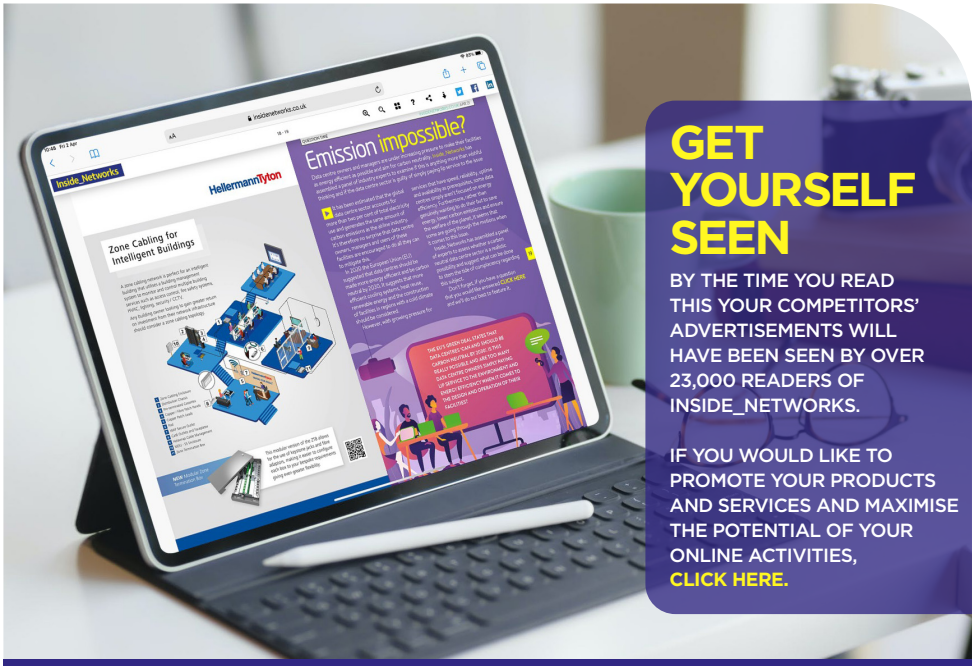
- Pay a £10 deposit per reel at order.
- When the reel(s) are empty, simply scan the QR code to arrange a collection – Mayflex covers the cost.
- Once returned, your account is credited with the deposit.



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Arista R4 Series Advantages

1	EOS for Data Center / AI Center	Single EOS Across Portfolio for Multiple Uses Internet Scale Routing, Security, and Telemetry
2	Lower AI Job Completion Time	Up to 44% Faster Job Completion Time (JCT)
3	Lower Power per Gbps	Up to 65% Lower Power per Gbps Latest 5nm Silicon Process
4	Higher Speeds, Higher Radix	Up to 3.2 Tbps per Port with HyperPort Up to 576x 800G or 128x 3.2T per System
5	Integrated Quantum-Safe Security	Wire-Speed, Multi-Layer Encryption per Port TunnelSec: MACsec, IPsec, and VXLANsec

Arista Networks has launched the next generation family of R4 Series platforms for AI, data centre and routed backbone deployment. The R4 family of routers helps customers reduce total cost of ownership while ensuring high performance, low AI job completion time, low power consumption and integrated security.

Arista enables high capacity data centre and AI clusters with a dense 800Gb/s R4 system, with the introduction of 3.2Tb/s HyperPorts. This offers distributed AI workloads with ultra-capacity for distributed scale-across and multiplanar networking. Security is integral to the 7800R4 and 7280R4, as each platform supports wirespeed encryption on every port simultaneously.

