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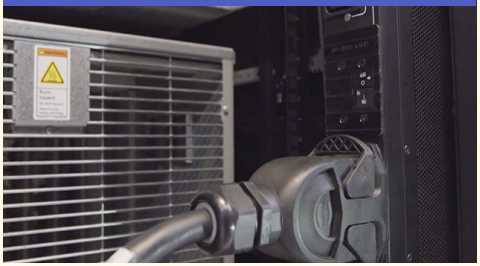

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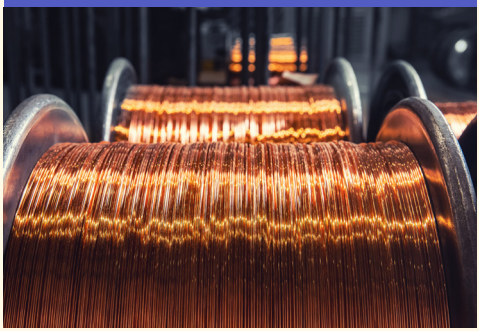

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The spike in data centre energy use caused by artificial intelligence (AI) will come as no surprise to anyone working in the sector. According to a study from the Vrije Universiteit Amsterdam School of Business and Economics, AI could consume as much energy as a country the size of the Netherlands by 2027, while data centres in Ireland consumed nearly one-fifth of the country's total electricity in 2022.

In this month's issue we have a special feature dedicated to this subject. CNet Training's Pat Drew shares his A-Z of terms, techniques and initiatives that are shaping the debate, while Jorlan Peeters of HyTEPS identifies the smart route to optimising data centre Power Usage Effectiveness (PUE). Ajay Kareer of then goes on to look at the need for reliable, energy efficient connectivity solutions in data centres.

We also have a special feature dedicated to copper cabling standards, comprising two excellent articles. In the first, James Withey, liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3, offers a fascinating insight into the intricacies of developing ISO/IEC generic structured cabling standards, and then goes on to provide an update on the latest developments. In the second, Arvind Patel of AEM compares the various copper cable certification standards and how they play an important role in formalising the testing requirements for cabling.

On the wireless side of things, Wi-Fi technology continues to push on, with Wi-Fi 7 set to positively impact the design and configuration of intelligent buildings. To outline the key considerations when specifying a network cabling infrastructure to support Wi-Fi 7 we have assembled a panel of industry experts to offer their advice.

Last but certainly not least, I'd like to say a massive thank you to all those who participated, sponsored and provided raffle prizes for the Inside_Networks 2024 Charity Golf Day. The amazing sum of over £9,500 was raised for Macmillan Cancer Support and a great time was had by all. You can see a round-up of the event in next month's issue.

Rob Shepherd
Editor

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The cloud continues to enable innovation in a tough economic climate

Research from the Cloud Industry Forum (CIF) has found that 100 per cent of organisations are now accessing cloud-based services to meet their needs, with the most common motivation being its potential to offer greater flexibility of IT spend and its ability to make them more agile as a business. The data also examined the continued prominence of artificial intelligence (AI) in fuelling innovation, and the continued importance placed on environmental, social and governance (ESG) efforts. Key findings from the research included:


David Terrar

- The preferred cloud-based services were AWS (used by 57 per cent of respondents), Azure (51 per cent) and IBM (51 per cent). 39 per cent of organisations reported using Google Cloud, 28 per cent Oracle and 18 per cent Salesforce.
- 33 per cent of respondents highlighted the cloud's potential to offer greater flexibility of IT spend, while 32 per cent of organisations noted better agility.
- 96 per cent of organisations believe that AI will be at least somewhat important to their organisation in the next five years, an increase from 86 per cent in 2023.
- 42 per cent of respondents reported that they consider AI among their most important IT projects, ahead of other considerations such as security and IT sustainability.
- 94 per cent of organisations are either planning to, or are already, using generative AI, with 62 per cent saying it is in use across at least some parts of the business.
- 40 per cent of respondents reported that IT sustainability is an important project for their organisation, underlining the sustained relevance of ESG-related initiatives.
- 78 per cent expressed that they plan to reach net zero by at least 2040 and 87 per cent plan to do so by 2050.

David Terrar, CEO at CIF, said, 'Cloud has long been a regular feature in any modern company's tech stack, and this year's research exemplifies how this remains the case as businesses across industries manage a challenging economic climate. With cloud services more or less ubiquitous now, attention should turn to where businesses can maximise its potential, particularly in crucial areas such as AI and ESG. Thanks to its inherent flexibility, cloud can help companies navigate these challenges with confidence.'

He added, 'Our research also indicates that AI's rapid rise has continued over the last 12 months and shows little sign of slowing. In fact, many of those surveyed highlighted AI as one of their most important projects, outranking other key considerations like security and cloud migration. Nearly all respondents said that AI is a part of their plans, but two thirds of them are already using it, likely representing the fastest adoption of new enterprise technology ever.'

Digital economy outperforms overall growth across OECD countries

The information and communications technology (ICT) sector grew by an average of 6.3 per cent between 2013 and 2023, which is about three times faster than the total economy across the 27 Organization for Economic Cooperation and Development (OECD) countries analysed. In many OECD countries, 2023 was a record year for ICT sector growth, with five countries – the UK, Belgium, Germany, Austria and the Netherlands – achieving growth rates above 10 per cent.

Mathias Cormann

On artificial intelligence (AI), investments and risks are on the rise, but adoption is highly concentrated. For example, investment in generative AI (GenAI) has grown from $1.3bn in 2022 to $17.8bn in 2023, while there has been a 53-fold increase in GenAI incidents and hazards reported by reputable news outlets globally since late 2022.

OECD secretary-general, Mathias Cormann, said, 'The ICT sector is a key driver of global growth. However, there are substantial differences between countries, with a gap of more than 10 percentage points between the economies with highest and lowest average sector growth rates between 2013 and 2023.'

Operators to invest over $200bn globally in cloud network services over the next four years to meet demand for cellular data

Juniper Research has found that operators will invest $26bn in cloud services in 2024, with expenditure growing to $65bn in 2028. It also predicts growth of 5G networks and the arrival of cloud-native 6G networks will result in a 110 per cent increase in cellular data over the next four years. This growth will be driven by the rising adoption of data intensive internet of things (IoT) use cases, such as automated manufacturing and vehicle infotainment systems.

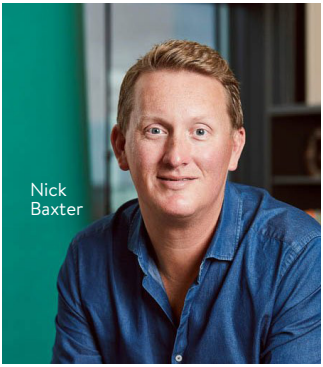
To manage this substantial growth in cellular data, operators must leverage cloud-based network management systems to automate the management of network resources in real-time and at a local level. Additionally, the report predicts that cloud technologies will be instrumental in enabling operators to achieve sustainability targets. Operators will use machine learning to automate network management, reducing power to network elements when user demand is low.


Alex Webb

Juniper Research's research analyst and author of the study, Alex Webb, remarked, 'Telecommunications networks are becoming more complex, requiring increasingly automated network management systems. However, operators must insulate mission critical traffic when reducing power to guarantee quality of service for enterprises.'

Half of boardroom leaders have slashed tech budgets amid economic uncertainty

Half of boardroom leaders admitted to slashing their tech budgets over the past year amid rampant inflation and fluctuating interest rates causing economic uncertainty, according to a report from The IN Group. Boardrooms in the US and UK have been hit hardest by economic turbulence, with 56 per cent cutting budgets in the US and 51 per cent in the UK, compared to only 41 per cent in the Netherlands and 39 per cent in Germany.


Nick Baxter

Although the turbulent economy has led to overall budgets being cut there are signs of green shoots ahead, with 81 per cent saying they have plans to increase tech investment over the next 12 months. Following the widespread innovation and adoption around rapidly evolving technologies, 78 per cent are looking to prioritise investment in automation to cut costs and boost efficiencies over the next year.

Nick Baxter, CEO of The IN Group, commented, 'It's essential for the boardroom to invest in technology to drive digital transformation and to stay ahead of the game. Technology evolution isn't slowing down for anyone, so those who continue to align their business and technology strategies, fuelled by investment, will be best placed for growth when the economy picks up.'

Over a third of businesses are unprepared for AI

Analysis from Fasthosts has revealed that 35 per cent of businesses polled are not ready to use artificial intelligence (AI) and other advanced technologies because of limitations in their existing IT infrastructure. In today's business landscape where a robust IT infrastructure is paramount, businesses must not underestimate the importance of creating an AI-ready environment. Yet, many are being held back by a lack of understanding and inadequate computing capacity within their current infrastructure.


Justin Bateman

60 per cent of polled businesses said that their understanding of technologies such as AI is non-existent or basic. Additionally, over half (61 per cent) noted that they are yet to evaluate how AI-ready their infrastructure is.

Justin Bateman, senior product manager at Fasthosts, said, 'It's alarming that more than half of businesses are unsure of limitations in their current IT set-up that could hinder the adoption of technologies like AI. By not evaluating this, businesses are depriving themselves of an AI-ready infrastructure that offers cost-effective scalability, data management and increased control over their IT environment.

GenAI offers an opportunity to level the playing field for women in tech

Generative artificial intelligence (GenAI) in the workplace has helped level the playing field for women in technology, according to Boston Consulting Group (BCG). It found that 68 per cent of women in the tech industry say they use a GenAI tool more than once a week, compared to 66 per cent of men, highlighting that women are on par with, and in some cases outpacing, men in terms of GenAI adoption.


Sai Bendi

BCG's report suggested that senior women are just as, if not more, aware of how critical GenAI can be in the workplace than men, while junior women tended to be less aware. BCG suggested the seniority gap could be due to junior women having less access to networks and discussions where GenAI strategy is formed, and they aren't as equally represented in GenAI initiatives as junior men.

Sai Bendi, software development manager at Encompass Corporation, commented, 'In tandem with the increased spotlight on gender diversity that we are seeing, there is no doubt that the acceleration and development of new technologies, such as GenAI, offers the potential to act as a catalyst for positive change.'

NEWS IN BRIEF

The Council of Europe has adopted the first-ever international legally binding treaty aimed at ensuring the respect of human rights, the rule of law and legal standards in the use of artificial intelligence (AI) systems. The treaty, which is also open to non-European countries, sets out a legal framework that covers the entire lifecycle of AI systems and addresses the risks they may pose, while promoting responsible innovation. The convention adopts a risk-based approach to the design, development, use and decommissioning of AI systems, which requires carefully considering any potential negative consequences of using them.

CityFibre has completed its acquisition of Lit Fibre (Lit) from Newlight Partners. The share-based acquisition will accelerate CityFibre's nationwide full fibre rollout by up to 300,000 premises as part of its rollout programme and will see Newlight Partners join as minority shareholders.

Node4 has announced a new leadership structure under which Hannah Birch will assume the role of group managing director. The move follows the successful integration of several businesses acquired by Node4 over the past three years, with the company now offering a comprehensive suite of integrated IT solutions and services under a single corporate brand. Node4 Founder, Andrew Gilbert, continues in his role as CEO and Paul Bryce becomes the company's chief experience officer (CXO).

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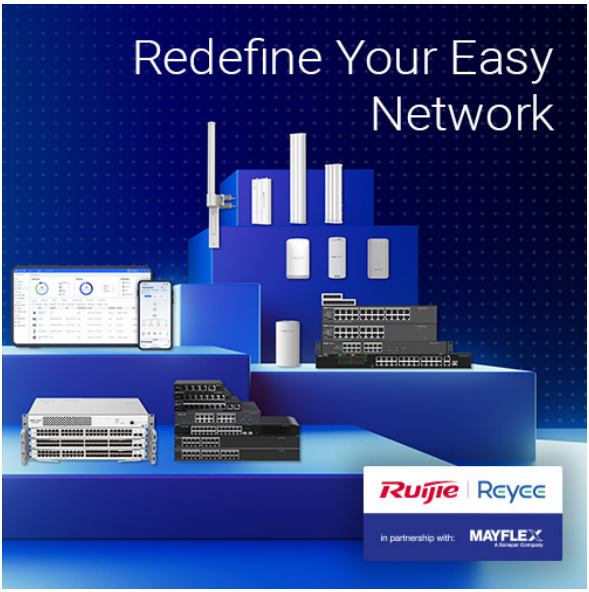

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Kick back and relax and visit the **Mayflex website** to find out more about the games, what's involved and see how you can take part. Why not challenge your colleagues, or your kids! You can even warm up your goalie skills and make your first predictions before the official game commences on 14th June 2024.

