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▶ As demand for enterprise and data centre network infrastructures continues to grow, so does the need for people to join the industry and further its development. And this is where the industry is hitting a brick wall.

The skills shortage is nothing new and the problem of attracting and maintaining talent is one that shows little sign of going away. To highlight the scale of the issue, Uptime Institute research found that the number of individuals needed to operate the world's data centres will grow from around two million to almost 2.3 million by 2025. So we are in a strange situation where one of the biggest growth sectors on the planet can't find enough people to work in it.

In this issue, CNet Training's Andrew Stevens examines the role training plays in addressing the digital infrastructure skills shortage. Richard Ednay of Optical Technology Training (OTT) then goes on to examine the effect of the coronavirus pandemic on training, the importance of practical hands-on skills development and what courses might look like in the metaverse.

Turning our attention to physical infrastructure, with its relatively low uptake in data centres, Question Time examines what the future holds for Category 8 copper cabling. A panel of experts assesses whether its potential to attain a link length of up to 50m in its 25GBASE-T variant will make it more suitable for use in next generation local area networks in intelligent buildings.

Also in this issue we focus on fibre optic cabling standards, with three excellent articles on the subject. In the first, Dave Kozischek of Corning looks at the role of standards in data centre design and planning. Gary Bernstein of Siemon then reviews the recent work of the IEEE and Sean McCloud of Leviton explains the key considerations when extending the reach of a network infrastructure.

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

Rob Shepherd
Editor

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Colt DCS secures 10 new sites across Europe and APAC

Colt Data Centre Services (DCS) has secured 10 new parcels of land across Europe and Asia-Pacific (APAC) for the development of greenfield hyperscale data centres. These include sites in London, Frankfurt, Paris and Japan.

The new sites see the capacity of Colt DCS' portfolio increase dramatically by over 500MVA of secured power to support the development of hyperscale data centres. With these latest land purchases Colt DCS is on track to be able to develop around 100MW of IT power

Niclas Sanfridsson

in its key global markets to support its customers' growing capacity requirements.

'This announcement marks yet another major milestone in the acceleration of our hyperscale strategy and positions Colt DCS as a major hyperscale and large enterprise data centre provider,' commented Niclas Sanfridsson, the company's CEO. 'This is an extremely exciting time for the business, as our vision of becoming the most trusted and customer-centric hyperscale data centre operator in the industry is realised.'

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Siemon joins the Ethernet Alliance

Siemon has joined the Ethernet Alliance, a global, non-profit, industry consortium dedicated to the continued success and advancement of Ethernet technologies. As the premier industry voice for Ethernet, the Ethernet Alliance provides a forum for the open exchange of ideas and a platform for consensus building to increase advancement and adoption of Ethernet technology around the world.

Siemon is committed to providing innovative cabling and connectivity solutions that enable that advancement and adoption. John Siemon, the company's

John Siemon

chief technology officer, said, 'The Ethernet Alliance has long been committed to supporting Ethernet development through industry standards and multivendor interoperability. This falls perfectly in line with Siemon's longstanding participating in industry standards and commitment to delivering standards based, quality solutions. We are extremely pleased to join this consortium of likeminded industry leaders all working together to expand the Ethernet ecosystem and educate markets worldwide about this technology's expansive capabilities.'

Pulsant acquires Manchester data centre as part of edge computing strategy

Pulsant has completed the acquisition of a Manchester data centre and associated clients from M247. The acquisition supports Pulsant's strategy of geographic expansion, enabling the company to extend its edge platform to the city and the north-west.

Rob Coupland

Situated within a secure compound in central Manchester, the 6,500ft² data centre provides capacity of around 1MW power, with further investment planned to expand and upgrade the facility. The location complements Pulsant's existing network of strategically located data centres, offering good transport links and connectivity, including a LINX Manchester point of presence (PoP) on-site.

Rob Coupland, chief executive officer at Pulsant, said, 'I am very excited to be bring the Pulsant edge computing platform to the Manchester market. The acquisition of such an established and high quality facility is an important step in our strategy to bring the benefits of edge computing to every business across the UK.'

CityFibre partners with the University of Edinburgh to encourage learners to pursue careers in data science

CityFibre has teamed up with the Data Education in Schools project at the University of Edinburgh to create a learning tool that helps school pupils develop skills in data science.

Data Education in Schools is part of the DDI Skills Gateway – a £6.9m investment in data skills and education as part of the Edinburgh and South East Scotland City Region Deal. The project supports the SQA's Data Science National Progression Award (NPA), a school level qualification in data science, which is the first of its kind. CityFibre provided a data set and problem statement that guides users through the steps of solving a real world business problem using data.

Elaine Doherty, head of data insights at CityFibre, said, 'As soon as we heard about the NPA Data Science award and its potential to encourage the next generation to get involved in data science, we really wanted to support the project.'

Organisations board the multi-cloud train with strong cost control focus

Nutanix's fourth global Enterprise Cloud Index (ECI) survey and research report has shown that multi-cloud was the most commonly used IT environment by 53 per cent of UK respondents. Continuing this trend, 82 per cent said they intend to be using multiple clouds in the next 1-3 years, with 21 per cent already using three or more public clouds and 80 per cent naming hybrid multi-cloud as the ideal operating model.

Survey respondents were asked about their current cloud challenges, how they're running business applications now and where they plan to run them in the future. They were also asked about the impact of the

Alan Campbell

coronavirus pandemic on IT infrastructure decisions and how IT strategy and priorities may change because of it.

Alan Campbell, general manager and senior sales director UK & Ireland at Nutanix, said, 'UK companies are leading the global pack in deploying multi-cloud environments, while acknowledging the potential hurdles with multi-cloud management, security and application mobility. These concerns represent an urgency for cloud agnostic tools that provide unified visibility, security and control of an entire hybrid multi-cloud infrastructure.'

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NGMN defines industry standard for a Global Green Networks Benchmark

The Next Generation Mobile Networks Alliance (NGMN Alliance) has announed the establishment of methodologies and key performance indicators (KPIs) for a Global Green Networks Benchmark. The new initiative is part of its Green Future Networks Programme and is set for generating a global standard for the industry. While current mobile network benchmarks mostly concentrate on comparing service quality and user experience, the new Global Green Networks Benchmark will place the focus on green network operations.

Arash Ashouriha, senior vice president

Arash Ashouriha

group technology innovation at Deutsche Telekom and chairman of the NGMN Alliance board, stated, 'Implementing concrete actions to mitigate climate action is a key priority for our industry. The Global Green Networks Benchmark will certainly help the entire telco industry by providing transparency regarding operators' sustainability. In addition, it offers operators a unique opportunity to prove their sustainability credentials towards their customers and be recognised for their positive environmental and societal impact.'

Vertiv joins the RISE partnership programme to develop sustainable data centre technologies

Vertiv has formed a new partnership with Research Institutes of Sweden (RISE). Vertiv is entering the partnership program for data centre systems technologies at the platinum level, joining founding partners such as Facebook, Ericsson, Vattenfall, ABB, LTU and the Norrbotten region.

RISE is based in Luleå. Collaborating with universities, industry and the public sector, it performs industrial research and innovation, with the overall objective to support sustainable growth by strengthening industry competitiveness and renewal. A key value in the collaboration is the large scale test environment with data centre modules, climate and heat boxes, wind tunnels, edge and liquid cooling testbeds. It has the ability to take simulations and concepts to the point of implemented demonstrations and tests for data collection and analysis.

'RISE is driving sustainability across Europe and Vertiv is ideally placed to provide it with forward looking engineering solutions for the data centre industry and beyond,' said Giordano Albertazzi, Vertiv's EMEA president. 'Data centres are a critical part of the digital infrastructure. Efficiency and sustainability are a strong focus for the industry and are becoming increasingly important. New technologies, system solutions and components need to be ideated, developed, tested and verified before hitting the market. We see our partnership with RISE being a big part of that.'

Giordano Albertazzi

NEWS IN BRIEF

General Data Protection Regulation (GDPR) fines hit over €1bn in 2021, with 412 total penalties issued. In addition, companies like Amazon and WhatsApp had to pay off the most significant penalties for violating GDPR laws.

Colt Technology Services has received Frost & Sullivan's 2021 European Managed SD WAN Services Customer Value Leadership Award. It is in recognition of its position at the forefront of innovation and growth, creating new products, solutions and services that meet ever-evolving customer needs and advance the overall market.