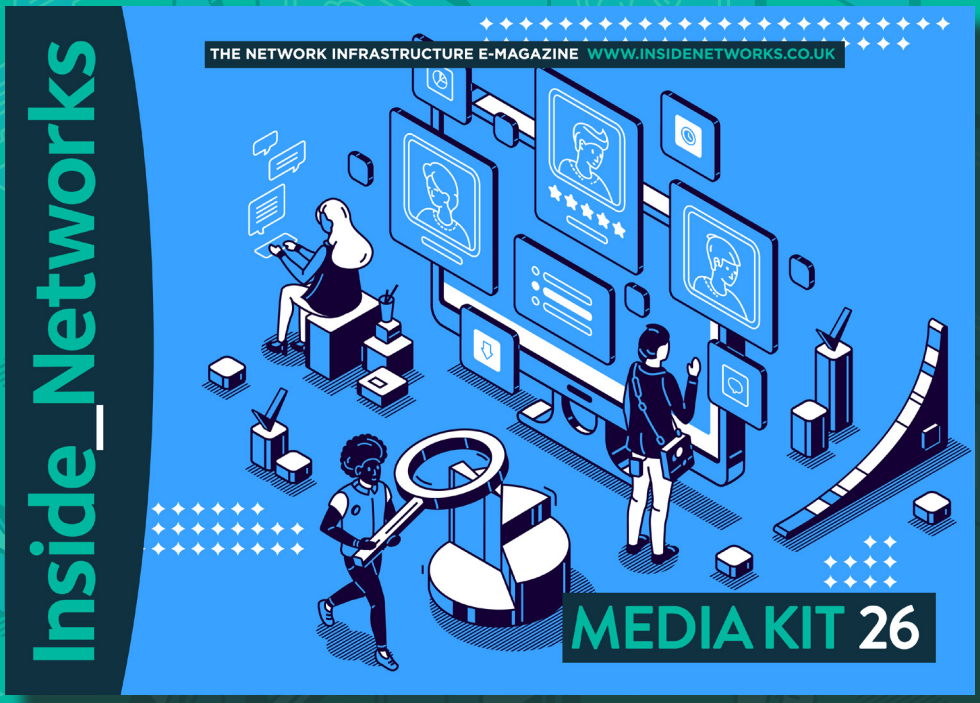
The R4 series routers deliver a portfolio of fixed and modular solutions for scalable and multiple use cases. The density and flexibility provided by the R4 family optimise customer network architectures with efficient two tier leaf and spine designs.

All R4 products deliver Arista EOS L3 features required for modern architectures using EVPN, VXLAN, MPLS and SR/SRv6. Each system ensures predictable latency via hierarchical deep packet buffering, coupled with scalable protection against packet loss during transient congestion.

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Mark Fenton of Cadence looks at how digital twins offer a road to success in the AI era



Generative AI grasped the minds of the world in an instant, altering people's lives, work and interactions. From here, the possibilities keep expanding and there is no slowing its potential – especially as the markets for AI technologies are expected to grow to over $800mn worldwide by 2030. In fact, some industries have already rolled out dozens of AI-powered robots to support humans in their daily roles.

UNDER PRESSURE

Yet, keeping pace with these ever-evolving capabilities requires data centres, which work relentlessly behind the scenes. They've become the backbone of AI innovation, but this role is not without strain. According to 74 per cent of respondents in Cadence's Innovation Imperative report, AI is putting increased pressure on data centres.

The compute infrastructure powering this transformation is a step change from everything that has come before, with power densities exceeding 120kW per rack and growing. As a result, operators face mounting pressure to not only manage AI's power hungry growth but to do so efficiently and responsibly.

This is where digital twins prove invaluable. By creating a virtual model of a data centre's operations, they allow operators to simulate and analyse performance, uncover inefficiencies, and identify opportunities for improvement and optimisation.

THE DUAL ROLE OF AI

AI plays a dual role in data centres. While

it fuels soaring power demands, it also enables smarter energy management, particularly when paired with digital twins. Together, they offer operators deeper insight into infrastructure performance, helping to optimise resource use and reduce operational strain. It's no wonder, then, that 73 per cent of data centre leaders see digital twins as game changers for driving innovation.