For the top 100 players across both games we will also send them a 'limited edition' branded football, so that they can take their skills off the screen and on to the pitch!

Back of the net

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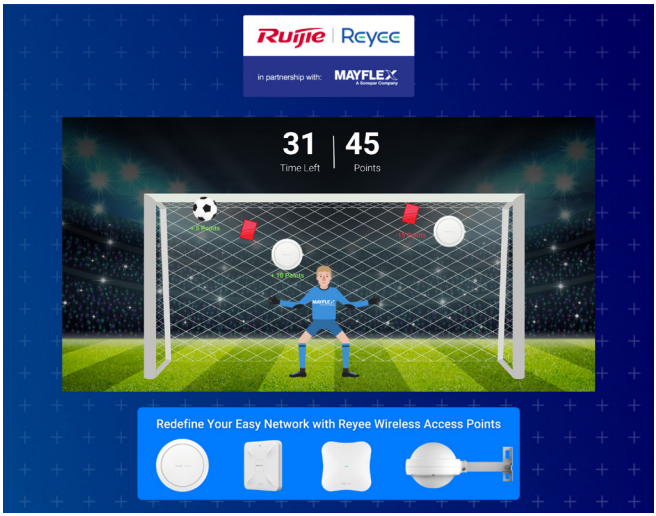
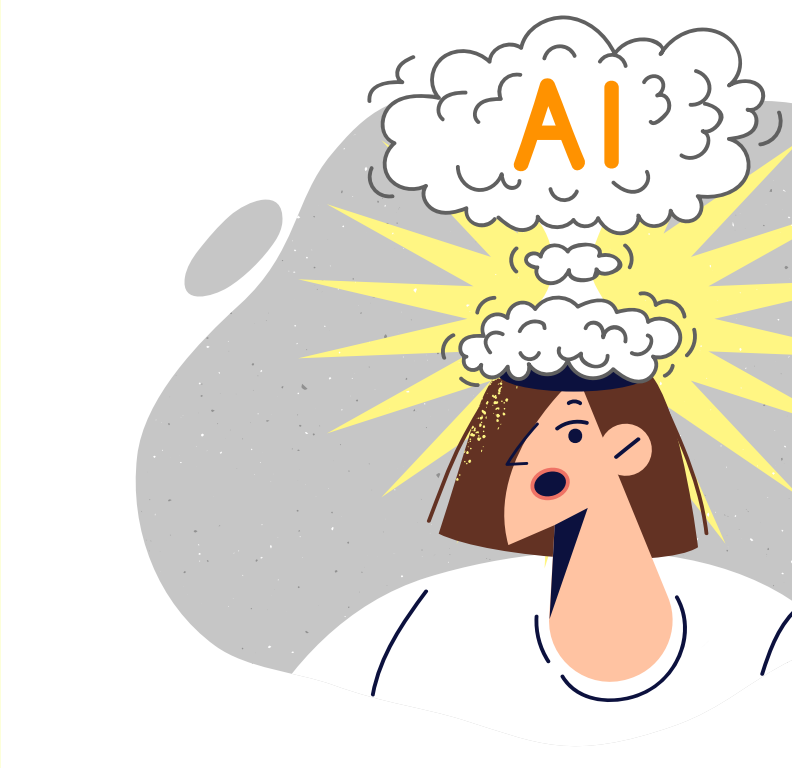


Can data centres cope with the

Hi Rob



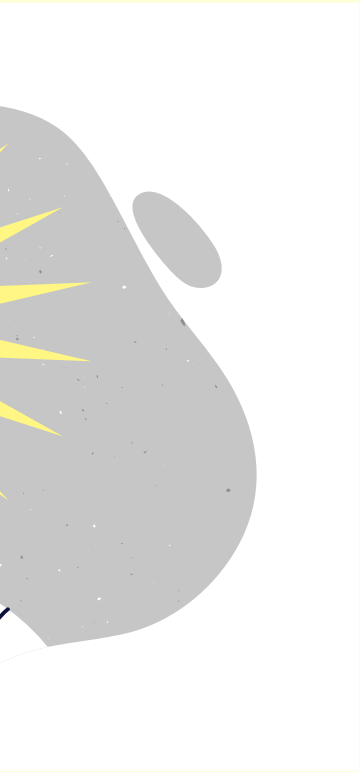
The data centre industry has an imminent problem – the artificial intelligence (AI) explosion is just around the corner. Will data centres, which we currently can't build fast enough, and the existing electrical infrastructure be able to cope with the dramatically increased energy demands of AI? Unless we move to renewable sources of power it seems unlikely.

We are already using AI in our everyday lives – ChatGPT is just the start. However, AI learning requires three times the electricity needed by normal servers. Data centres are now responsible for a colossal 18 per cent of all electricity use in Ireland alone. In Dublin, new data centre builds have now been banned so they can ensure there is still sufficient power for homes in the area. Furthermore, in its Energy 24 report The International Energy Agency (IEA) states that electricity consumption from data centres could double within the next two years. We have no choice but to look at alternatives.

The future holds many challenges and we know working out how to generate, harness and store renewable energy will certainly be one of them. In the not-too-distant future, we envision energy needing to be taken from alternative sources – wind, wave, solar – to power critical loads. Large data centres could need more than 100MW of power to support their loads and they will need to generate their own power through solar PV arrays on the roofs of their buildings, or by using their own wind farms or even harnessing wave power.

The good news is that data centres are starting to act. Reported recently in a strategy to decarbonise operations at

AI explosion?



its Dublin data centres, Keppel DC REIT has signed a 10-year agreement with a Greencoat Renewables to supply 81 per cent of the current power needed over the 10 years of the deal.

The challenge is that, until now, the renewable energy generated needed to be converted into useful AC that uninterruptible power supplies (UPS) can consume. However, what if a UPS could be developed that could accept any sort of renewable energy source – perhaps even one we haven't thought of yet – and accept it directly into the DC bus, thereby avoiding any conversions and therefore losses? Essentially the data centre would have free energy forever to support the critical load and keep the UPS batteries charged.

That is now possible, as over the past four years Centiel has created a new sustainable UPS that has a 30-year design life and has been designed with the future of renewables, such as solar and wind, in mind. There is little doubt that future grid instability and unreliability will need to be corrected using renewables and this next generation UPS technology is ready to meet this challenge. The other challenge many data centres will face in the future relates to lack of space. More compact solutions will be needed with a higher power density to deliver the same capability on a smaller footprint.

We need to recognise how our increased reliance on technology will impact energy use and how AI is about to further accelerate the demands put on data centres. UPS and other associated equipment need to be designed to be flexible and help data centres deal with any changes that come. Those in the data centre sector must work towards a more sustainable future, which we must embrace to cope with the explosion AI will bring.

David Bond
Centiel

Editor's comment

The question posed in the headline is dominating discussions throughout the data centre sector at the moment. As David points out, data centres can't be built quickly enough to cope with impending demand and the amount of energy required to power them in this AI age is truly mind-boggling. Renewable power sources are certainly part of solution and it's good to see that manufacturers are working hard to create products that can maximise their potential.

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Seven up

Wi-Fi 7 is set to positively impact the design and configuration of intelligent buildings. Inside_Networks has assembled a panel of industry experts to explain how this will happen and assess the role network cabling infrastructure plays in maximising Wi-Fi 7's potential

The first of the IEEE 802.11 group of standards was released in 1997 and allowed 2Mb/s of data to be transferred between two devices. Regular improvements and upgrades over the years has culminated in Wi-Fi 7 – also known as IEEE 802.11be.

Numerous emerging technologies, including those introduced in Wi-Fi 6E, are poised to empower Wi-Fi 7 routers and devices to leverage the 6GHz band, alongside the well-known 2.4GHz and 5GHz bands. Wi-Fi 7 will therefore make the use of technology better and faster, particularly in high-density environments such as intelligent buildings.

A Wi-Fi network must be built on the firm foundations provided by a properly designed, specified and implemented cabling system. Wi-Fi 7 has far reaching implications for cabling infrastructure design, as it requires better cabling pathways and end-to-end solutions capable of supporting the access layer switches and uplink connections that are critical to delivering the right capacity for wireless access points.

So what effect will Wi-Fi 7 have on the design and configuration of intelligent buildings? To find an answer, Inside_Networks has assembled a panel of experts to examine the issue and outline the key considerations when specifying a network cabling infrastructure to support it.

WHAT EFFECT WILL WI-FI 7 HAVE ON THE DESIGN AND CONFIGURATION OF INTELLIGENT BUILDINGS? IN ORDER TO MAXIMISE THE POTENTIAL OF WI-FI 7, WHAT ARE THE KEY CONSIDERATIONS WHEN SPECIFYING A NETWORK CABLING INFRASTRUCTURE TO SUPPORT IT AND ENSURE THE BEST LEVEL OF FUTURE PROOFING?

NEYTON AVILA

SENIOR BUSINESS DEVELOPMENT MANAGER AT PANDUIT

The introduction of Wi-Fi 7 (IEEE 802.11be) indicates the speed of change for greatly increased data speeds and bandwidth to cater for the expanding volume of data being generated in every conceivable network application. This is not just a step change – it is a leap forward from the benefits of Wi-Fi 6 (IEEE 802.11ax).

Wi-Fi 7 will open new capabilities for high-bandwidth, high quality applications to the desktop, meeting room, building to building or other targeted environments. After all, less dropped data packets through increasingly low latency and higher quality video feeds means increased productivity!

What we see as we move into this environment of increased user opportunity is if systems designers and corporate infrastructure managers have not considered Wi-Fi 7 for planned implementations, they need to review their plans and start designing their next upgrade, as this technology is a game changer. Our development teams working with the largest networking and communications device manufacturers believe that to reach Wi-Fi 7's potential, every application will require multigigabit switches and high performance Category 6A cable, which is designed to support data rates up to 10Gb/s, as well as power over Ethernet (PoE) capabilities.

It is becoming more important to consider two Category 6A cables per access point (as proposed by IEEE 802,11be), or possibly more, to provide throughput and redundancy for increasingly valuable and higher volumes of data. This should mitigate any situation where a fault or human error takes down a connection, and the system can reroute the data stream with limited, if any, disruption.

Wi-Fi 7 doubles the maximum channel bandwidth available in Wi-Fi 6, offering 320MHz over 2.4GHz, 5GHz and 6GHz. Wi-Fi 7 offers many backward compatibility features, so early adopters will make gains and demonstrate what infrastructure and applications offer the most bang for the buck. To ensure your network is future proof and you have a plan to take advantage of throughput of around 46Gb/s, speak to your network infrastructure specialist.

'WHAT WE SEE AS WE MOVE INTO THIS ENVIRONMENT OF INCREASED USER OPPORTUNITY IS IF SYSTEMS DESIGNERS AND CORPORATE INFRASTRUCTURE MANAGERS HAVE NOT CONSIDERED WI-FI 7 FOR PLANNED IMPLEMENTATIONS, THEY NEED TO REVIEW THEIR PLANS AND START DESIGNING THEIR NEXT UPGRADE, AS THIS TECHNOLOGY IS A GAME CHANGER.'

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MATT POWERS

VICE PRESIDENT TECHNOLOGY & SUPPORT SERVICES AT WESCO ANIXTER

Wi-Fi 7 and its impact on cabling infrastructure design and installation should be fairly limited for most professionals. We've had the standards for distributed building services, defined in EN 50173-6 and ISO/IEC 11801-6, for more than six years, which specifies generic cabling in support of 'non-user specific services'.

Some examples of devices that provide these services could be video surveillance equipment, door controllers, gateways and wireless equipment such as Wi-Fi-7 access points. These standards could be used as standalone infrastructure or in conjunction with space-specific standards of the EN 50173-series, such as EN 50173-2 for office premises.

EN 50173-6 and ISO/IEC 11801-6 introduce the concept of service outlets (SOs) and service concentration points (SCPs) that can connect to equipment or an extension of the cabling. Planning can be made at the individual SO level to ensure a good coverage throughout the building, or by creating a grid structure with groups of SOs or SCPs.

Suggested planning methodology for this is included in an annex of the standard, which recommends an SCP grid size of 4x4m for office deployments to add flexibility and streamline maintenance and operations. Depending on the unique project requirements and supported technologies, the number of SOs could range from a few outlets up to a max of 36 outlets per SCP. The difference with Wi-Fi 7 is that we should be looking at a minimum of two outlets dedicated for access points instead of one. The minimum performance requirement for these links is Class EA.