Geiger Maximizing Net Solutions and Geiger Data Network Design are now part of Legrand. The acquisition will help Legrand and its partners to further enhance the customer experience by simplifying the design, installation, commissioning and operational processes within their data centre activities.

Pipedrive has opened a newly built Rackspace OpenStack private cloud environment in the UK, provided by Rackspace Technology. Rackspace Technology has also agreed to acquire Just Analytics, a leading provider of cloud based data, analytics and artificial intelligence (AI) services based in the Asia Pacific and Japan (APJ) region.

It's time to rethink the con

Hi Rob

Data centres that are designed to meet the needs of standard or enterprise business applications are plentiful. Yet flexible and user defined data centres for edge applications, which rely on dynamic real time data delivery, provisioning, processing and storage, are in short supply.

That's partly because of the uncertainty over which applications demand such infrastructure and over what sort of timeframe. However, there's also the question of flexibility. Many of today's existing micro data centre solutions meet a predefined concept of edge or, more accurately, localised, low latency applications, which also require high levels of agility and scalability. This is due to their predetermined or specified approach to design and infrastructure components, often led by the vendor.

To date, the market has been met with small scale edge applications, which have been deployed in pre-populated, containerised solutions. A customer is often required to conform to a standard shape or size and there's no flexibility in terms of their modularity, components or make-up.

One might argue it comes with the subjective nature of edge computing, which is often shaped to support a vendor defined technology. Standardisation has also been beneficial for our industry, offering several key advantages including the ability to replicate systems across multiple locations. But when it comes to the edge, some standardised systems aren't built for the customer – they're a product of vendor collaboration. This is also accompanied by high costs and long lead times.

On the one hand, having a piece of pre-integrated infrastructure with everything in it can undoubtedly solve some pain points, especially where deployment is concerned. But what happens if the customer has their own alliances, their own definition of the edge, or may not need all of the

cept of micro data centres

components? What happens if they run out of capacity in one site or need a modular system that scales?

Then those original promises of scalability or flexibility disappear, leaving the customer with just one option – to buy another container. One might consider that rigidity, when it comes to standardisation, can often be detrimental to the customer. The point here is that when it comes to micro data centres, a one size fits all approach does not work. End users need the ability to choose their infrastructure based on their business demands – whether they in industrial manufacturing, automotive, telco or colocation environments. But how can users achieve this?

Vendor agnostic and flexible micro data centres are the future for the industry – an approach that builds containment systems around customers' needs, without forcing their infrastructure to fit into boxes. Users should have the flexibility

to utilise their choice of best in class data centre components including the IT stack, uninterruptible power supplies (UPS), cooling architecture, racks, cabling or fire suppression systems.

By taking an infrastructure agnostic approach it's possible to give customers the ability to define their edge, and use standardised and scalable infrastructure in a way that's truly beneficial to their businesses.

Andy Connor
Subzero Engineering

Editor's comment
Growing data demands are forcing engineers to think creatively about the ways they design and develop data centres. Andy's point about the rigidity of some micro data centre solutions is pertinent and one that needs to be addressed in order to fully meet the potential of the edge.

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Love and eight

With relatively low amounts of Category 8 copper cabling being installed in data centres, Inside_Networks has assembled a panel of industry experts to discuss its future and whether using it in intelligent buildings could be the answer
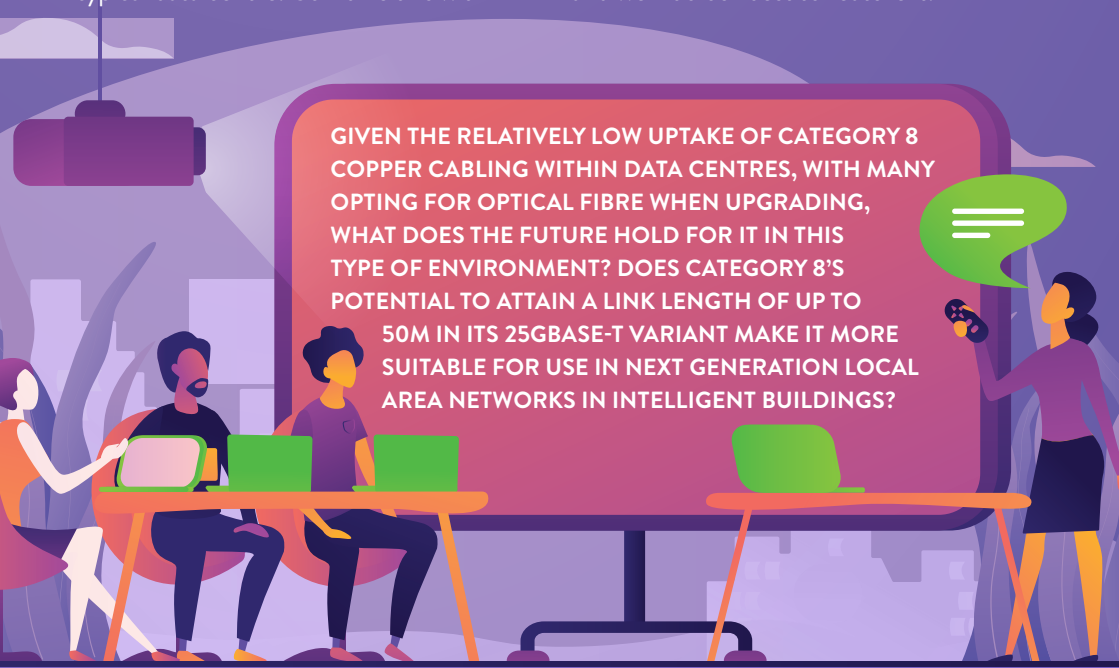
▶ Category 8 cabling offers four times the bandwidth of Category 6A and supports IEEE 25GBASE-T and 40GBASE-T server to access switch interconnect applications. However, because of its distance limitation of 30m, Category 8 copper was originally touted as being only useful for data centre networks in the access layer. This was the first major shift away from the 'one size fits all' approach.

The argument went that using copper ports in this capacity brings significant savings, as the per-port cost is lower than that of optical fibre. The savings add up rapidly when multiplied by the hundreds of thousands of cables required in a typical data centre. Combine this with backwards compatibility and the ability to convey power to remote devices such as wireless access points, and the case for copper remains a convincing one.

Despite this, uptake of Category 8 in data centres has been limited. However, with some manufacturers highlighting Category 8's potential to attain a link length of up to 50m in its 25GBASE-T variant, it has been suggested that its future is in power over Ethernet (PoE) dependent intelligent buildings. Inside_Networks has assembled a panel of experts to examine this subject and assess whether Category 8 has a future.

Don't forget, if you have a question that you would like answered **CLICK HERE** and we'll do our best to feature it.

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GIVEN THE RELATIVELY LOW UPTAKE OF CATEGORY 8 COPPER CABLING WITHIN DATA CENTRES, WITH MANY OPTING FOR OPTICAL FIBRE WHEN UPGRADING, WHAT DOES THE FUTURE HOLD FOR IT IN THIS TYPE OF ENVIRONMENT? DOES CATEGORY 8'S POTENTIAL TO ATTAIN A LINK LENGTH OF UP TO 50M IN ITS 25GBASE-T VARIANT MAKE IT MORE SUITABLE FOR USE IN NEXT GENERATION LOCAL AREA NETWORKS IN INTELLIGENT BUILDINGS?

PIERS BENJAMIN
EMEA IBN MARKETING MANAGER AT CORNING OPTICAL COMMUNICATIONS

While Category 8 copper cabling remains a compelling media for the last point to point connection to a device, when we move to longer distances it becomes much less viable for several reasons. These range from heat issues and the number of splitters required to challenges around cable management and congestion.

Category 8 copper may continue to have useful applications for in building networks in power over Ethernet (PoE), which has traditionally been achieved over a twisted pair copper cabling system. This can also be optimised, however, when PoE is required throughout a larger enterprise space and more optical fibre is introduced to the horizontal.

One attractive solution is composite cables, which include both fibre and copper conductors under the same jacket. This leverages the bandwidth capabilities of singlemode fibre and the powering capabilities of copper to deliver both data and power, across distances of over 300m in some cases, to enable devices at the edge of the network. Intelligent power technology paired with smaller 'micro zones' could power several 25W PoE devices using a combination of a single small composite fibre and copper cable, combined with short patch cables running to and from the micro zone.