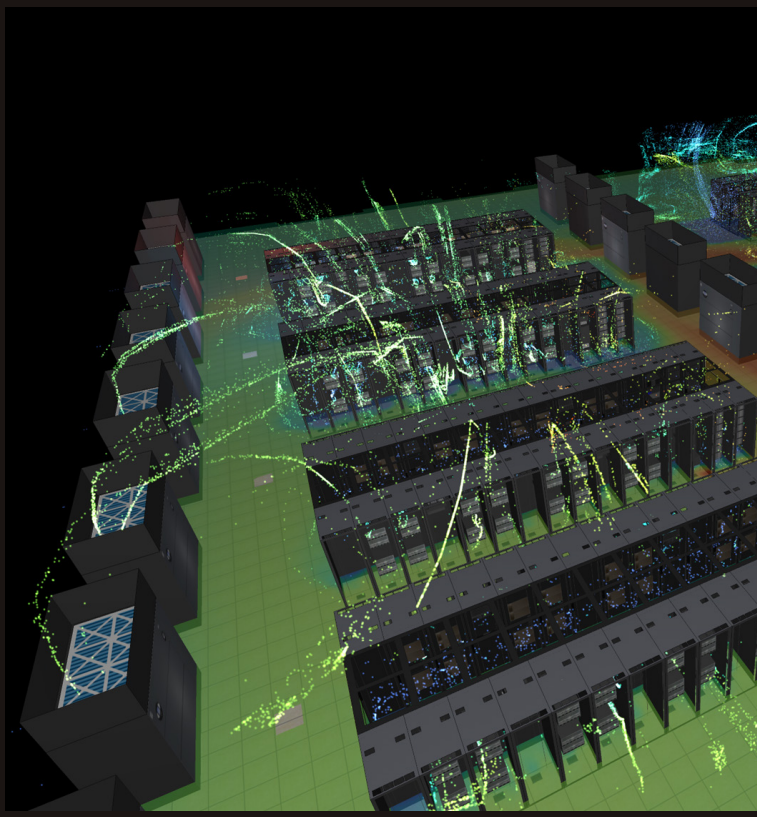
So, how are digital twins being used in practice? These models simulate operations, allowing teams to test scenarios, fine-tune systems and predict outcomes before making physical changes.

This holistic approach has revolutionised how facilities are designed and run – a crucial development given that 86 per cent of data centre leaders believe failure to innovate could have serious consequences. With 42 per cent of facilities already using digital twins and another 21 per cent planning adoption within the next year, this technology is clearly becoming a strategic imperative.

SPOTTING INEFFICIENCIES

Digging deeper into the specifics, digital twins can be used to uncover stranded capacity, which refers to unused or underutilised power, cooling or space that contributes to inefficiencies. At present, 29 per cent of data centre operators report this as a constraint. This means nearly a third of data centres are constantly trying to slot systems into place without full visibility of their available capacity, leading to unnecessary infrastructure investments and wasted energy allocation.

Beyond this, 60 per cent of data centre leaders say overprovisioning, which is the allocation of more resources than necessary, still occurs within their data centres. This is because operators often overestimate the capacity needed, due to visibility gaps. While this is understandable, as facility decision makers seek reliability, especially during peak periods, it wastes resources and contributes to higher operational costs.