It should also be assumed that the connected devices at the SOs/SCPs will be utilising standardised remote powering techniques, such as power over Ethernet (PoE), to power the devices. Installation standards, defined in the EN 50174 series and ISO/IEC 14763-2, have a method to calculate the temperature rise in cable bundles with an associated length reduction due to the higher loss caused by the higher temperature. Therefore, new installations should be planned for RP3, which allows any standardised PoE to be used and provides full flexibility and freedom for end users to connect PoE equipment anywhere.

'WI-FI 7 AND ITS IMPACT ON CABLING INFRASTRUCTURE DESIGN AND INSTALLATION SHOULD BE FAIRLY LIMITED FOR MOST PROFESSIONALS. WE'VE HAD THE STANDARDS FOR DISTRIBUTED BUILDING SERVICES, DEFINED IN EN 50173-6 AND ISO/IEC 11801-6, FOR MORE THAN SIX YEARS.'

DOMINIC ROSS

TECHNICAL MANAGER UK & IRELAND AT SIEMON

Wi-Fi is one of many applications that operates over the low voltage cabling infrastructure of an intelligent building, with wireless access points receiving power over that same infrastructure via power over Ethernet (PoE).

Whilst end users are currently in the process of upgrading their corporate office environments to higher-speed Wi-Fi 6/6E, which now delivers wireless speeds of greater than 5Gb/s, the next generation Wi-Fi 7 standard is already in the waiting line. Anticipated to be released later this year, Wi-Fi 7 is expected to deliver actual data rates of <20Gb/s (upstream and downstream combined).

At the same time, demand for outdoor wireless access is on the rise. This makes wireless networks rapidly extend outside of buildings, such as in university grounds or sports stadiums, where higher speed Wi-Fi can now support a much larger volume of mobile devices. To enable wireless networks to reliably support higher bandwidth applications or a greater number of handheld devices, it is critical to specify quality structured cabling and components, and to follow certain design and installation principles.

Firstly, next generation wireless access points require a minimum of 10Gb/s capable balanced twisted pair copper or optical fibre cabling to support higher data rates. To achieve this, network professionals are advised to install Category 6A/Class EA or higher copper cabling or OM3 (or higher) optical fibre. Optical fibre supports extended distances beyond 100m but may require media conversion and/or local power in such circumstances.

To achieve greater than 5Gb/s throughput for Wi-Fi 6 Wave 1 wireless access points and to support future Wi-Fi 7 deployments that enable <20Gb/s, it is important to install two Category 6A/Class EA connections to support redundancy and link aggregation.

To ensure that wireless access points are reliably supplied with power via PoE, shielded cabling should be installed. With remote power delivery leading to increased temperatures in cable bundles, shielded cabling provides greater thermal stability and supports longer channel lengths when deployed in high temperature environments. Lastly, when deploying Wi-Fi outdoors, ruggedised network components to connect wireless access points will ensure that the network will withstand environmental factors, such as moisture and extreme temperature.

> ‘NEXT GENERATION WIRELESS ACCESS POINTS REQUIRE A MINIMUM OF 10GB/S CAPABLE BALANCED TWISTED PAIR COPPER OR OPTICAL FIBRE CABLING TO SUPPORT HIGHER DATA RATES. TO ACHIEVE THIS, NETWORK PROFESSIONALS ARE ADVISED TO INSTALL CATEGORY 6A/CLASS EA OR HIGHER COPPER CABLING OR OM3 (OR HIGHER) OPTICAL FIBRE.’

GARY NEWBOLD
VICE PRESIDENT AT RUCKUS NETWORKS

Wi-Fi 7 is unlocking new capabilities for access points and client devices, mitigating issues like channel overlap and contention that we often saw with Wi-Fi 6. The abundance of channels in the 6GHz band is also reducing interference and enhancing overall network performance and reliability.

Security receives a boost with Wi-Fi 7 due to its implementation of WPA3 encryption in the 6GHz spectrum. Its encryption protocol strengthens security measures against various threats including offline dictionary attacks and vulnerabilities exploited in previous iterations. Moreover, the integration of Wi-Fi 7 and WPA3 across multiple frequency bands facilitates secure and uninterrupted roaming for devices.

Wi-Fi 7 introduces efficiency improvements that are crucial for intelligent building systems. By making use of features like puncturing and multi-link operation (MLO), devices can optimise network interactions, conserving energy and reducing latency.

In essence, Wi-Fi 7's faster speeds, improved security and energy efficiency will revolutionise wireless connectivity for end users. More than that, it will present fresh opportunities for enhancing the design and configuration of intelligent buildings.

Wi-Fi 7 boasts impressive throughput speeds exceeding 1Gb/s. However, to realise these capabilities, it's imperative to deploy cables and access points that can handle such speed and power demands. While Category 5e cables theoretically support speeds up to 2.5Gb/s, real world testing has revealed limitations under load, typically capping at 1Gb/s. Therefore, with Wi-Fi 7 access points featuring port speeds up to 10Gb/s, it is necessary to transition to Category 6A cables. Category 6A cables offer superior high-speed performance, supporting up to 10Gb/s and with a maximum range of 55m.

Additionally, the implementation of Wi-Fi 7 requires consideration of power over Ethernet (PoE). The increased radio spectrum of 6GHz demands more power and this prompts access switches to offer expanded PoE options. Having that higher power is essential for full functionality of Wi-Fi 7 access points, meaning it must match the specific cabling requirements associated with higher PoE options.

Given the speed and power requirements of Wi-Fi 7 access points, it's crucial to align with network infrastructure. This includes verifying that switches supporting the access points can deliver the required speed and power. Moreover, careful management of the total power budget of switches is essential to accommodate all PoE powered devices, not just access points.

'WI-FI 7'S FASTER SPEEDS, IMPROVED SECURITY AND ENERGY EFFICIENCY WILL REVOLUTIONISE WIRELESS CONNECTIVITY FOR END USERS.'

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JULIO PETROVITCH

PRODUCT MANAGER WIRELESS AT NETALLY

Wi-Fi 7 offers faster speeds, better interference avoidance, and thus better performance, for high-bandwidth activities like 8K video streaming, multigigabit file downloads, virtual or augmented reality, and cloud gaming.

Many of the new features included with Wi-Fi 7 are designed to build upon those introduced by earlier Wi-Fi generations, and their main purpose is not only to increase Wi-Fi network speeds, but dramatically decrease latency and increase reliability. To make the most out of these features, the way we design and configure intelligent buildings may have to change:

- 320MHz channel widths double the amount of data that can be transmitted when compared to networks using 160MHz channel widths. Neighbouring access points using smaller channels could interfere with any networks using larger channel widths. You will need to take this into consideration when configuring channel assignments.

- 4096-QAM enables Wi-Fi signals to embed greater amounts of data more densely when compared to the 1024-QAM supported by Wi-Fi 6. The problem though, is that for a Wi-Fi 7 device to be able to use 4K QAM you will need a signal-to-noise ratio of 41dBm or higher. Depending on your environment this may require you to consider adding more access points for denser coverage when designing the network.

- When using multi-link multi-radio (MLMR) two bands can be used concurrently to enable faster speeds through aggregation. However, for MLMR to work properly a fair amount of synchronisation will be required, which could be a problem in busy radio frequency environments. For example, if transmissions in the 5GHz band are delayed by interference, then transmission in 6GHz will be delayed too, which could lower overall Wi-Fi network throughput. This should be considered when configuring the network.

The use of a 2.5Gb/s or 5Gb/s backhaul will be required to support the higher bandwidth supported by Wi-Fi 7 devices. Additionally, power over Ethernet plus (PoE+) – IEEE 802.3at – or higher may be required to support the extra radios and antennas on Wi-Fi 7 access points.

'MANY OF THE NEW FEATURES INCLUDED WITH WI-FI 7 ARE DESIGNED TO BUILD UPON THOSE INTRODUCED BY EARLIER WI-FI GENERATIONS, AND THEIR MAIN PURPOSE IS NOT ONLY TO INCREASE WI-FI NETWORK SPEEDS, BUT DRAMATICALLY DECREASE LATENCY AND INCREASE RELIABILITY.'

PIERS BENJAMIN

EMEA IN BUILDING NETWORKS MARKETING MANAGER AT CORNING

The most fundamental consideration when it comes to supporting Wi-Fi 7 will be the vast increase in speeds and bandwidth compared to previous generations. While Wi-Fi 6E only requires up to 10Gb/s of data, we can expect this to leap up to as much as 40Gb/s when we reach Wi-Fi 7.

When paired with the rise of real time applications that need processing at the edge, we're seeing exclusively twisted pair copper infrastructure challenged from a distance, bandwidth, pathway space and flexibility point of view. While it is possible to connect Wi-Fi 7 with four Category 6A cables, this brings with it a distance limitation of 100m, and the excess of cables leads to congestion and raises infrastructure costs.

Wi-Fi 7 is better served by composite cable, which includes both optical fibre and copper conductors under the same jacket. This leverages the virtually unlimited bandwidth capabilities of singlemode fibre and the powering capabilities of copper to deliver both data and power across distances of over 600m in some cases.

Connecting Wi-Fi 7 can be achieved with one composite cable, taking up much less space and allowing more capacity for future upgrades, as well as reduced maintenance costs. From an environmental perspective, this need for less equipment is also advantageous for operators.

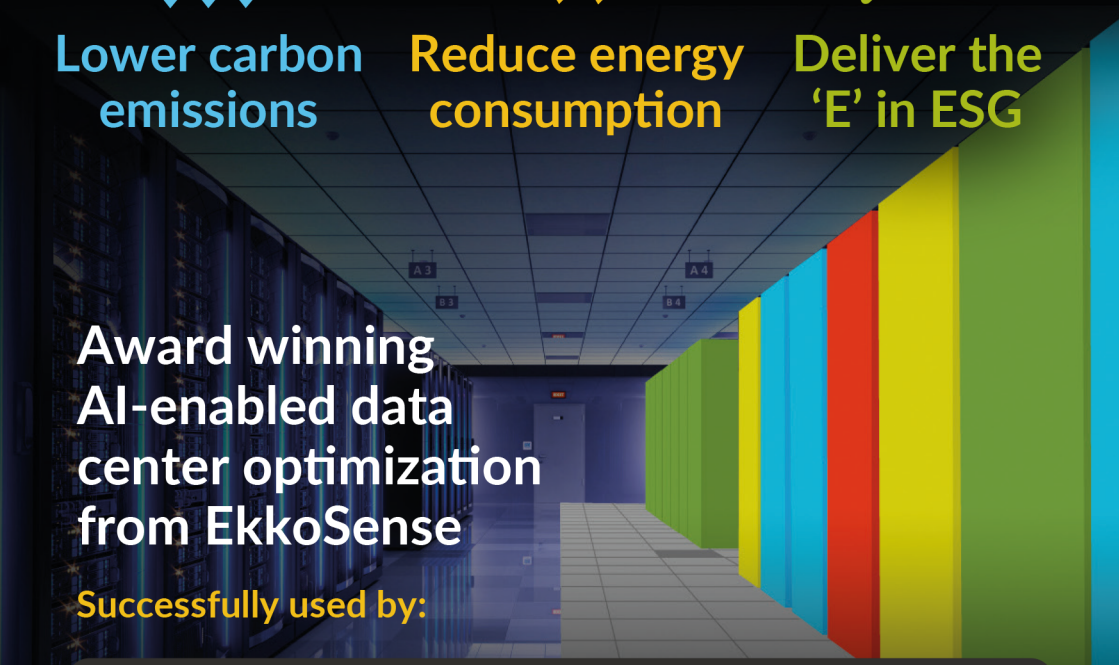
If we choose to stick with long runs of copper cable in the horizonal, we risk continued rip and replacing. Instead, it's better to think about choosing future ready infrastructure that can scale and adapt to not only Wi-Fi 7 but wider changing network needs.

'CONNECTING WI-FI 7 CAN BE ACHIEVED WITH ONE COMPOSITE CABLE, TAKING UP MUCH LESS SPACE AND ALLOWING MORE CAPACITY FOR FUTURE UPGRADES, AS WELL AS REDUCED MAINTENANCE COSTS. FROM AN ENVIRONMENTAL PERSPECTIVE, THIS NEED FOR LESS EQUIPMENT IS ALSO ADVANTAGEOUS FOR OPERATORS.'