This solves a number of problems. Foremost is the distance limitations of Category 8 copper but also congested pathways, with increased demands on the network requiring multiple layers of single purpose infrastructure. Composite cable can take up much less space and this means more capacity for future upgrades with, often, reduced maintenance costs.

Common applications that we're seeing for long distance PoE applications include security CCTV camera networks, distributed antenna systems (DAS), passive optical networks (PON), as well as any remote low voltage powered applications. IP cameras and security devices, for example, are now common throughout indoor and outdoor spaces, but may not be close to existing telecom rooms or a PoE based switch.

Ultimately, if you're only looking to achieve data rates of up to 25Gb/s over limited distances, Category 8 will continue to be an option, but for anything more significant, composite and fibre cabling represent a more viable solution.

> 'ULTIMATELY, IF YOU'RE ONLY LOOKING TO ACHIEVE DATA RATES OF UP TO 25GB/S OVER LIMITED DISTANCES, CATEGORY 8 WILL CONTINUE TO BE AN OPTION, BUT FOR ANYTHING MORE SIGNIFICANT, COMPOSITE AND FIBRE CABLING REPRESENT A MORE VIABLE SOLUTION.'

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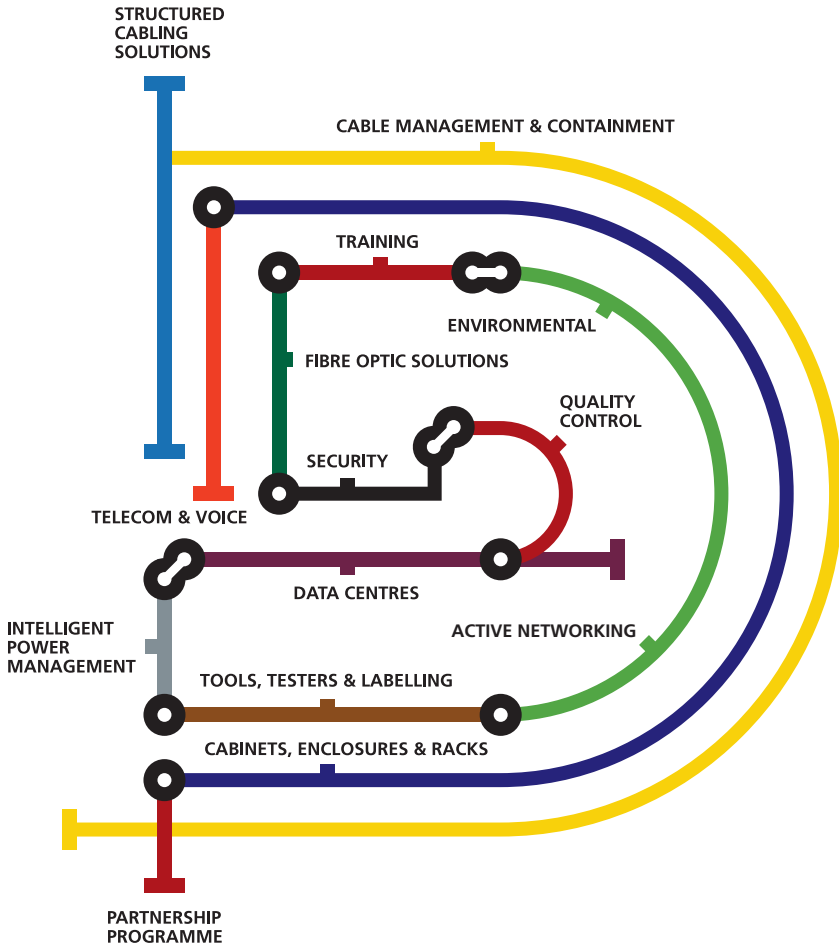
MOHAMMAD SHAHID KHAN
GLOBAL APPLICATIONS ENGINEERING LEAD AT STL

The deployment of new applications within data centre environments is moving forward at lightning pace and connectivity requirements are becoming more complex. It is therefore critical to select a cabling solution that meets current and upcoming application needs, as lower bandwidth cable can no longer support current requirements and availability. Although it offers higher bandwidth, Category 8 cabling's low adoption in data centres is primarily due to its restricted length support of up to 30m, as well as issues with connector availability.

Structured cabling includes the generic cabling solutions outlined in the EN 50173 series between closures. It has either a peer to peer or hierarchical structure that enables the installation of cross-connects or interconnects at the closures. In the data centre, plug and play connectivity uses rack cabling groups to easily connect each equipment rack to the central network racks, making up an entire modular cabling system.

A modular and scalable solution that grows with a data centre is therefore essential for meeting capacity needs and reducing costs. Interconnected cabling that reduces physical requirements also enhances overall conditions for data centre cooling and ongoing support. Pre-fitted, pre-terminated and pre-tested solutions can also reduce time to install by up to 75 per cent. It is important here to mention power over Ethernet (PoE), as twisted pair cable is best suited to support the emerging applications used for data, video and voice communications, as well as simultaneously powering communications equipment.

To cope with the aforementioned critical factors, Category 8's higher headroom meets and exceeds the ANSI /TIA-568.2-D horizontal link performance margin, and is suitable for addressing present and future business communications needs. Pre-terminated cabling solutions with the latest IEEE 802.3bt PoE support therefore makes Category 8 copper cabling useful for many applications within data centres.

Looking ahead, standards committees are already evaluating Category 8's potential to attain a link length of up to 50m in 25GBASE-T. This will certainly make it more suitable for use in next generation local area networks in intelligent buildings.

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'ALTHOUGH IT OFFERS HIGHER BANDWIDTH, CATEGORY 8 CABLING'S LOW ADOPTION IN DATA CENTRES IS PRIMARILY DUE TO ITS RESTRICTED LENGTH SUPPORT OF UP TO 30M, AS WELL AS ISSUES WITH CONNECTOR AVAILABILITY.'

STEFAN RIES
HEAD OF GLOBAL KEY ACCOUNT MANAGEMENT AT R&M

The intention of the Cat.8 standard was to utilise copper's maximal transmission capacity by abandoning the 100m transmission distance. After all, the 100m length requirement ensures that cabling will function in every possible scenario – but this uses also up a lot of spare performance capacity.

This was a pity, especially because the longer distances that can be reached are very rarely required. The sweet spot for achievable 40Gb/s was cabling of rows in data centres, bridging the application range between the in-rack direct attach copper cabling and the optical fibre links to the zone and main distributors.

The fact that this technology wasn't picked up on a large scale could have something to do with the technology itself and availability in relation to today's most commonly implemented data centre architecture. However, the technology is fully developed, available and defined for use. Applications requiring the capacity it can offer are appearing – not so much in the data centre arena, but in the office cabling space instead. This is even though some people thought that Category 6A with 10Gb/s was not really needed in office cabling some years ago.

Today, IT equipment is also used in a mobile way within office environments. To cover this requirement, a variety of technologies such as wireless LAN (WLAN) or 5G are being developed. For the WLAN option, in particular, cabling is required and it has been announced that the data rate demand for this type of WLAN access point will go as high as 25Gb/s.

The transmission data rate cabling capabilities for this kind of application are being investigated by standardisation committees, which are considering the transmission distance for 25Gb/s in line with existing cabling standards. The current edition of the ISO/IEC technical report states that a transmission distance of 25m could be expected with good Category 6A systems and 50m may be feasible with Cat.8.1.

As a Cat.8.1 system performs like a Category 6A system for 100m, but also offers 25Gb/s performance up to 50m, it may well be a very interesting proposition for office cabling!

> 'THE CURRENT EDITION OF THE ISO/IEC TECHNICAL REPORT STATES THAT A TRANSMISSION DISTANCE OF 25M COULD BE EXPECTED WITH GOOD CATEGORY 6A SYSTEMS AND 50M MAY BE FEASIBLE WITH CAT.8.1'

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CHRIS FRAZER
PRINCIPAL CONSULTANT AT LAYER ZERO SERVICES

I'll refer to Category 8 generically, covering both TIA and ISO variants.