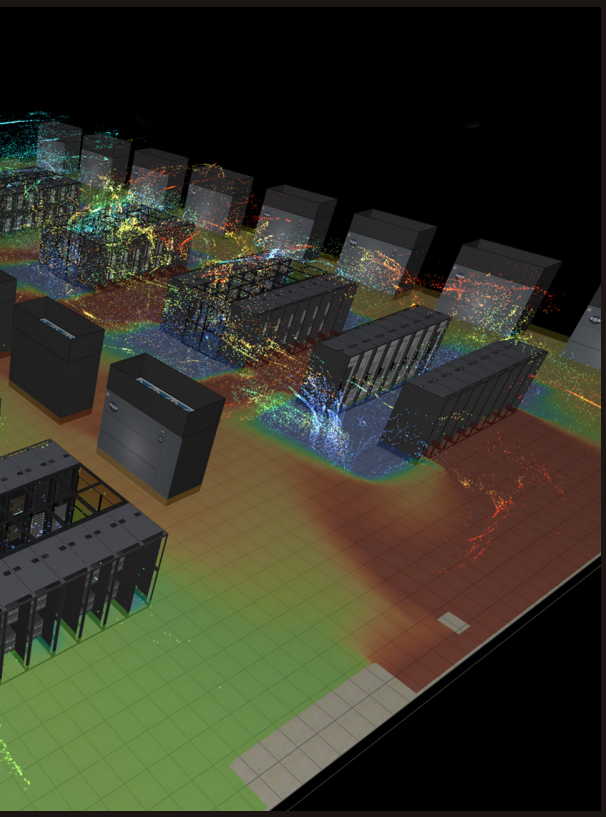


NEW RULES

The shift in server power density means that old rules of thumb no longer apply, leaving operators with more uncertainty and a higher chance of overprovisioning to retain a safety factor. However, with maximising the amount of compute being critical to AI applications, even small amounts of unused or misallocated capacity can collectively lead to a disproportionate impact on a given system's capabilities. To avoid these risks, data centres must be managed with greater precision.

'60 per cent of data centre leaders say overprovisioning, which is the allocation of more resources than necessary, still occurs within their data centres. This is because operators often overestimate the capacity needed, due to visibility gaps.'

A promising solution to this is the use of digital twins, which can simulate different scenarios to evaluate the impact of resource allocation decisions and flag areas of overprovisioning. By offering a data driven view of how resources are used, operators can better balance availability with demand, enabling more accurate provisioning and uncovering underutilised capacity that might otherwise go unnoticed.



COOLER OPERATIONS

Efficient resource management is only part of the equation. Data centre leaders must also address the cooling challenges created by high density AI workloads. With AI workloads generating intense heat and demanding significantly more power, air based cooling methods are reaching their operational limits.

That's why many data centre operators are recognising the need to move away from traditional cooling methods. In response, 45 per cent of data centre leaders have already implemented liquid cooling – a tactic that is far more effective at managing the higher thermal loads associated with today's high density computing environments.



What's more, another 19 per cent of operators are planning to implement liquid cooling within the next 12 months. This trend reflects a broader shift in infrastructure strategy, particularly as rack densities exceed the capabilities of air cooling.

DEEP INSIGHT

It's no surprise that this is where digital twin technology proves invaluable, processing vast datasets, detecting patterns and delivering insights that improve accuracy and responsiveness. All of these support operators to innovate by simulating and planning liquid cooling systems. For example, they offer granular insight into performance metrics like thermal efficiency, airflow dynamics and opportunities for heat reuse – insights that are difficult to obtain without physical testing.

Such a level of visibility reduces uncertainty, minimises risk and enables confident, data driven decisions. Crucially, by simulating innovative approaches such as waste heat recovery, digital twins help data centres move beyond operational efficiency toward long-term sustainability.

CHANGING THE GAME

From a planning and day-to-day standpoint, digital twins are giving data centres a new lease of life. They expose inefficiencies, flag stranded capacity, curb overprovisioning and allow teams to trial liquid cooling – offering full visibility. With AI pushing data centres to their limits, this kind of oversight and precision has never been more critical, and facilities need to take back control to meet the demands of tomorrow. ■



MARK FENTON

Mark Fenton is product engineering director for Cadence Reality DC Software. He has over 20 years of experience working in computational fluid dynamics (CFD) and a master's degree in mechanical engineering, which he uses to help data centre professionals optimise design and operations.

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