Lower carbon emissions

Reduce energy consumption

Deliver the 'E' in ESG



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Artificial intelligence is currently estimated to account for two per cent of the sector's total power use and Uptime Institute predicts this figure will skyrocket to 10 per cent by 2025. However, AI can be part of the solution. AI technology utilised at a Frankfurt data centre moderated cooling loads and adjusted energy use according to the weather, increasing the facility's efficiency by nine per cent.

Baseline your energy usage so you can accurately measure savings – the starting point towards making a positive change. After all, you can't manage what you don't measure. This leads to benchmarking your facility with other data centres so you can compare how you're doing and share tactics.

Capacity management surveys suggest that up to 30 per cent of servers aren't useful yet consume electricity 24/7. Figures from Uptime Institute show decommissioning a single unused server could save $2,500 in energy, licenses and maintenance costs annually.

Disaggregation is the decoupling of different resources so they can be housed separately and deployed individually, as and when required. Concerns around cost, security and compatibility still need to be overcome to maximise the opportunity for flexibility and positive environmental impact.

Electrification and decarbonisation are often thought to mean the same thing but there's a difference. Decarbonisation is reducing our dependency on carbon-based fuels, achieved by switching to renewable energy sources like solar, wind, hydro and geothermal. Electrification is replacing technologies that use fossil fuels with technologies that run on electricity – one of the most important strategies for reducing CO2 emissions from energy. It also has the potential to be globally inclusive, as regions that need

r the digital infrastructure industry looms in a bid to reduce emissions by 55
030 in line with the Paris Climate Agreement. With the pressure on for the
ome more sustainable, CNet Training's Pat Drew shares his A-Z of terms,
d initiatives that are helping the industry fight the rising tide

extensive development often have the best conditions to support renewable energy options.

Factor X is a way of utilising metrics on various activities that can reduce the throughput of resources and energy in any given process. For the data centre, by what factor can – or should – energy and water consumption be reduced? The aim is continual improvement, so any answer to this question is preliminary, with further improvements being the goal as our experience and understanding grows.

Guarantees of Origin (GOOs) or Renewable Energy Guarantees of Origin (REGOS) concern where renewable energy is purchased directly from suppliers under a contract evidencing that electricity has been generated and delivered to the grid from a renewable energy resource. In January 2021 the European Union (EU) ceased to recognise UK REGOs and the UK government stopped recognising EU GOOs from April 2023.

Hydrotreated vegetable oil (HVO) is made from animal fats and crops such as rapeseed. Although frequently billed as a carbon neutral fuel source as it reduces emissions, there's an environmentally destructive element and so doesn't align with any sustainability initiative.

Investors increasingly take environmental, social and governance (ESG) factors into account when making investment decisions. Organisations prioritising sustainability are more likely to attract investment from socially responsible investors and funds that are focused on ESG. These investments provide the opportunity for research and innovation, both of which contribute to faster growth and development.

Justification for investing in sustainability? No longer a choice, rather a necessity for any successful business strategy, the benefits of sustainability are clear. Companies that fail to embrace this approach risk falling behind the curve. By adopting sustainable practices, businesses can reduce costs, mitigate risks, innovate, differentiate themselves, and attract and retain top talent. The business case is powerful – it's up to companies to act.

Knowledge is key to unlocking opportunities to make progress towards reducing wastage and improving sustainability. Look for industry recognised certifications and qualifications, delivered by trusted providers.

Living walls are being introduced to encourage biodiversity in urban locations. Vegetation also absorbs heat in hot weather and insulates the building in cold weather, reducing the need for heating/cooling.

Microgrids are resilient energy systems that serve a geographic footprint, such as a campus, business centre or neighbourhood. They provide back-up power during outages, reduce reliance on the grid and enable the use of renewable energy sources. They've been around for a while but, until recently, were dependent on fossil fuels to generate power. More recently, the cost of solar panels and battery storage has fallen, making sustainable microgrids an economic reality.

Net zero is where the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere. In 2019, the UK became the first major economy in the world to legislate a binding target to reach net zero emissions by 2050.

Optimisation can be achieved by regular maintenance and fine-tuning of systems to ensure they operate at peak efficiency. This is essential in minimising wasted energy.

Power purchase agreements (PPAs) are a long-term commitment that can offset a large proportion of an operator's footprint. Digital infrastructure has become the largest global consumer of PPAs. Partnerships come in many forms – transactional, complementary and collaborative – but what we really need is successful transformational partnerships with common goals, shared accountability and risk management, and good leadership. They consider the different skills, roles and responsibilities needed and have a clear understanding of the mutual benefits that can be achieved.

Quantum computing is a way off mass adoption but we're edging closer due to swift advances in technology that could help achieve big sustainability targets. Energy providers are starting to turn to quantum computing to deliver energy more efficiently by optimising the output of decentralised infrastructure, securing a more sustainable supply of electricity for the future.

Renewable energy commitments see operators collaborating with named energy providers to guarantee customer energy use is 100 per cent matched by an equivalent supply produced by that specific facility.

Self-generation is being explored by data centre operators via on-site solar photovoltaic panels or wind turbines to increase their independence from the grid. Surplus energy can be retained in battery storage systems and accessed during a time of critical need or sold back to the grid.

Triple bottom line is an accounting framework made up of three components – people (community, education, health, wellbeing), planet (environmental impact)

and profits (bottom line, cashflow). The aim is for businesses to measure their social and environmental impact as well as profit generation.

Uninterruptible power supply (UPS) systems can be leveraged to provide grid balancing services. During times of excess electricity supply, a data centre can temporarily switch to its back-up power source and feed surplus energy back to the grid, effectively acting as a distributed energy resource – not only benefiting the grid but also generating revenue for the operator.

Virtualisation is achieved by consolidating physical servers into virtual machines. This allows you to achieve fewer physical servers, higher server utilisation rates and reduced energy demands to power/cool your hardware.

Waste energy from data centres is being used to heat homes, swimming pools, schools – even a trout farm in Norway. This mutually beneficial, circular energy model is an actionable solution with multiple benefits including reusing waste energy, reducing energy bills and a lower carbon footprint for both organisations.

X-66 is an undoubtedly tenuous link, however, this innovative aircraft, being developed by NASA and Boeing, is paving the way for net zero emissions air travel by 2050. If there's one industry that gets as bad a rap for being as unsustainable as data centres, it's aviation – so if they can do it, so can we.

Younger generations of workers are driving the sustainability agendas in many organisations. Research by talent solutions consultancy Robert Half found 47 per cent of 18-34-year-olds would look for a new role if they thought their organisation wasn't doing enough on ESG issues, such as reducing carbon emissions. Sustainability and energy management is not just about 'being green', it's also becoming essential for recruitment and retention.

Zero Emission Generators (ZE-Gen) is an initiative being developed by the Carbon Trust and Innovate UK, backed by major investment from tech companies. It aims to replace millions of costly, carbon emitting fossil fuelled generators, accelerating the transition to renewable energy-based alternatives. ■

PAT DREW
Pat Drew is an instructor at CNet Training, delivering the Level 5 Certified Data Centre Sustainability Professional (CDCSP) program from CNet Training's Global Digital Infrastructure Education Framework. He is passionate about helping organisations to create sustainability strategies and business implementation plans for transformation towards a credible sustainability lifecycle.

It's time to get read

Passionate about innovation and quality, Centiel's award winning team designs, manufactures and delivers industry leading critical power protection solutions

According to Electricity 2024, a report from the International Energy Agency, electricity consumption from data centres, artificial intelligence (AI) and the cryptocurrency sector could double within the next two years.

The report goes on to state, 'After globally consuming an estimated 460TWh in 2022, data centres' total electricity consumption could reach more than 1,000TWh in 2026. This demand is roughly equivalent to the electricity consumption of Japan. Updated regulations and technological improvements, including on efficiency, will be crucial to moderate the surge in energy consumption from data centres.'

It's a case of supply and demand. Although energy prices have come down recently with demand set to rise dramatically, so will costs. There is no doubt that soon, we will see offices, data centres and homes needing to generate their own energy through renewable sources purely to reduce cost.

According to forecasts in the Energy 24 report, 'Renewables are set to provide more than one-third of total electricity

dy

centiel
continuous power availability

generation globally by early 2025, overtaking coal.'

For the first time in history, pressure to adopt a sustainable approach using renewable energy sources and the need to save money go hand-in-hand.

The good news is that there are significant advances in technology to support increased need. One brilliant example is ultralight fabric solar cell technology developed by the Massachusetts Institute of Technology that can quickly and easily turn any surface into a power source. Durable, flexible solar cells, which are much thinner than a human hair, are glued to a strong, lightweight fabric, making them easy to install on a fixed surface.

The fact is that we don't know what the future holds in terms of innovation. What we do know is that we will need better ways to harness renewables, keep electricity costs down and become more sustainable – all at the same time. Any technology deployed must be flexible enough to be able to adapt and accept different energy sources – some of which may not have even been invented yet.

Data centres will also need to be designed from the outset to maximise energy efficiency. Flat roofs can be used to take advantage of solar energy. There even may be space for wind turbines in large grounds.

From an uninterruptible power supply (UPS) perspective, Centiel has already taken significant steps to support the need to reduce energy use. Our sustainable modular StratusPower UPS offers the highest levels of availability and has on-line efficiencies close to 98 per cent.

Uniquely, Centiel's StratusPower has already been designed with the future use of renewable energy, such as solar and wind, in mind. Currently, mains AC power is rectified to create a DC bus that is used to charge batteries and provide an input to an inverter. But what about a future where the DC bus can simultaneously deliver power with other energy sources? There is little doubt that future grid instability and unreliability will need to be corrected by the use of renewables and StratusPower is ready to meet this future.

With AI and the blockchain sector set to accelerate electricity use exponentially, data centres need to act now to reduce power consumption. Harnessing renewable energy sources will future proof businesses and Centiel's expert team of trusted advisors can work together with data centres to advise about how to achieve this using the most efficient UPS systems while carefully managing total cost of ownership, avoiding risk and not compromising on availability. Be ready.

For more information, or to arrange a no obligation evaluation and have a discussion about the best UPS to protect your organisation's critical power, CLICK HERE.

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Quality control

Jorlan Peeters of HyTEPS identifies the smart route to optimising data centre Power Usage Effectiveness (PUE)

Over the years, data centres have grown from a handful of servers to hundreds, thousands and even hundreds of thousands of servers in one location. Such configurations can substantially affect the grid and other users in a region. Over the years, industry-wide data centre workloads have increased eightfold, yet total energy consumption has remained virtually the same. Even so, data centres consume a significant amount of electricity.

ENERGY FLASH

PUE identifies the total amount of energy used by data centre computing equipment. A lower PUE means more of the energy is used for computing, as opposed to secondary processes such as cooling or security.

There are quite a few reasons data centres need to optimise PUE. As part of the global push towards sustainability and reducing climate change impacts, they need to reduce environmental impact and cut greenhouse gas emissions. Improving PUE supports corporate social responsibility (CSR) initiatives and compliance with increasing regulatory and reporting pressures. Reducing electricity demand for non-computing functions such as cooling, lighting and power conversion also brings substantial savings. This is important, as energy costs represent a significant portion of a data centre's operational expenses.

As demand for data centre services grows, the need to add computing power also increases. Optimising PUE helps scale operations without a proportional increase in energy consumption. What's more, lower PUE values can bring a competitive advantage and differentiating factor in a market where clients are becoming more environmentally conscious.

HOW TO OPTIMISE PUE?

Optimising PUE can involve various strategies and technologies. For example, reliance on energy intensive cooling systems can be reduced by using outside air or water sources, liquid cooling, immersion cooling or hot/cold aisle containment. Using virtualisation technology to run multiple virtual servers on single physical server can maximise the utilisation of IT equipment, reducing the number of servers needed.

However, I'd like to take a closer look at the role of power systems in

improving PUE. Losses can be reduced by deploying more efficient uninterruptible power supply (UPS) systems and optimising voltage distribution systems. At the same time, DC power distribution may reduce energy conversion losses typical in AC systems. You can also implement software and hardware solutions that dynamically adjust power usage based on workload, for example, powering down idle components.

POWER RANGER

Inspansion means increasing the capacity of an existing installation through smart measurements and effective measures. It is key to the efficient, cost-effective, sustainable utilisation of electrical power, as well as optimal grid interfacing. This approach entails working out where there are inefficiencies in power usage and distribution, and finding ways to resolve them. Through inspansion, capacity can be created behind transformer(s) in electrical installations. In this way, more yield can be obtained from existing systems in a safe, smart and sustainable way.