This is the cabling 'chicken and egg' that we've seen before! Mostly it has been cable first followed by a protocol. Category 4 only supporting up to 16Mb/s Token Ring resulted in it becoming quickly replaced by Category 5 supporting 100 Megabit Ethernet. But that didn't last long, being superseded by Category 5e supporting 1Gb/s. Arguably, Category 7 never really had a protocol to make the most of its increased bandwidth, more than needed for 10Gb/s and not enough for 25Gb/s and 40Gb/s.

Category 8 and 25Gb/s and 40Gb/s still doesn't neatly fit the previous model of a 100m channel and four connectors, being limited to 30m and two connectors, or even 50m for 25Gb/s. It seems, for the moment at least, Category 8 is going the same way as Category 4 if it can't reach a critical mass of installed base to make it worthwhile for transceiver manufacturers to produce an economical product for it.

Data centres often differ from offices in design concept. In offices, commonly, there's a need to support 1Gb/s immediately and, possibly, 10Gb/s in the future. So, even if only needing 1Gb/s initially, it makes sense to install Category 6A instead of Category 5e. Data centres, on the other hand, are often more likely to be designed for what is needed on day one, with optical fibre being preferred for what might be needed on day two. If Category 8 is installed initially and 25Gb/s or 40Gb/s deployed, there's little chance of the cable supporting anything greater, so it's already at maximum capacity on day one.

Of course, many client requirements differ in data centres, so there's no hard and fast design concept to cover every situation, as there often is with offices using copper cabling for up to 100m. This variation in design and longevity makes Category 8 a challenging choice to justify in many cases.

I'm not seeing much within the office or intelligent building landscape that would drive a greater adoption of Category 8. My concern is that Category 8 may never find a protocol that would promote its use to anything other than a niche status. Category 9 supporting 25/40GBASE-T for 100m would be another story altogether!

> 'IT SEEMS, FOR THE MOMENT AT LEAST, CATEGORY 8 IS GOING THE SAME WAY AS CATEGORY 4 IF IT CAN'T REACH A CRITICAL MASS OF INSTALLED BASE TO MAKE IT WORTHWHILE FOR TRANSCEIVER MANUFACTURERS TO PRODUCE AN ECONOMICAL PRODUCT FOR IT.'

STUART MCKAY
BUSINESS DEVELOPMENT MANAGER AT PANDUIT

I believe that the current market opportunity for Category 8 copper cable is in the data centre industry. Moreover, due to its limited span length of around 30m, but high (2000MHz) bandwidth, it has a specific application in the middle to end row connectivity around cabinet formations. This allows a 30m channel to include a 24m link and 6m patch to the panel. This is a possible solution for new applications that require the bandwidth and benefit from keeping the whole processing configuration close together.

Panduit continues its support of the development of the Category 8 standard, as a further use of cost effective and simple twisted pair technology to run speeds up to 25GBASE-T or 40GBASE-T. Third-party industry tests have been undertaken to verify cable capability on 30m channel. The TIA-568-C.2-1 (IEEE 802.3bq) Cat 8.1 version is plug compatible with RJ-45 connectors, as is Category 5e, 6 and 6A cable. Conversely, Cat 8.2 cable requires connectors similar to Category 7 or 7A, which reduces the connectivity options to standard cabinet equipment, while increasing the stock option requirements.

Currently, switch manufacturers have not deployed equipment that takes advantage of Category 8's features. Consequently, most cable and connector companies that develop solutions concurrently with equipment manufacturers are also planning to launch product in similar timeframes – possibly as late as 2023.

So, what about the Category 8 opportunity in the intelligent building market? Like the data centre market, the intelligent building segment is already making use of the high bandwidth 10 Gigabit Ethernet Category 6A twisted pair cabling solutions that are widely available. Category 8's limited span is again a major restriction in buildings, and the lack of equipment on the market reduces its viability as the high bandwidth alternative. Category 6A already offers a large ecosystem of components and equipment, which ensures supply and interoperability, and keeps the market competitive.

At this time, if a customer is looking to install a high performing system and wants a supplier's promise that it will be supported into the future, I recommend Category 6A.

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'SWITCH MANUFACTURERS HAVE NOT DEPLOYED EQUIPMENT THAT TAKES ADVANTAGE OF CATEGORY 8'S FEATURES. CONSEQUENTLY, MOST CABLE AND CONNECTOR COMPANIES THAT DEVELOP SOLUTIONS CONCURRENTLY WITH EQUIPMENT MANUFACTURERS ARE ALSO PLANNING TO LAUNCH PRODUCT IN SIMILAR TIMEFRAMES – POSSIBLY AS LATE AS 2023.'

MIKE HOOK
EXECUTIVE DIRECTOR AT LMG

It's true that Category 8 cabling has had a slow uptake in data centres – an environment for which it is designed. Where connectivity demands exceed the capacity of Category 6A, it appears that optical fibre cabling has won out.

The question is why Category 8 would be any more appropriate than Category 6A and fibre for use in the local area network (LAN). What problem is Category 8 trying to fix that existing fibre and copper connectivity can't already address, either today or in the future?

User connectivity in the vast majority of LANs is provided via Wi-Fi and connected devices, other than wireless access points and cellular UniFi access points, are serviced by one or more Category 6A outlets or multimode fibre. Additionally, gigabit passive optical networks (GPONs) are set to gain traction in intelligent modular buildings such as hotels or apartments, where modules are connected by fibre (as opposed to Category 8) and the intra-module power over Ethernet (PoE) connectivity is serviced by Category 6A.

In general, internet of things (IoT) and smart building PoE devices don't have the high bandwidth demands that would necessitate Category 8. The distance limitations of Category 8 also means that it cannot accommodate the vast majority of smart building designs. With Category 6A supporting 10Gb/s and 100W over 100m, and fibre offering over 100Gb/s across more than 300m, it's hard to see where Category 8 fits in.

There is also the question of whether specifiers would be open to introducing yet another cable type into their supply chains, given the uncertainty and issues which still affect global logistics. Fibre cables have no supply chain issues and so come with less risk in that regard.

All in all, if Category 8 is not gaining traction in its intended data centre market, what hope is there of it finding a new application in the LAN space? The chances seem slim, considering the respective positions of both Category 6A and fibre cabling in addressing market needs for the foreseeable future.

> '**IF CATEGORY 8 IS NOT GAINING TRACTION IN ITS INTENDED DATA CENTRE MARKET, WHAT HOPE IS THERE OF IT FINDING A NEW APPLICATION IN THE LAN SPACE? THE CHANCES SEEM SLIM, CONSIDERING THE RESPECTIVE POSITIONS OF BOTH CATEGORY 6A AND FIBRE CABLING IN ADDRESSING MARKET NEEDS FOR THE FORESEEABLE FUTURE.'**

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- Main and remote are the same – both smart and can be deployed separately to conduct PoE, Multi-Gigabit and network testing
- Award winning testers
- Includes a three-year care plan and UK calibration including free repair or replacement due to accidental damage on the CV100 kits

  CLICK HERE to find out more.

▶ AEM TestPro multifunctional cable certifier

TestPro is an affordably priced purpose built tester that is designed to ensure modern smart building network infrastructure is fully qualified to support the demands of internet of things (IoT) connected devices.

Key features:

- Fastest Category 6A certification test on the market at six seconds
- Certifies twisted pair cable for Category 5e – Category 8 Level IIG

The AEM Tester range is approved by

AEM IN PARTNERSHIP MAYFLEX A Sonepar Company
CERTIFIABLY BETTER TESTING

MANUFACTURE

BELDEN SENDING ALL THE RIGHT SIGNALS | Berk-Tek A Nexans Company | COMMSCOPE® | Connectix Cabling Systems | Draka | excel without compromise

Nexans ELECTRIFY THE FUTURE | NORDEN | OCC OPTICAL CABLE CORPORATION | Paige | PANDUIT | premium line | PRYS

BELDEN SENDING ALL THE RIGHT SIGNALS | COMMSCOPE® | excel without compromise | molex | Nexans ELECTRIFY THE FUTURE | premium line

ring

AEM

MAYFLEX
A Sonepar Company

f award winning testers with multiple features and benefits.
usively through Mayflex in the UK

AEM Tester Hire Service

With a range of rental options at the fraction of the cost of purchasing a tester unit, this is an alternative cost effective solution to meeting your testing and certifying requirements. Save yourself the cost of purchasing a new tester unit, or try out the latest tester before committing to buying one.

CLICK HERE to find out more.

Why buy AEM from Mayflex?

Mayflex is the exclusive distributor for AEM in the UK and our experienced teams are on hand to advise and support you.

- 'Hands on' AEM events running until June
- Face-to-face demonstrations
- On premise/UK based calibration
- Specialist Support Services including managing your AEM testers
- AEM Tester Hire Service

CLICK HERE to find out more about the AEM test and measurement products available from Mayflex.

Get in touch

If you don't already deal with Mayflex, you can **CLICK HERE** to open an account.

For more information about Mayflex **CLICK HERE,** call our sales team on 0800 75 75 65 or **CLICK HERE** to send an email.

mayflex.com

R WARRANTY APPROVALS

COPPER

General Cable | HIKVISION | HITACHI Inspire the Next | HUBBELL Hubbell Premise Wiring | legrand | LEVITON | LS Cable & System | molex

MIAN | Rosenberger | R&M | SIEMON | SIGNAMAX | SUPERIOR ESSEX | Ultima | VERICOM

FIBRE OPTIC

CORNING | Corning does not offer warranty program approvals, but instead provides fibre testing requirements for their cabling system, of which the AEM TestPro is compliant.

AMS Helix appoints James Feeney as its senior technical director

AMS Helix has appointed James Feeney as its senior technical director. Focusing on the operation, design and delivery of critical infrastructure and complex technical services, Feeney will head-up technology development and innovation and help AMS Helix to continue to deliver solutions that exceed the expectations of clients throughout the data centre, edge and telecommunications sectors.

With over 30 years in the industry, Feeney brings a wealth of knowledge and experience. He has been involved in the design, construction and operation of telecommunications and data centre infrastructure across the UK and Europe, and has led the development of cutting edge technology and methodologies on high profile networks and projects.

Commenting on the appointment, Martin Murphy, partner at AMS Helix, said, 'We are delighted that James is joining us to help lead the next stage of AMS Helix's development and growth. His appointment will help to provide our clients with exceptional results through cost effective and innovative solutions, with a focus on operational performance.'

James Feeney

Mayflex launches its AEM Tester Hire Service

Mayflex has launched a hire service for AEM's test and measurement solutions. Mayflex partnered with AEM in November 2021 to bring the company's innovative solutions to the UK, providing customers with a greater choice and more options when it comes to testing.

Ross McLetchie, Mayflex's sales director, commented, 'Since the launch of AEM in the UK we've had a fantastic response from our customers. We ran 16 webinars up until 16th December, where numerous customers attended to find out more about AEM and its tester range.'

He continued 'We understand that for any installation company the initial outlay to purchase test equipment can be quite considerable. To this end we will be offering our customers the opportunity to hire an AEM tester on a weekly basis, as and when required, at a competitive weekly rental price. This also gives customers the chance to try the AEM TestPro or Network Service Assistant to see the many benefits on offer and experience their ease of use, before they decide to buy one.'

Ross McLetchie

Vertiv becomes the latest organisation to join Eurovent

Vertiv has become a corresponding member of Eurovent – Europe's industry association for indoor climate, process cooling and food cold chain technologies. Vertiv offers high performance thermal management solutions for critical spaces including custom air handling, air cooled and evaporative cooled rooftop direct exchange units, as well as indirect and direct evaporative cooling.

Mario Scattolin

Mario Scattolin, global compliance director at Vertiv, said, 'We are proud to become a corresponding member of Eurovent, one of Europe's leading heating, ventilation, air conditioning and refrigeration (HVACR) industry associations, which also helps certify the performance of our IT cooling products. By joining Eurovent, we look forward to working together to develop new solutions for efficient and sustainable systems with the latest standards for the environment and the industry as a whole.'

Centiel strengthens its sales engineering team with appointment of Tim Ng

Centiel UK has appointed Tim Ng as sales engineer for hardware. He joins Centiel from Dale Power Solutions, where he spent several years in the servicing department completing turnkey projects and leading a team of service engineers. He also worked at Paul Anton as a UPS field service engineer.

Louis McGarry sales and marketing director at Centiel UK, commented, 'Tim has a huge amount of experience in specifying, installing and commissioning a wide range of uninterruptible power supplies (UPS). He has delivered critical power equipment for offshore installations in the oil, gas

Tim Ng

and nuclear industries. These types of installations adhere to strict compliance, tight system tolerances and high levels of security. Tim's familiarity with these projects will offer added value for any organisation looking to protect critical loads with the highest levels of safety in mind.'

Ng added, 'Centiel's products are on another level in terms of the quality of design and components. Moving over to the sales side means I can now ensure that clients have the highest quality UPS solution to match their needs, supported by technical advice from an engineer.'

North reinforces its sustainability and carbon reduction pledge

North has embarked on the next stage of its sustainability drive with the launch of its first environmental, social and corporate governance (ESG) impact report. North has offset all of its emissions through an industry accredited carbon offsetting scheme to become carbon neutral, and has pledged to focus on reducing emissions.

The report unveils North's key environmental sustainability objectives and actions it will take to reduce, measure and monitor its impact through energy and sustainability related efficiencies, whilst streamlining its operations across the UK. North has pledged to ensure 100 per cent of its electricity comes from renewable sources and has also committed to other sustainability endeavours such as increasing its recycling rate.

ESG committee chair at North, Audrey Schaefer, said, 'This is a key milestone for North, as social, economic and environmental sustainability is a pillar of our strategy and embedded in our business and operational processes. We look forward to leveraging this commitment to deliver meaningful change across the sector.'

Audrey Schaefer

CHANNEL UPDATE IN BRIEF

Schneider Electric has been named a vendor champion in the Canalys Channel Leadership Matrix for the third year in a row. Canalys named APC an EMEA channel leadership champion for its consistently strong levels of account management, its commitment to partner led business models, and for the quality of its technical support.

NTT has announced Miriam Murphy's appointment as CEO of Europe NTT.

Mobotix has reached an official agreement to acquire Vaxtor Group.

Pax8 has expanded its partnership to a global agreement with SkyKick, offering managed service providers (MSPs) access to its advanced Cloud Manager application.

Mayflex has reached an agreement to be the sole distributor for Wavestore VMS solutions in the UK. Mayflex has distributed Wavestore for many years and the relationship is now moving on to become an exclusive partnership.

Nokia been selected by GO Malta as its sole strategic partner for a nationwide 5G RAN rollout in a seven year deal.

Cloud Distribution has been appointed as UK distributor for NetMotion by Absolute.

Audit | Design | Build | Test | Maintain

The what and the why

Dave Kozischek of Corning looks at the role of standards in data centre design and planning

▶ We generate, process and store big data every day. The demand for bandwidth is ceaseless and every new technological innovation, from artificial intelligence to virtual reality, brings new challenges in managing this data. These developments have created a surge in the need for facilities to be positioned closer to the user to enable a data offering with more flexibility, high quality of service and low latency. With the proliferation of more diversified data centres and advanced technologies, comes a renewed need for data centre operators to follow and understand relevant design, build and operational standards, which also play a prominent role in ensuring quality, safety and compatibility.

TEST OF CHARACTER

Standards are agreements on technical characteristics and they can be widely adopted. They are developed to an open, consensus based process and, most importantly, the use of standards is voluntary – although in many markets standards establish minimum functional performance.

It can sometimes be difficult to understand which ones to use when confronted with the many standards and development organisations that are available. Speaking generally, the process when first deciding what standard to use is to make sure you comply with any existing local, regional or international regulations so that you comply with the law.

Other key elements that govern decisions around standard selection are transmission speed, the required distances in the cabling architecture, the kinds of applications that are needed to run, the type of optical fibre and the active equipment required. Crucially, standards protect the end user. They ensure that, for example, when buying an LC or MPO connector you can be assured that it will interoperate with other products that follow the standards.

Involvement in organisations that aren't standard bodies, industry fora and consortia, such as the FTTH Council, European Data Centre Association and Broadband Forum, can also be invaluable as part of the quality process. Often, these are the kinds of groups that develop industry consensus that will then make its way into standards further down the line.