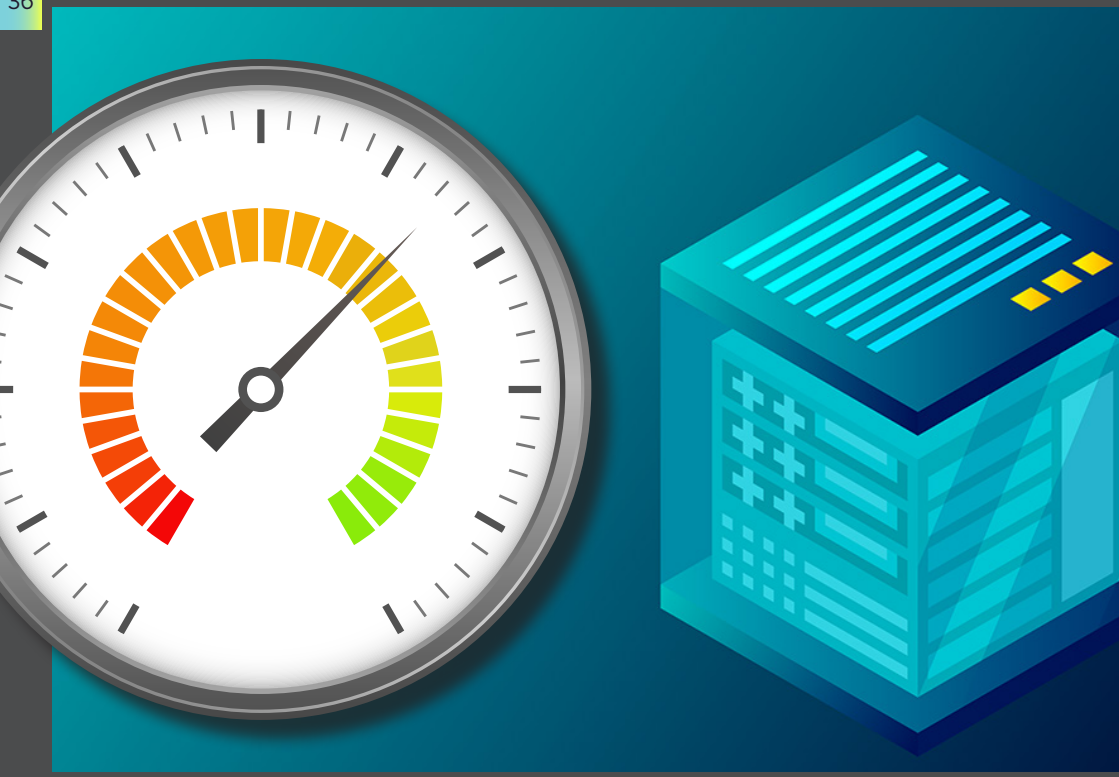
The quality of voltage and current plays an important role in this. By removing

'Power quality plays a significant role in improving PUE by ensuring that the electrical power supplied to the data centre is stable and efficient. This directly impacts energy efficiency and operational reliability of IT equipment and the supporting infrastructure.'

power quality phenomena such as harmonic pollution, inductive and capacitive reactive power and by load balancing, existing installation capacity can be freed up and used much more efficiently.

Keeping power quality in order is essential in other areas, too. Good power quality helps avoid increased wear and tear on IT equipment and power infrastructure, increasing lifespan and operational efficiency. Increased heat generation in equipment can be avoided, along with voltage fluctuations that cause devices to operate outside optimal efficiency ranges, increasing power consumption and reducing effectiveness.

Issues like voltage sags, swells, harmonics and flickers can cause inefficiencies in power distribution and conversion systems within a data centre. By improving power quality such losses can be minimised, leading to a more efficient use of energy



and a lower PUE. This also makes it possible to efficiently incorporate renewable energy sources such as solar, wind or hydroelectric power to supply a portion of a data centre's energy needs.

PROACTIVE APPROACHES

Through mitigation measures such as active filtering, reactive power compensation and other proactive approaches, it becomes possible to maintain excellent network performance. The key is to look at the system as a whole. What is the quality of voltage and current? What is the grid doing? What causes fluctuations? What harmonics are injected? How do components affect each other?

Monitoring and analysis are key to helping uncover usage patterns and hidden issues, while identifying possible improvements. In this way, data centres can hit their targets and keep improving without affecting key processes. Adjustments can be made with absolute certainty equipment will keep working without downtime. By zooming in and mapping complex relationships between devices and components, data centres can make informed adjustments, track the sources of unexpected measurements and implement durable, effective remedies.

ROLE PLAY

Power quality plays a significant role in improving PUE by ensuring that the electrical power supplied to the data centre is stable and efficient. This directly impacts energy efficiency and operational reliability of IT equipment and the supporting infrastructure. Power quality is a foundational aspect of data centre operations that directly influences PUE by impacting energy efficiency, equipment reliability and operational stability. Through expert measurements, analyses, simulations and improvements, data centres can achieve lower PUE values, resulting in considerably more sustainable and cost-effective operations without vast investments in electrical system capacity. ■

JORLAN PEETERS

Jorlan Peeters studied accounting and business management at Maastricht University, and formerly worked at Schneider Electric and Spie Oil & Gas Services. Peeters is a certified electrical engineer in high and low voltage and spent 15 years with IEC working on EN 50160. Besides his current position as managing director at HyTEPS, he lectures at Eindhoven University of Technology and HIT Avans University of Applied Sciences.

Joined up thinking

Ajay Kareer of Harting takes a look at the need for reliable, energy efficient connectivity solutions in data centres

The worldwide data centre market is experiencing explosive year-on-year growth as our reliance on remote working, artificial intelligence (AI) and the internet of things (IoT) increases at a staggering rate. In addition, the changes to our working lives caused by Covid-19 have meant that businesses and individuals need reliable access to data to allow them to embrace flexible ways of working. Therefore, as we become more reliant on remote or hybrid working models, it's essential that data centres run as smoothly and efficiently as possible.

OUT AND ABOUT

Data centre power outages can happen for various reasons such as weather conditions, network failures, human error and software issues. However, they can also occur due to power infrastructure problems created inside the data centre from either generator, uninterruptible power supply (UPS) or power distribution unit (PDU) failures.

The International Data Corporation reports that energy consumption per server is growing by around nine per cent per year globally. Despite servers getting more compact to save installation space, their improved performance increases their energy requirement. As a result, energy consumption costs can be more than 50 per cent of the total data centre operating expenses (OpEx). It's therefore essential to invest in and manage each part of the critical infrastructure in the data centre to ensure energy efficiency and reliability.

One method of improving energy reliability is by using 'plug and play' connectors and pre-assembled cable assemblies that can reduce maintenance downtime by removing the element of human error. They also reduce the overall cost of ownership when compared to hardwired connections.

SURE THING

Cable assemblies distribute power from the data centre's UPSs to the PDUs and consist of a cable between one or two connector hoods. Inside the connector is an insert or multiple inserts where the conductors from the cable are terminated. The connector hoods then mate with a matching housing wired to the PDU and/or UPS.

When a cable assembly is designed and manufactured using automation, human error is massively reduced. If the same connections are handmade or field wired, the chance of error increases – potentially risking catastrophic issues either during the initial power-up or during the operation of the data centre. This, in turn, can result in hours of expensive skilled labour spent troubleshooting, as well as the downtime costs of the rack, PDU or entire data hall not functioning.

If designers hardwire the conductors inside the cable, a skilled electrician is needed to disconnect and reconnect the hardwired PDU. Using cable assemblies means there is no need to hire an electrician and, since everything is pre-wired and pre-tested, wiring errors are virtually eliminated. Cable assemblies also offer benefits during the design and prototype phase and make access for maintenance easier.

COUNTING THE COST

As energy costs can account for more than 50 per cent of the total OpEx of a data centre, one important ongoing challenge is to improve the energy efficiency of its infrastructure. To calculate the exact effect of power usage from connectors in data centres, Harting has compared the power consumption of three different connector solutions in its independently accredited test laboratory. One of the connectors tested was a Harting product and the other two were CEE (IEC 60309) plugs from different manufacturers.

The results showed that the Harting connector reduced power wastage by up to 50 per cent, compared to the other two brands of IEC connectors, by using low impedance contacts. These contacts reduce the power lost in connections and significantly improve the Power Usage Effectiveness (PUE) of data centres.

Depending on the electricity price, which differs regionally and worldwide, different monetary gains can be realised. As an example, one hyperscale data centre with 15,000 racks can achieve annual power consumption savings of around £90,000.

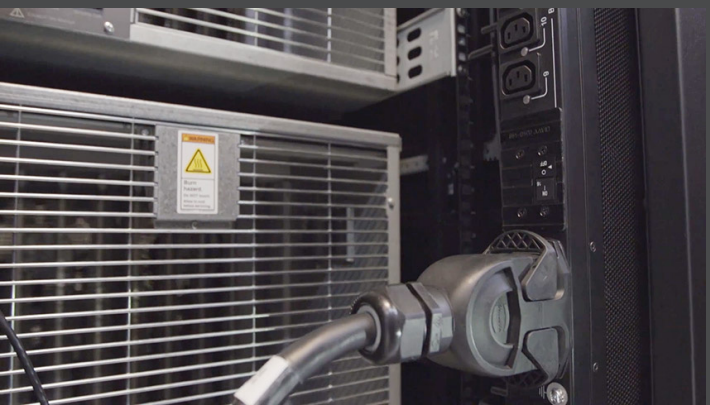
‘Cable assemblies distribute power from the data centre’s UPSs to the PDUs and consist of a cable between one or two connector hoods. Inside the connector is an insert or multiple inserts where the conductors from the cable are terminated.’

These calculations are based on the average European Union industrial prices from 2020, so potential savings will be even more dramatic when we consider how much energy prices have increased over the past four years.

AN OPEN AND SHUT CASE

The Open Compute Project (OCP) is focused on the redesign of hardware technologies for IT infrastructure. Its goal is to make data centres more efficient, more flexible and more quickly scalable via an open exchange of ideas, specifications and other intellectual property to maximise innovation and reduce the complexity of technical components.

In a data centre, power shelves provide power to IT equipment. The Rack & Power Project Group within the OCP is focused on standardising racks and making them easier to integrate into the data centre infrastructure. These designs, called Open Rack, began worldwide installation at the beginning of 2023.



As a lead author and initial connector partner in the standardisation process, Harting has now developed the third version of the Open Rack (ORV3), called the ORV3 OCP input power connector. In line

with the OCP's goal of optimising efficiency in the construction and scaling of data centres, it enables a more compact design for the entire infrastructure thanks to its shallower rack system.

SMART THINKING

As we have seen, reliability, ease of use and efficiency are key themes when it comes to data centre energy management. Connectivity technology is constantly being refined and developed, and new smart connectivity solutions are designed to improve safety, identify faults and ensure systems within data centres are working efficiently.

One of the most important additional functions powered by smart connectivity is the signalling of the mating state. The mating state can indicate a range of different parameters, including if the connector is electrically connected and whether it is mechanically locked. It can also indicate if the connector is overloaded and monitor whether environmental parameters such as temperature and humidity are within a permitted range.

The plug-in status is indicated by means of a light. In its simplest case, a red or green display shows whether a fault is present. Modern full colour LEDs can denote other states, such as the presence of voltage. A digital interface within the connector then transmits the information in much greater detail to a control centre.

SEEING IS BELIEVING

Connectors are currently identified by using electrical contacts as coding pins, with the control system determining which attachment is plugged in. However, this method has its limits, especially with large flexible systems. The latest solution identifies the connector with the help of a bus system and microcontroller or, alternatively, via near field communication (NFC). This gives each connector a unique identification, which is assigned to the corresponding attachment or tool. As a result, even simple components such as lamps, door contacts or analogue sensors can be identified. ■

AJAY KAREER

Ajay Kareer is data centre market manager at Harting. After completing his degree Kareer worked in solution design and system sales in the automation and intralogistics industries. In 2022, he moved to Harting to support customers with bespoke interconnectivity applications in the everchanging and fast evolving data centre market.

Colt Technology Services creates two new sustainability programmes

Colt Technology Services has formed two new sustainability programmes to support its own net zero goals and contribute to those of its customers. Colt is partnering with Urban Miners to extract precious metals from unused equipment and is collaborating with Supercritical to deliver a customer programme built on carbon removal credits.