IDENTIFICATION PARADE

Let's take a closer look now at the chronology and lookouts for identifying the correct standards to support technology decisions in data centres. First of all, what kind of standards are governing the typical

Data Rate	40G	
Electrical Form Factor	QSFP+ (4x10G)	
Transmission	Duplex	Paral
MM OM3/4	BiDi (150m) SWDM4 (350m)	SR4 (1! eSR4 (4
SM	LR4 (10km) FR4 (2 km)	PLR4 (1 PLRL4 (
Optical	2λ @ 20G 4λ @ 10G	1λ @ '
Connectivity	2F, LC	8F, M

*red = non-standard solution

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data centre cabling infrastructure we see today? One of the most prominent is the Institute of Electrical and Electronics Engineers (IEEE), which covers many types of electronics that are used in this of different solutions that a customer can choose from, even going up to 800Gb/s. In the design process the standards provide important intelligence on how future ready these initial decisions are. A data centre

|	100G					400G				800G	
	QSFP28 (4x25G)		SFP56-DD (2x50G)		SFP112 (1x100G)	QSFP56-DD or OSFP56 (8x50G)		QSFP112 (4x100G)		QSFP112-DD or OSFP112 (8x100G)	
	Duplex	Parallel	Duplex	Parallel	Duplex	Duplex	Parallel	Duplex	Parallel	Duplex	Parallel
(50m) (100m)	BiDi (100m) SWDM4 (100m)	SR4 (100m) eSR4 (300m)		SR2 (100m)	VR (50m) SR (100m)	DR4 (500m)	SR4.2 (100m) SR8 (100m) VR4 (50m) SR4 (100m)		VR4 (50m) SR4 (100m)		2x 400G-VR4 (50m) 2x 400G-SR4 (100m)
(km) (km)	CWDM4 (2km) LR4 (10km)	PSM4 (500m)	DR (500m) FR (2km) LR (10km)		DR (500m) FR (2km) LR (10km)	2x 200G-FR4 (2km) LR4-6 (6km) FR4 (2km)		LR4-6 (6km) FR4 (2km)	DR4 (500m)	2x 400G-LR4-6 (6km) 2x 400G FR4 (2km)	PSM8 (500m) 2x 400G-DR4 (500m)
100G	2λ @ 50G 4λ @ 25G	1λ @ 25G	1λ @ 100G	1λ @ 50G	1λ @ 100G	4λ @ 50G 4λ @ 100G 1λ @ 100G	2λ @ 50G 1λ @ 50G	4λ @ 100G	1λ @ 100G	4λ @ 100G	1λ @ 100G
MTP	2F, LC	8F, MTP	2F, LC	4F, MTP 2x 2F VSFFC	2F, LC	2x 2F VSFFC 2F, LC 8F, MTP 4x 2F VSFFC	8F, MTP 16F, MTP	2F, LC	8F, MTP 4x 2F VSFFC	2x 2F Mini LC 2x 2F VSFFC	16F, MTP 2x 8F, MTP 8x 2F VSFFC

environment.

The IEEE is one of the first reference points to guide the customer into what kind of fibre they're going to use. Each of the standards shown above are Ethernet standards, with the ones in black governed by the IEEE and the ones in red representing solutions not recognised by the standards bodies.

These options vary depending on transmission speed – from 25Gb/s all the way to 400Gb/s – and there is an array operator can easily see that from 25Gb/s all the way up to 400Gb/s, for example, 100m solutions are available. So, if they were to design a data centre of maximum length connections of 100m with 100Gb/s, they could get confirmation that the system is already covered up to 400Gb/s.

Transceiver models are available for both singlemode and multimode fibre, referenced on the left hand side of the table, for a mix of duplex and parallel technology. The former has the advantage of high information carrying capacity, low attenuation and low fibre cost, but multimode has the advantage of low connection and electronics costs, which may lead to a lower overall systems cost.
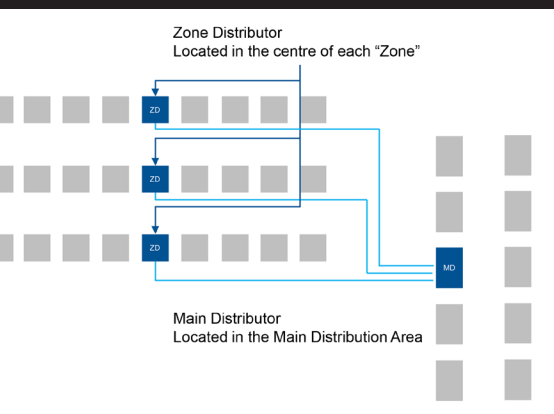
SIX PACK

The next key decision is around how to approach the cabling. The ISO IEC, commonly used across Europe, is broken up into six parts with 11801-1 being the base document for all the others, covering the general requirements for twisted pair copper cable and for fibre with 11801-5,

Zone Distributor
Located in the centre of each "Zone"

ZD

ZD

ZD

MD

Main Distributor
Located in the Main Distribution Area

which covers the standard for data centres.

The key areas for the data centre standard, at a high level, include the requirements for general cabling structure, channel and link performance, cable requirements and connecting hardware in the different zones, external network interface (ENI), main distributor (MD), intermediate distributor (ID) and zone distributor (ZD) amongst other elements.

'With the proliferation of more diversified data centres and advanced technologies, comes a renewed need for data centre operators to follow and understand relevant design, build and operational standards, which also play a prominent role in ensuring quality, safety and compatibility.'

distance to cover, this will impact the decision to use multimode or singlemode, based on the availability and choice of transceiver.

The user would then take a more detailed look at the cabling system. Most data centre operators will favour pre-terminated solutions for duplex or parallel optic systems, as they provide not only advantages in installation speed, but also stable high quality connectivity with factory polished and tested products.

Finally, the last step is to make hardware decisions. Most data centre operators typically prioritise high density hardware. Space is at a premium and without a flexible cabling plan capable of easily accommodating common moves, adds, and changes (MACs), future network growth will be limited. Speaking about hardware, you have components including housings, modules and panels, patch cords and harnesses to connect switches to switches or switches to servers.

MAKE THE CONNECTION

The next step then is to consider which products to choose in line with the standard requirements, for data centres this is mainly fibre optic hardware and connectivity. Depending on the required

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Application	Hardware Type	Reason	Product Representation
MDA (Main Distribution Area)	Rack-mountable housings	Provides interconnect or cross-connect capabilities	
ZDA (Zone Distribution Area)	Housings mountable in racks or raceways	Module support	
Connection method for Inside Plant (ISP)	Cassettes, modules and adapter panels	Ease of use	
		Support of various applications	
Connection method to end-electronics	Patch cords and harnesses	Integration with electronics	

GUIDING LIGHT

Standards help to prescribe the way that a data centre network architecture is designed, offering

guidance on which product selections to make based on current and future needs. They ultimately play an important role for the end user, ensuring products are comparable across manufacturers, protecting their investment. With network performance more important to business success than ever before, and an ever growing range of solutions to choose from, it's critical that data centre operators take careful stock of the latest data centre design standards and use them to guarantee a secure, reliable and consistent service. ■

DAVE KOZISCHEK

Dave Kozischek is standards manager, global technical and industry standards at Corning. With more than 30 years of experience in communications technology, he is responsible for the development, coordination and communication of Corning's standards strategy across the company's optical fibre, cabling and connectivity products.

Inside*out*

Gary Bernstein of Siemon reviews the recent work of the IEEE and explains why OM5 cabling is not necessarily the best choice for supporting next generation speeds

▶ Data networks have been facing unprecedented pressure over recent years to keep up with the intense demands of emerging bandwidth hungry applications, device generated data volumes and cloud based business and storage solutions. And this trend continues.

MISSION CRITICAL

It is the mission of groups such as the IEEE and the Ethernet Alliance to closely monitor how data trends develop and shift over time. So called 'roadmaps' provide clear indicators for what future speeds may become available and when, although adoption rates typically move at slightly different cadences as users and vendors adjust to these changing landscapes and standards requirements.

Back in December 2017, the IEEE 802.3bs standard for 200Gb/s and 400Gb/s Ethernet was approved. This included 400Gb/s supported over eight lanes of multimode optical fibre to 100m and 200Gb/s and 400Gb/s supported over four lanes of singlemode fibre to 500m. One year later, the IEEE 802.3cd standard defined 200Gb/s over four lanes of multimode fibre to 100m and in early 2020, IEEE 802.3cm defined 400Gb/s over eight lanes of multimode fibre, as well as over four lanes of multimode fibre using short wave division multiplexing (SWDM).

BEYOND 400GB/S

With speed requirements swiftly moving beyond 400Gb/s, the IEEE Beyond 400Gb/s Ethernet Study Group – which transitioned to the IEEE P802.3df 200Gb/s, 400Gb/s, 800Gb/s and 1.6Tb/s Ethernet Task Force in December 2021 – is currently working on defining physical layer specifications to support 800Gb/s and

1.6Tb/s. The latest list of objectives as of this writing includes:

Defining physical layer specification that supports 800Gb/s operation:
- Over 8 pairs of multimode fibre with lengths up to at least 50m and up to at least 100m
- Over 8 pairs of singlemode fibre with lengths up to at least 500m and up to at least 2km
- Over 4 pairs of singlemode fibre with lengths up to at least 500m and up to at least 2km

- Over 4 wavelengths over a single singlemode fibre in each direction with lengths up to at least 2km
- Over a single singlemode fibre in each direction with lengths up to at least 10km and up to at least 40km

Defining physical layer specification that supports 1.6Tb/s operation:
- Over 8 pairs of singlemode fibre with lengths up to at least 500m and up to at least 2km

There are obviously many objectives in

'The truth is that for the majority of current and future multimode IEEE applications – including 40GBASE-SR4, 100GBASE-SR4, 200GBASE-SR4, 400GBASE-SR8 and future 400GBASE-SR4 – the maximum allowable reach is the same for OM5 as for OM4 cabling.'

scope that will complicate the development of this standard and could potentially delay the final publication. The task force is working to streamline the process in order to complete the standard in a targeted timeline of Q3 2025.

SINGLEMODE OR MULTIMODE?
With IEEE standards for 100Gb/s, 200Gb/s and 400Gb/s approved and with 800Gb/s applications in development, the question is can the current installed base of cabling infrastructure easily support migration to higher speeds? Or is a new standard of fibre infrastructure required? These questions have led to many discussions around the role of OM5 cabling.

After the introduction of SWDM technologies came the development of an OM5 fibre type. This is now often cited as a potential new option for data centres that require greater than 100m link distances and higher speeds.

FACT FINDING
The truth is that for the majority of current and future multimode IEEE applications – including 40GBASE-SR4, 100GBASE-SR4, 200GBASE-SR4, 400GBASE-SR8 and future 400GBASE-SR4 – the maximum allowable reach is the same for OM5 as for OM4 cabling. There are only three current Ethernet applications that state an additional 50m reach with OM5, but larger
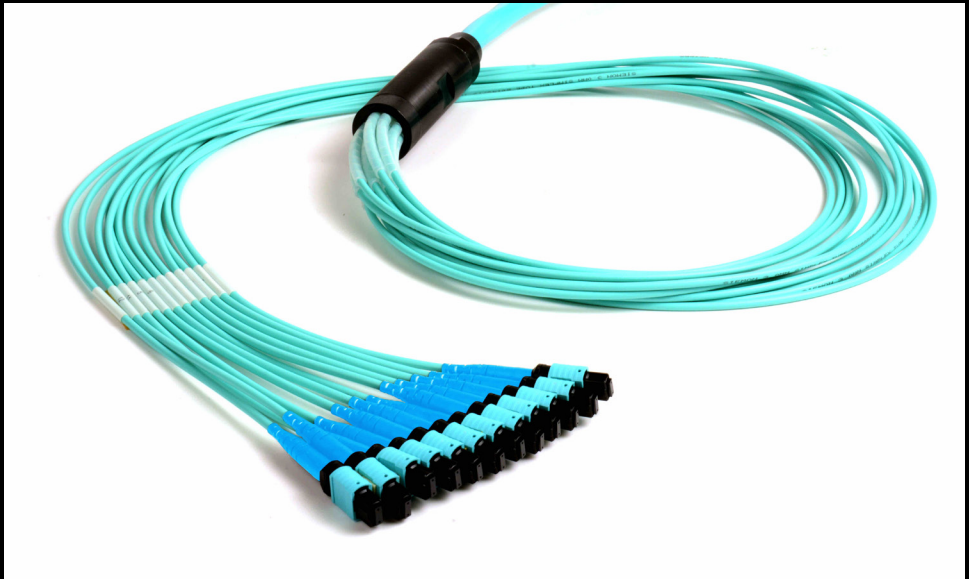
enterprise and cloud data centres that have cabling runs over 100m are likely already utilising singlemode fibre for 100Gb/s and greater speeds.

As for OM5 supporting higher speeds, the same applies. All of the current and future IEEE standards in development for 100Gb/s, 200Gb/s, 400Gb/s and 800Gb/s will work with either singlemode (OS2) or multimode (OM4). The majority of these next generation speeds will require singlemode.

FUTURE PROOF

With any new technological development, there are challenges to overcome and unmapped routes to be travelled. Even if for some organisations these speeds may currently not be in the mid- to long-term view, these advancements made will only improve options when they migrate to higher speeds in the future. ■

GARY BERNSTEIN
Gary Bernstein is global data centre solutions specialist at Siemon. He has more than 25 years of industry experience and extensive knowledge in data centre infrastructure, telecommunications and copper and fibre structured cabling systems. He has been a member of the TIA TR42.7 Copper Cabling Committee, TIA TR42.11 Optical Fiber Committee and various IEEE 802.3 taskforces and study groups.

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Excel Networking Solutions

Excel Networking Solutions' range of pre-terminated optical fibre systems includes distribution, breakout and mini breakout cables, MTP solutions and ruggedised assemblies. They are all designed for simple and quick deployment, manufactured to the highest standards and are fully tested before being delivered to site.

Excel's pre-terminated assemblies with ruggedised fan-outs are constructed from multicore 900 micron, tight buffered or loose tube cables to best suit the application. These fibre assemblies are also available on robust steel redeployable cable drums that are ideal for transporting and deploying the cables into temporary applications, where they can be quickly and easily wound back on to the reel and used again.

These ruggedised assemblies are extremely robust, yet compact and flexible in design. This, together with the range of cable options, core counts and connectivity options available makes them ideal for use as links from a patch panel to a switch, panel to consolidation points, or rack to rack links.

For more information **CLICK HERE,** to contact the sales team call 0121 326 7557 or to send an email **CLICK HERE.**

www.excel-networking.com

Cable Management Warehouse (CMW)

Deploying and maintaining an optical fibre infrastructure needs to be a routine, not a challenge – simple, easy, fast and cost effective.

Available from CMW, the new versatile midsize fibre optic closures from Micos Telecom are designed with the FibeRoad System inside. This 'rock solid' closure will simplify deployment, maintenance and control your costs.

Closures can be configured to address a wide range of fibre optic splice and/or connectivity applications for passive optical network (PON), gigabit PON (GPON) and 5G networks. The design provides IP65 protection from water/dust ingress and is IK10 impact resistant to keep your critical network connections safe inside. Units are lockable, with quick clip closures providing a safe and secure way to protect fibre optics.

They are also PIA compatible and suitable for aerial installations with the use of a handy bracket to mount on to a pole.

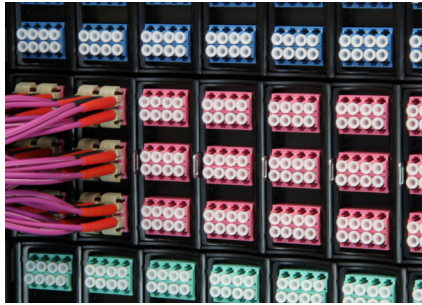**CLICK HERE** to find out more.

www.cmwltd.co.uk

www.cmwltd.co.uk

Patch Solutions

In partnership with Zettonics, Patch Solutions provides an easy to deploy cassette solution, revolutionising your optical fibre infrastructure at a fantastic price point!

The 1U chassis takes five cassettes, allowing data centres to quickly install 120 LC singlemode or multimode fibres in a tool-less one click installation from either the front or back of the chassis. Each cassette has an option of a single 24 core or two 12 core MTP connections, with cables supplied in the requested lengths and polarities. The solution works just as well with traditional tight buffered pre-terminated cables, using a gland installed on the cassette backplate, instead of MTP adaptor(s).

In larger installations, a 2U chassis can house 12 cassettes, providing 288 fibres (144 duplex) OM4 or OS2 adaptors. Options are also available for SC, SC/APC and Category 6A cassettes, all interchangeable in either chassis, creating a fully adaptable system for moves and changes as business applications grow.