Caroline Griffin Pain

In a recent pilot programme in Sweden, 99.4 per cent of Colt's equipment was either recyclable or reusable, amounting to 8.7 metric tonnes in weight and enabling 19 tonnes of CO2 savings. Colt is now extending the pilot with Urban Miners to analyse and extract precious metals from its hardware in France, Germany, Italy, Spain and the UK. Colt is also partnering with Supercritical to invest in vetted carbon removal initiatives. Colt customers will be able to count a share of these carbon removal credit purchases towards their carbon removal climate targets in their sustainability reporting.

Caroline Griffin Pain, chief legal officer at Colt Technology Services, said, 'Our research has shown us that understanding and reducing the impact of digital infrastructure on the environment are critical priorities for global IT leaders. We have an opportunity and a responsibility to influence these goals.'

Jon Wilner rejoins Allied Telesis to lead customer success

Allied Telesis has reappointed Jon Wilner as vice president of customer success. He rejoins the company to build new service programmes dedicated to enhancing the customer journey. Wilner worked at Allied Telesis for 10 years between 2005-2015 and most recently served as general manager of operations at Cognizant.


Jon Wilner

'I am thrilled to be back working with such a strong global support team at the top of their game in professional and managed services and solutions engineering,' said Wilner 'There is nothing more important to Allied Telesis than customer relationships and we are laser focused on innovating our solutions to their changing needs.'

EuJin Lim, president at Allied Telesis, added, 'I am very happy that Jon has rejoined Allied Telesis. With his forward-thinking leadership and commitment to the client experience, our customers will experience a more exceptional level of growth and success than ever before.'

Cohesity appoints Craig Martell as chief technology officer

Cohesity has appointed Craig Martell as chief technology officer. In this role, he will use his deep industry expertise to shape the company's technical vision, incorporating current and evolving industry and customer trends to define and execute a strategic and impactful roadmap for the company's future.

Martell brings expertise in artificial intelligence (AI) and machine learning, leading AI programs for top tech companies since 2013. He most recently served as the chief digital and artificial intelligence officer (CDAO) for the US Department of Defense (DoD). In this role, he served as the senior official responsible for accelerating the adoption of data, analytics, digital solutions and AI functions to generate decision advantage across the department.

'The speed and scale Cohesity has achieved over the last several years is testament to the incredible technology platform the company has built at the junction of multicloud, security and AI for the future of data protection,' said Martell. 'My role will be to accelerate the innovation internally and the advocacy externally of Cohesity's AI-powered innovations that are second to none.'

CHANNEL UPDATE IN BRIEF

Zayo Group has announced steps to carve out two independent entities. One will consist of Zayo's European business and the other will encompass its business that manages customers' global network needs outside of its core North American and European networks. The separations will provide flexibility to capitalise on unique growth opportunities, simplify operations and align strategic and business objectives to drive long-term value for Zayo, its customers and the newly independent entities.

Eaton has opened a new state-of-the-art campus in Helsinki to boost its capacity to manufacture and supply uninterruptible power supply (UPS) systems.

Spirent Communications and Aviz Networks are collaborating to offer customers more open, hardware vendor agnostic methods for conducting intelligent traffic monitoring across various 5G network applications such as voice, video, data, mission critical services, the internet of things, and enterprise and industrial applications.

Rutronik Elektronische Bauelemente and Cherry Embedded Solutions have concluded a distribution agreement for the whole of Europe. As a result, Rutronik is expanding its product portfolio of Rockchip-based system-on-modules (SoM) and single board computers (SBC) for professional and industrial customers in the future markets of robotics, digital healthcare, smart displays and intelligent video surveillance.

Quick clicks

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

Quantum Key Distribution (QKD) And The Role Of Optical Circuit Switching In Secure Networking is a blog by Rohit Kunjappa of **Huber+Suhner.**
CLICK HERE to read it.

A Path to Sustainable Building Operations is report by **Frost & Sullivan** that provides a ch and framework to help you build a winning environmental, social and governance (ESG strategy.
CLICK HERE to download a copy.

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

The latest Egress Email Threat Landscape 2024 report from **Northdoor** has uncovered a concerning surge in phishing attacks, with 94 per cent of companies falling victim in the past year. **CLICK HERE** to download a copy.

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Openreach first used a drone deployment to help install the cable for a new fibre to the premises network near Pontfadog in Wales in late 2017. A year later the drone team used drones to fly broadband cable across a river to reach a remote property in the Scottish Highlands. **CLICK HERE** to see a video about it.

Rethinking Smart Buildings In The Age Of AI is a podcast by the **Association for Smarter Homes & Buildings (ASHB).** **CLICK HERE** to listen on Spotify.

Resolutions, Yoga And Green IT: The Top 5 Pitfalls Of Sustainability is a blog by Kevin Brown of **Schneider Electric.** **CLICK HERE** to read it.

Work in progress

James Withey, liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3, offers insight into the intricacies of developing ISO/IEC generic structured cabling standards

In the intricate web of modern communication systems, structured cabling stands as the unifying force that enables seamless connectivity across diverse networks. From office buildings to data centres, and from industrial premises to stadiums and our homes, structured cabling forms the backbone of telecommunications infrastructure, supporting the transmission of data, voice and multimedia signals.

SETTING THE STANDARD

Amidst this complexity, adherence to standardised practices is essential to ensure interoperability, reliability and performance. Organisations like the Telecommunications Industry Association (TIA), the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) all develop and publish generic structured cabling standards, providing guidance and requirements for the design, installation and maintenance of robust cabling systems. But how do these standards get started, and how do they get developed before they come into force?

It's easy to look at something that has already been developed and say the answers seem obvious. However, in many cases cabling standards involve new technologies, often with stakeholders presenting competing technologies, and sometimes with only prototypes that have yet to be proven as interoperable. This means the development process is both time-consuming and complex, and involves many stages of drafting and review before industry consensus is reached – with most standards taking several years to complete.

Timelines and draft terminology

Throughout the ISO/IEC standards development process, specific terminology and is used to identify the various stages of progression from initial drafts to final publication.

- Committee draft (CD).
A preliminary draft of a standard circulated within the technical committee for review and comment.
- Committee draft for vote (CDV).
A draft standard that has undergone committee review and is ready for formal voting by member countries.
- Final draft international standard (FDIS).
The final draft of a standard submitted for approval by member countries before publication as an internationa
- International standard (IS).
A published standard that has undergone approval by member countries and is recognised as an international benchmark for best practices.

BEGIN AT THE BEGINNING

The development of cabling standards

follows a meticulous process governed by the organisations involved. Although there are some variations in the processes between these organisations, all involve collaboration among technical committees, working groups and panels made up of stakeholders representing companies providing the products and services that cover all aspects of the industry.

Experts in connector and cable design work with installation experts, system integrators, building design consultants and safety regulators, who contribute their individual expertise and particular focus. This is why finding the common ground is both the challenge and the opportunity. Once the standards committee has been formed with its membership of industry experts, they are then able to work on a project, which begins with the coming up with identification of the need for a new standard.

I'VE GOT AN IDEA

The journey begins with the identification of the need for a new standard or a revision to an existing one. This critical stage is often driven by technological advancements, changes in industry practices or emerging requirements for performance and reliability – for example, a new data rate or powering level.

Industry stakeholders, national committees and regulatory agencies may submit proposals to initiate the development process, but however the project is proposed, it always ends up with a vote by the members of the group to decide to whether work on that standard – or not!

The time between the first discussion of the proposal to the point where the project is approved is influenced by both the rules of the organisation, which can dictate minimum time for voting cycles and also the cadence of scheduled meetings. Depending on the complexity of the project, this can be anywhere between a couple of months to up to a year, as sometimes the group needs to complete additional work to be able to evaluate a proposal.

Update: ISO/IEC 11801

An amendment to ISO/IEC 11801-1 has reached the final voting stage, which will add three new classes of single pair cabling providing support of Single Pair Ethernet applications like IEEE 10BASE-T1L, which can provide throughput of 10Mb/s at a reach of 1000m, as well as range of remote powering options.

In parallel work, the technical report ISO/IEC TR11801-9911 will provide guidance for running these single pair applications over the existing four pair cabling classes D through 8.2. In addition, it has been agreed that passive optical networks (PON) may also be supported by 11801 cabling and this will be added to a future revision.

THE REAL WORK BEGINS

Upon approval of a proposal, working groups, the backbone of the development process, embark on an iterative process of researching and drafting to give shape to the envisioned standards. These groups conduct comprehensive reviews of existing standards, industry best practices and

Update: ISO/IEC 30129

An amendment is in progress to update ISO/IEC 30129, which will update the requirements and guidance for telecommunications bonding networks for buildings and other structures.

'Through the meticulous efforts of technical committees, working groups and stakeholders, ISO/IEC standards pave the way for a connected world, where communication knows no bounds. The participation of a diverse range of stakeholders throughout the standards development process ensures that standards reflect the needs, priorities and expertise of the global community.'

Update: ISO/IEC 24383

ISO/IEC 24383 is being developed to provide requirements for physical network security, including guidelines for security planning, security systems, intelligent building systems and administration systems of customer premises.

The standard will provide guidance regarding multiple levels of security, starting with that given by ISO/IEC 14763-2, and moving to restricted, secure and highly secure levels of security.

emerging technologies to inform the drafting process. Through collaboration via face-to-face meetings, teleconferences and electronic communication platforms, working groups meticulously formulate technical specifications, performance requirements and testing methodologies to address the evolving needs of the industry.

Armed with feedback from stakeholders, working groups embark on the arduous task of revising the draft standards to address comments and concerns. This iterative process of revision and consensus building may involve compromise, negotiation and diplomatic finesse to reconcile conflicting viewpoints and achieve widespread acceptance. Working groups strive to strike a delicate balance between the diverse needs of stakeholders, while maintaining technical rigor and alignment with international best practices.

This stage of consensus building is often the longest, and while simple projects with global alignment on technical solutions may move to the voting stages as quickly as within a single six-month meeting cycle, most will move through a series of drafts, each with a round of comments, discussions and resolutions that takes about two years to finalise. With larger projects, or ones where there are difficult technical issues to resolve, this may extend a project by several more years before it reaches the voting stages.

RATE AND REVIEW

Once the initial drafts take shape, they can undergo a public review and comment period to solicit feedback from an even broader range of stakeholders. The draft standards are made available for public review on the ISO and IEC websites, as well as through national standards bodies and industry organisations.

Interested parties are encouraged to submit comments, suggestions and critiques to improve the clarity, accuracy and relevance of the standards. Once consensus is reached and all comments are addressed, the final drafts of the standards are submitted for approval by the relevant ISO and IEC member bodies.

The standards undergo a formal voting process, during which member countries and organisations cast their votes to

Update: ISO/IEC 14763

In support of the new single pair classes, the planning and installation standard ISO IEC 14763-2 is being revised to cover the new lengths, connections and remote powering capabilities offered by Single Pair Ethernet.

Another major project is to write ISO/IEC 14763-5, which will provide requirements on sustainability at all stages of the lifecycle of generic cabling – from planning and installation through to operation, maintenance and replacement. This this standard also provides guidance on the skills needed by designers, installers and other technicians in support of sustainable cabling systems.

approve, disapprove or abstain from adopting the standards. At this stage, all the experts within the member countries or organisations must come to an agreement between themselves on how to vote on publication, and the standard must achieve high proportion of the vote to be approved for publication. If approved, the standards are then published jointly by ISO and IEC as international standards, making them available for purchase and implementation worldwide.

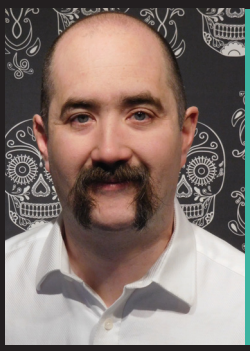
WELL WORTH THE EFFORT

The development of ISO/IEC generic structured cabling standards is a collaborative and iterative journey. It embodies the collective wisdom and expertise of stakeholders from around the world.

By adhering to a systematic approach and embracing international best practices, ISO and IEC foster the development of standards that promote interoperability, reliability and performance in telecommunications infrastructure. As technology continues to evolve and connectivity becomes increasingly critical, adherence to ISO/IEC standards remains essential for driving innovation and ensuring the seamless integration of diverse technologies in structured cabling systems.

PAVING THE WAY

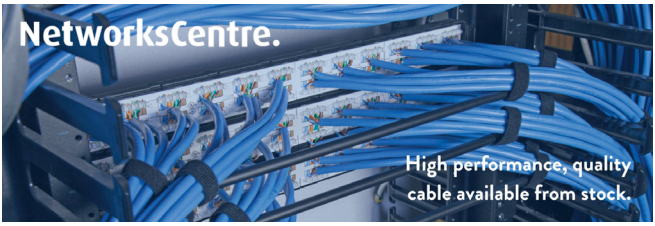
Through the meticulous efforts of technical committees, working groups and stakeholders, ISO/IEC standards pave the way for a connected world, where communication knows no bounds. The participation of a diverse range of stakeholders throughout the standards development process ensures that standards reflect the needs, priorities and expertise of the global community. By working together, stakeholders contribute to the advancement of industry standards, promote harmonisation across international borders and lay the foundation for a future where structured cabling systems enable seamless connectivity, innovation and progress. ■



JAMES WITHEY

James Withey is principal research and development engineer at Fluke Networks. He has over 20 years of experience in testing of cabling systems and has been involved with most international standard bodies including TIA, ISO/IEC and IEEE. He is the liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3.

Networks Centre



Networks Centre is part of the Alcadon Group, with warehouses and offices across central and northern Europe, specialising in network connectivity solutions with associated products and services. Our in-house RCDDs are well-placed to assist our installation partners in understanding the project requirements and recommending the most suitable products to meet the specifications and budgetary restraints.

Networks Centre has a vast offering of copper cabling solutions from leading brands:

- Panduit's PanNet and NetKey solutions provide a complete end-to-end infrastructure needed for copper cabling projects.
- Leviton's vast range of copper systems, including ATLAS-X1 and MILLENNIUM, mean your solution will not only be high quality but also a sustainable manufacturing option.
- Siemon's UltraMax and System 6A solutions deliver quality infrastructure for simple or complex projects.

Whether you need a full solution, a specified requirement or bespoke equipment, each of our brands have strengths you can utilise. To discover which state-of-the-art brand will suit your project **CLICK HERE,** call 01403 754233 or to send an email **CLICK HERE.**

www.networkscentre.com

Fluke Networks

There are many reasons why cabling certification is more important than ever.

Every time you complete the installation of a structured cabling system, you can choose whether to certify it. All links in the system should be tested in some way to make sure that they're connected properly, but is it necessary to measure and document the performance of every link?

All cable suppliers say that if you want a long-term warranty on your installation, certification is required. There are other benefits for you as the installer, too – protection in case of disputes, quality control, even your reputation among your customers and the competition.

Let's look at the value of certification for your projects in different situations. **CLICK HERE** to learn more about cabling certification and why it's so important.

www.flukenetworks.com

HellermannTyton

HellermannTyton offers a complete copper system as part of its LAN product range. The new Category 6A solution includes the Cat6A jack, patch panels, cable and patch leads. The Cat6A jack is designed to be toolless and does not require any specialist termination tools, while the Cat6A panels come in both flat and flat angled versions.

The new field termination plugs are used to create modular plug terminated links (MPTL) on-site for direct connection to fixed location devices. Like the Cat6A jack, the MTPL is a toolless product, providing engineers with a quick and flexible on-site solution. Along with the Category 6A products, HellermannTyton also has a range of Category 6 panels and outlets, along with a selection of LC and Euro modules, faceplates and backboxes.

All the new products from HellermannTyton are supplied in plastic free packaging where possible, so the company can do its bit for the environment and the planet.

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

Excel Networking Solutions

Excel Networking Solutions offers one of the market's most comprehensive ranges of copper cabling solutions, supplied in 100 per cent plastic free packaging.

Excel has launched a new range of products specifically suited for external infrastructure installations, which includes a unique Category 6A U/FTP S-Foil cable that comes with a double sheath with a PE Fca outer sheath for the external part of the installation. By stripping back the outer sheath using the nylon rip cord, the inner B2ca internal cable is revealed with its own unique part code.

Other products in the range include a Category 6A IP68 coupler, a Category 6A IP67 bulkhead coupler and Category 6A external rated patch leads, so installers can easily connect external devices with the knowledge that the connections are being kept watertight.

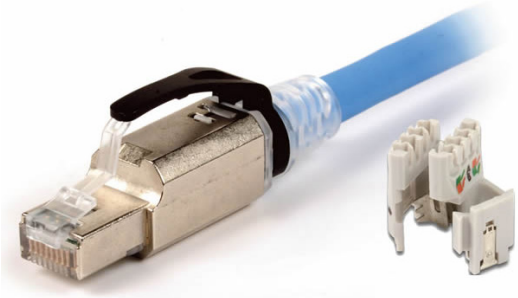
For more information about the full portfolio of Excel's copper cabling products **CLICK HERE,** to contact the sales team call 0121 3267557 or to send an email **CLICK HERE.**

www.excel-networking.com

Siemon

Siemon's Z-MAX Category 6A system raises the bar for performance and ease of use in data centres, LANs and smart buildings. This innovative solution boasts best-in-class transmission across all critical parameters.

The Z-MAX outlet's intuitive design simplifies terminations for UTP and shielded Category 6A, ensuring the fastest and most reliable connections. Paired with Siemon's Z-MAX modular cords featuring PCB-based plugs, they form a seamless high-performance system.



Additionally, Siemon's Z-PLUG, another Category 6A innovation, enables quick and dependable field terminated connections to power over Ethernet (PoE) powered devices in intelligent buildings. Z-PLUG terminated links offer custom lengths ideal for access points, security cameras, LED lights, distributed antenna systems (DAS) and building automation systems. Z-PLUG works with shielded, unshielded, solid and stranded cables, providing ultimate versatility.

To find out more **CLICK HERE.**

www.siemon.com

HARTING delivers custom-made connectors and cable assemblies for data centres

HARTING has been producing industrial connectors for over 75 years, with a focus on developing products that are easy to use, durable and reliable. Alongside its standard product ranges, the company also designs and manufactures bespoke cable assemblies at its manufacturing facility in Northampton. These assemblies are designed for the transmission of data, signals and power, and can be used in a wide range of markets including transportation, automation technology, energy and data centres.

One of its specialisms for data centres is connectorised cable assemblies, which distribute power from the data centre's uninterruptible power supply (UPS) to the power distribution units (PDUs) – a streamlined process that reduces costs and improves profitability. The assemblies consist of a cable between one or two connector hoods. Inside the connector is an insert or multiple inserts where the conductors from the cable are terminated. The connector hoods then mate with a matching housing wired to the PDU and/or UPS.

These cable assemblies are built using the Han-Eco electrical connector from HARTING, which ensures critical power to data systems via a quick and easy installation process. The Han-Eco system can support either power inserts with a built-in ground for safety or an unparalleled choice of modular inserts. What's more, the Han-Eco also reduces power wastage by up to 50 per cent by using low impedance contacts. The contacts reduce the power lost in connections and significantly improve the Power Usage Effectiveness (PUE) of a data centre.

Other customised solutions available include box builds, installing components, routing cable harnesses and fabrication. To further assist you, the HARTING in-house design team can create a 3D computer aided design (CAD) visualisation of your build beforehand to ensure absolute accuracy. It can also support you with thorough in-house testing of cabling and wiring.

HARTING also manufactures solutions for data network cabling including the ix Industrial connector, which offers significant internal board-to-cable and I/O panel space saving. Meanwhile, the Ha-VIS preLink RJ-45 system speeds-up and improves the reliability of on-site data network cabling repairs.

To learn more about HARTING's customised solutions for data centres **CLICK HERE** or **CLICK HERE** to send an email and one of our experts will contact you.

www.harting.com

Spot the difference

Arvind Patel of AEM compares the various copper cable certification standards

Field testing of network cables is an important step in ensuring a good quality installation. Standards bodies across the world play a significant role in developing requirements for various electrical parameters to certify cable.

MULTIPLE CHOICE

There are several standardisation bodies around the world. The good news is that most of them collaborate well with each other and define similar standards. However, there still are areas where these standardisation bodies differ. If you are dealing with network infrastructure projects in multiple countries, knowing these differences is necessary. There are various standards that we should consider. First, networking standards defined by IEEE (802.3 series) – the electrical parameters of the cabling must comply with the requirements of these standards.

Second, cabling standards as specified by bodies such as TIA or ISO/IEC. These standards consider current and future networking technologies, cable construction technologies, installation practices and operating environment, while developing standards that cables, components and cabling channels and links are specified for. Standards bodies also specify requirements for field testers, including how they should report test results, based on the cabling standards. In this article, we will look at cabling standards and corresponding field tester standards, and outline similarities and differences among TIA and ISO/IEC specifications.

Table 1. Cabling parameters and standards

Parameters	TIA-568.2-D	ISO/IEC 11801-1
Wiremap, DC loop resistance, DC resistance unbalance within two wires of a pair, DC resistance unbalance pair-to-pair, length, delay, delay skew, insertion loss, return loss, TCL, ELTCTL, coupling attenuation, NEXT, PSNEXT, ACRF, PSACRF, PSANEXT, PSAACRF	Specified	Specified
ACRN/ PSACRN	Not specified	Specified

PREMISE CABLING STANDARDS

In most parts of the world, four pair twisted pair copper cabling follows either TIA-568.2-D or ISO/IEC 11801-1 specifications. There are other regional standards in some parts of the world, such as China, which are strongly aligned with ISO/IEC standards. Table 1 shows

a comparison of electrical parameters specified in TIA-568.2-D and ISO/IEC 11801-1.

As you can see, all parameters other than attenuation to near end crosstalk ratio (ACRN) and power sum attenuation to crosstalk ratio near end (PSACRN) are specified by both standards. ACRN is specified only in the ISO/IEC standard. As ACRN is derived from insertion loss (attenuation) and near end crosstalk (NEXT), which are specified parameters for the TIA standard, this difference is non-material in nature.

OTHER CABLING STANDARDS

• Industrial cabling

TIA-1005-A is an industrial cabling standard that specifies parameters like those listed in Table 1, except for DC resistance. This standard specifies transverse conversion loss (TCL) and equal level transverse conversion loss (ELTCTL) only for unshielded cables.

• Single Pair Ethernet (SPE)

SPE is an emerging technology for cabling in many different environments ranging from automotive to industrial to enterprise. TIA-568.5 specifies SPE cabling for enterprise environments. Performance parameters specified in TIA-568.5 are listed in Table 2.

Table 2. SPE parameters

Parameters	TIA-568.5	ISO/IEC 11801-1/AMD1 (draft)
Wiremap, DC loop resistance, DC resistance unbalance within two wires of a pair, length, delay, insertion loss, return loss, PSANEXT, PSAACRF	Specified	Specified
TCL, ELTCTL	Specified for UTP only	Specified for UTP only

FIELD TESTING STANDARDS

TIA-1152A and IEC 61935-1 are standards that specify the performance requirements for field testers. They also specify test

Table 3. Field test parameters

Parameters	TIA-568.2-D	ISO/IEC 11801-1
Wiremap including shield connection if present, length, delay, delay skew, insertion loss, return loss, coupling attenuation, NEXT, PSNEXT, ACRF, PSACRF, PSANEXT, PSAACRF	Specified, mandatory	Specified, mandatory
ACRN/ PSACRN	Not specified	Specified, mandatory
DC loop resistance	Specified, optional	Specified, mandatory
DC resistance unbalance within two wires of a pair, DC resistance unbalance pair-to-pair	Specified, optional	Specified, optional
Length	Specified	Not specified
TCL, ELTCTL	Not specified	Specified, optional
Coupling attenuation	Not specified	Not specified

'There are several standardisation bodies around the world. The good news is that most of them collaborate well with each other and define similar standards. However, there still are areas where these standardisation bodies differ.'

parameters that need to be reported, the reporting format and classify reporting parameters as either mandatory or optional.

Table 3 specifies field test parameters for four pair cabling certification testers. Please note that it is not necessary that every certification test report all the mandatory parameters. The table lists the capability of the tester, which gets utilised depending on the parameters required for a chosen certification test.

Between the TIA and ISO versions of these requirements, there are some differences. DC loop resistance and unbalance in resistance are important parameters for power over Ethernet (PoE). Even if they are marked optional, these measurements provide important assurance of PoE performance. Coupling attenuation is a parameter that provides insight on shield effectiveness for shielded cables. This measurement is a laboratory measurement and ensured by the design of the cables, and hence field testers are not required to support this.

Table 4. SPE field test parameters

Parameters	TIA-5071	IEC 61935-4 (draft)
Wiremap including shield connection if present, DC loop resistance, length, delay, insertion loss, return loss, coupling attenuation, TCL (unshielded), ELTCTL (unshielded), PSANEXT, PSAACRF	Specified, mandatory	Specified, mandatory
DC resistance unbalance (shielded)	Specified, mandatory	Specified, optional
Coupling attenuation	Not specified	Specified, optional

SPE FIELD TESTING

TIA-5071 specifies field tester requirements based on the TIA-568.5 standard. In addition to the parameters as listed in Table 4, the two standards also specify testing to different lengths and frequencies, as shown in Table 5. This allows a possibility to have field testers that only support one of the specified categories. However, in practice commercial field testers support all these categories.

ROLE PLAY

Standards bodies play an important role in formalising the requirements for cabling, their test parameters, testing methodologies and reporting. TIA and international standards are largely similar, with some differences originating from the applications targeted and range of cabling systems covered. ■

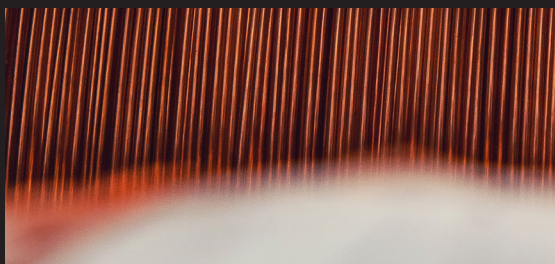


Table 5. Frequency ranges and field tester categories

Frequency Range	TIA-5071	IEC 61935-4 (draft)
0.1-20 MHz	SP-I	SP-I
0.1-600 MHz	SP-II	SP-II
1-1250 MHz	-	SP-III

ARVIND PATEL
Arvind Patel is director of engineering in the Test and Measurement Solutions division at AEM. He is a product engineer and architect, with over 20 years of experience in electronic circuits and radio frequency systems. He has been involved in the design and development of test and measurement solutions for the cabling industry for the last 15 years.

Black Box opens Hyperscale Data Center of Excellence in Minnesota

Black Box has opened its state-of-the-art Hyperscale Data Center of Excellence (DCoE) in Inver Grove Heights, Minnesota. With over 30 years in the Minnesota region, the company marks a significant milestone with this new facility, demonstrating its commitment to innovation and excellence in data centre services and the technology industry.

The Hyperscale DCoE is designed to meet the evolving needs of hyperscale data centres, offering a comprehensive suite of services tailored to optimise performance, efficiency and reliability. Key focus areas of the Hyperscale DCoE include complete custom cable management, hyperscale-specific training, quality assurance, logistics-as-a-service (LaaS), server refresh, fit-outs, audiovisual integration and comprehensive networking support.

Safety is ingrained in Black Box's organisational culture, protecting the company's employees, clients and communities. As part of the commitment to safety, the Hyperscale DCoE will integrate training programs to uphold the highest standards of occupational health and safety.

Host-IT welcomes two new colocation customers

Host-IT, an nLighten company, has announced two new customers for its colocation and managed connectivity services based at nLighten's UK data centres. Ruptura Infosecurity is now using the data centre in Milton Keynes and NTT Stanton Lea is using the facility in Bristol. This follows a recent review by both firms of their immediate and future IT requirements with Ruptura deciding to migrate servers and switch equipment off premise and NTT Stanton Lea moving servers directly from its previous local data centre provider.

NTT has been implementing telemarketing awareness and fundraising campaigns on behalf of charities and the third sector since 1988. It is the call centre behind various well-known national campaigns including The World's Biggest Coffee Morning organised by Macmillan Cancer Support. Ruptura InfoSecurity's remote-based team of highly accredited penetration testing specialists provides a range of cybersecurity services to over 150 end clients. These include major financial institutions, fintechs, crypto exchanges, human resources, legal and insurance clients.

Vantage Data Centers expands EMEA portfolio with first Dublin campus featuring next generation energy solution

Vantage Data Centers is entering the Irish market with the development of a multi-phase data centre campus named DUB1. The company will invest more than €1bn over multiple phases to support the construction and delivery of the campus. The first two phases consist of 52MW of IT capacity, with the first phase expected to be operational in late 2024.

Located in Dublin's Profile Park, Grange Castle, the 38,000m² campus will consist of one 32MW facility and one 20MW facility. The highly efficient campus is being built in alignment with Vantage's sustainable blueprint to deliver a Power Usage Effectiveness (PUE) rating of 1.2 using virtually no water for cooling.

It will include an on-site 100MVA multi-fuel generation plant capable of running a combination of fuels, primarily hydrotreated vegetable oil (HVO). This on-site generation plant will support current capacity constraints by alleviating pressure on energy demand from the grid, while achieving optimal efficiency and power output. The generation plant is also capable of funnelling power back to the grid, further supporting power availability in the Dublin area.

PROJECTS & CONTRACTS IN BRIEF

Lenovo has unveiled new solar panels at its in-house manufacturing facility in Budapest, Hungary, powering high performance computing (HPC) innovation. Lenovo's newest Global Innovation Centre, unveiled in October 2023 and operating on-site at the facility, now has the capacity for customers to test HPC workloads on 100 per cent solar energy.

Diakonie Nord Nord Ost has implemented Planon's Real Estate Management for SAP S/4HANA into its existing SAP public cloud landscape. This solution will enable Diakonie to streamline and optimise its real estate and facility management processes.

DRFortress has launched a new public cloud on-ramp solution with Megaport to offer Hawaii-based businesses secure, high-speed access to premier cloud providers via DRFortress' Cloud Connect.

GTT Communications has deployed state-of-the-art IP networking technology across its backbone. This upgrade enables customers to easily increase port capacity from 400Gb/s to 800Gb/s, as market trends continue to drive growth in traffic.

All you need to know

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An open and shut case

Thomas Ritz of R&M looks at whether closures for future ready fibre to the home (FTTH) networks should be buried or cabinet mounted

When rolling out FTTH networks, the deployment of closures, which are used to protect and manage fibre optic splices, can be done in several ways. They can be placed in outdoor cabinets (above ground) or buried (below ground). When it comes to choosing between these two options there are several factors to consider. I'd like to take a closer look at these factors and compare how they might affect the decision.

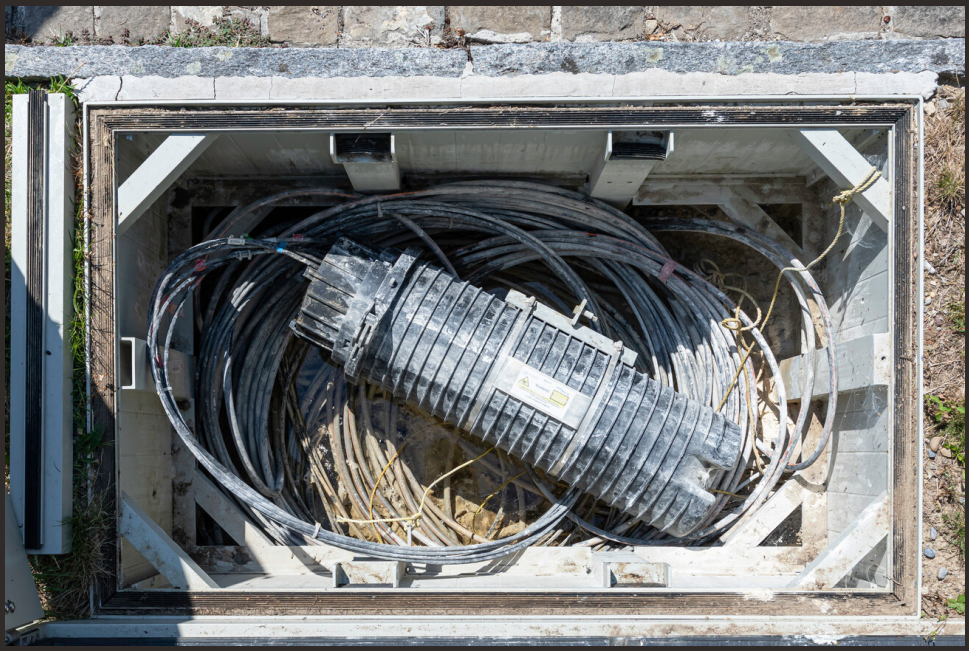
DEEP DIVE

Buried closures require a relatively low initial investment. They can positively affect rollout speed thanks to the very limited number of steps needed to make a connection. However, working with outdoor closures can be challenging and time-consuming. Excavation may require additional labour, but if existing conduits or ducting can be reused for fibre, this can make buried closures far more attractive.

Often, dedicated equipment and training is required to place closures. When choosing a solution it is important to check whether this can be avoided through smart design choices. What's more, the environment is less controlled when burying closures, which can complicate installation, especially in adverse weather conditions such as high winds, heavy snowfall or severe storms.

However, buried closures are less likely to be damaged compared to above ground cabinets, which are more exposed to the elements. Nonetheless, it is vital to ensure closures have been specifically designed for ease of use in access network applications – preferably with a focus on a compact form factor and usability. They should also offer practical features such as strain relief and secure fibre routing.

‘The best selection optimises cost, reduces initial investment, saves long-term operating expenses, speeds up rollout, and can improving the stability and security of a network. However, the choice between using buried closures and closures in a cabinet is always influenced by local regulations, urban planning norms and technical legacy infrastructure.’



PLAN OF ACTION

Rollout planning can also often be simplified when using buried closures, as the closures are simply introduced along the planned fibre route. Cabinets may require a great deal of scouting for appropriate locations, getting planning permission and spanning significant distances to properties that need to be connected.

On the other hand, easy component accessibility and reduced exposure to the environment can make installation of closures more straightforward. In urban areas where space is at a premium, or in areas of great natural beauty, outdoor cabinets are often not an option. Buried closures save space and avoid cluttering landscapes or sidewalks – important when it comes to urban planning and community acceptance.

Many cities have specific aesthetic

or community impact standards that discourage above ground infrastructure to maintain visual appeal or historical integrity. Also, buried closures eliminate safety hazards that above ground cabinets might pose on pavements, pathways or near roads.

COST EFFECTIVENESS

The initial set-up cost for outdoor cabinets can be higher due to the expense of the cabinet itself, along with its installation and potential site preparation costs. On the plus side, cabinets can potentially house additional equipment, which can offset the initial higher costs by serving multiple purposes.

With buried closures, the investment in burial can generally be offset by savings on above ground structures – providing the buried closures are competitively priced. The initial costs are bound to be lower since there's no need for physical cabinets, but you'll need to ensure the quality is excellent to keep down long-term maintenance and upgrade costs.

Of course, buried closures are less accessible, so there's a reduced risk of vandalism, tampering or adverse effects of harsh environments. This means lower maintenance and repair costs over time. This can contribute to overall cost effectiveness. The protection offered by burial can extend the life of closures, reducing the frequency of replacements. This longer lifecycle can also contribute to cost-effectiveness over time.

ADDING UP

An advantage of buried closures is the fact that the addition of new subscribers during operation is very convenient. When a new subscriber needs to be added, technicians can access a strategically located closure to splice in the new connection without disrupting the existing network service.

Many buried closures are installed with future expansions in mind, including spare capacity for additional fibres or splice trays. This foresight means that adding new subscribers can often be done without needing significant new infrastructure, just the activation of pre-laid fibres or the addition of new ones into the existing closure.

A MODULAR APPROACH

Closures in outdoor cabinets are typically more modular, as cabinets are designed to accommodate expansions and changes in the network. Modularity in buried closures can be limited by their physical inaccessibility. This can limit the ability to quickly adapt to network changes or expansions. However, the latest technology developments make this less of an issue.

Modern buried closures are designed for ease of access and capacity expansion.

They often feature re-enterable seals and modular internal components, facilitating the addition of new fibre connections without significant effort or specialised equipment. A well thought out modular concept allows additional subscribers to be connected at a later stage. Ideally, fibre count upgrades and cable type changes should be possible at any time during operation and closures can be created according to customer specifications.

THE RIGHT CHOICE

The best selection optimises cost, reduces initial investment, saves long-term operating expenses, speeds up rollout, and can improve the stability and security of a network. However, the choice between using buried closures and closures in a cabinet is always influenced by local regulations, urban planning norms and technical legacy infrastructure. The best choice always depends on specific project requirements including location, budget constraints and future expansion plans. When in doubt, don't hesitate to check with an expert! ■

THOMAS RITZ

Thomas Ritz is market manager public networks at R&M. An electrical engineer with skills in communication networks and radio frequency technology, fibre optic telecom, testing and sensor applications, he has worked in international, technology-based solution selling for over 30 years. With leadership experience in international sales and strategic marketing, Ritz is always keen to tackle new business and product portfolio development and design challenges.

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