The Zettonics solution is competitively priced and available immediately. For more information **CLICK HERE** or call our knowledgeable sales team on 01442 890890.
patchsolutions.com

Trend Networks

FiberMASTER from Trend Networks is a series of seven affordable optical fibre testing products to measure, troubleshoot and certify. A handheld OTDR, PON OTDR, power meter and light source, and inspection probe provide dependable test results, while saving time and money. The series features industry leading dynamic range, enabling users to test longer fibres, PON systems and to maintain accuracy on high loss fibres.

The compact, touchscreen FiberMASTER OTDR, available in quad, multimode and singlemode models, is designed for Tier 2 fibre cable certification and offers access to a wide range of key troubleshooting data. Meanwhile, the high quality power meter and light source kit provides reliable, instant results to identify how much loss there is on a cable. These testers work seamlessly with the FiberMASTER video inspection probe.

The entire range gets users up and running faster, conducting accurate tests, while costing more than 50 per cent less than other premium brands.

To find out more **CLICK HERE.**
www.trend-networks.com

Networks Centre

Networks Centre recently opened a new 25,000ft² warehouse in West Sussex dedicated to optical fibre cables. Alongside sister company, Comms Centre, they are now jointly the largest stockist in the UK for fibre cables. This sales growth has been due to several factors:

- 2021 saw the addition of two new business hubs in Glasgow and Amsterdam, both with local warehousing, reaching new markets.
- The success of both Networks Centre and Comms Centre in winning traditional data centre and enterprise business.
- The unbundling of the BT local access network, with the associated FTTX market accelerating growth, which the group is ideally placed to capitalise on.

Networks Centre and Comms Centre can respond rapidly to customer demands and avoid the delays associated with sea container shipments. Networks Centre has also moved away from plastic drums and packaging, working with manufacturers and customers to reduce waste.

With services like cable cutting and re-drumming, project inventory stocking and call-offs, same day dispatch and expert product knowledge, Networks Centre has the complete fibre optic cable solution.

CLICK HERE for more information, call 01403 754233 or to make contact online **CLICK HERE.**
www.networkscentre.com

Siemon

Siemon boasts a comprehensive fibre optic splicing portfolio that is designed to provide industry leading solutions for various installation environments.

OptiFuse pre-polished fusion splice-on connectors provide a quick and reliable field installable solution with superior fusion splice performance to support high speed applications. By integrating the splice point into the connector, installation time can be up to 30 per cent faster than with pigtails.

LightBow is Siemon's mechanical splice solution that reduces termination time, prevents fibre end face contamination and airgaps. It enables easy verification of termination quality and is an ideal choice for industrial installation environments.

Quick-Pack fibre splice cassettes are designed for use with Siemon's expanded RIC enclosure, eliminating the need for dedicated splicing trays, while improving accessibility to individual splices. The 5U rack mountable fibre splice enclosure is ideal for fibre transition environments, whilst providing additional storage and protection for splice trays.

To find out more **CLICK HERE.**
www.siemon.com
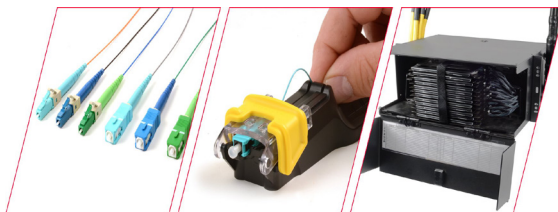
Netscale Solutions
Delivering the highest fibre density

R&M's Netscale solutions combine unmatched fibre cable management with automated connectivity tracking and an innovative tray design to deliver the world's highest port density for 10/40/100G Ethernet.

R&M

HellermannTyton

HellermannTyton is an established and innovative global leader in the provision of optical fibre network infrastructure solutions, delivering a broad range of quality, high performance connectivity for both residential and commercial use. The company supplies a range of FTTX solutions for 'to the home' and 'to the building' fibre connections.

The AFN and FFE are 24 and 12 fibre enclosures that are designed for deployment in the FTTX network. Both can be wall or pole mounted and used in various fibre network applications. These two products offer flexibility and are available in several configurations.

The MCCE and CCE are smaller fibre enclosures, designed as building entry points, providing a fibre termination and network demarcation point external to connected property in a FTTH network. The CCP can be wall mounted or positioned in an underground chamber at the property, providing an external building entry point and network test point.

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

EDP Europe

Flexible end to end Huber+Suhner data centre optical fibre connectivity solutions are available from stock at EDP Europe.

From bulk fibre that can be cut and supplied to length, cabling distribution racks (CDRs) that provide backbone and meet me room connectivity, through to high density 19-inch IANOS modular connectivity and a flexible MTP offering that enables polarity flipping and pin reconfiguration, EDP Europe can support your data centre fibre network with future proof technologies off the shelf.

Data centres can scale their growth efficiently and cost effectively by deploying leading edge, scalable, modular connectivity systems that provide future proof solutions from day one. The flexibility offered by Huber+Suhner's CDRs, IANOS and MTP Pro solutions offers a comprehensive foundation from which a data centre can grow on demand and in parallel to its customers' current and future requirements.

CLICK HERE to find out more, call our sales team on 01376 501337 or **CLICK HERE** to send an email.
www.edpeurope.com

Comtec

Comtec, part of ETC Group, offers a wide range of external grade telecoms optical fibre cable aimed at carrier networks, altnets and service providers. The range includes ultra-lightweight cables (ULW), micro EPFU fibre bundles, blown fibre cables and traditional external duct fibre cables for push/pull installations.

We have ULW for overhead PIA installations in fibre counts from 4f to 48f (don't forget to ask us about our PIA cable clamps), micro blown EPFU fibre bundles from 4f to 12f in 2km PAN sizes in G652D and G657A1, which are suited to blowing in 3.5mm ID tube. In addition there is micro blown fibre and external duct fibre cable from 48f to 288f in 4km drum lengths as standard.

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Playing outside the box

Sean McCloud of Leviton Network Solutions explains the key considerations when extending the reach of a network infrastructure to maximise the life of an existing optical fibre cabling system

▶ Extending the reach of a network infrastructure can bring big benefits but may also lead to concerns about the passive channel's bandwidth capabilities and attenuation loss in relation to transceiver transmit power and receiver sensitivity. Let's take a closer look at extended reach considerations.

WHAT IS IT?
Extended reach refers to a cabling infrastructure that exceeds the maximum length as defined by industry standards. It can also refer to a topology with many connections. This may contribute to exceeding the maximum channel loss allowed by the target Ethernet or Fibre Channel application, affecting performance. There are several main reasons why data centre managers might consider extended reach designs:

• Legacy cabling infrastructure
Network managers may choose to reuse an existing cabling infrastructure as a simple cost saving measure, or due to an inability to replace or upgrade because of downtime or pathway issues.

• Technology upgrades: transceivers
Tech refreshes may occur where the new application has a shorter functional operational distance than the currently deployed application, per industry standards. For example, say a network manager has an OM3 trunk that is 250m long and mated to MPO to LC modules, providing connection between two buildings, as shown below. 10GBASE-SR transceivers were previously used, having a standard based operational length of 300m. An upgrade to 25GBASE-SR transceivers is desired, but the standard based length limit drops to 100m. The network manager would be seeking confirmation that 25GBASE-SR will be supported over the existing cabling infrastructure, even though the length exceeds what is defined in industry standards.

Patch Cord

Transceiver

MPO to LC Module

OM3 Trunk

10GBASE-SR   250 Meters

25GBASE-SR   100 Meters
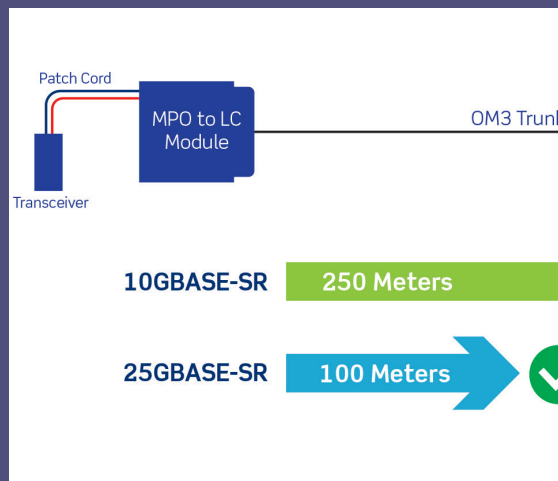
• Technology upgrades: hardware additions
Some technology updates introduce additional fibre optic components such as cassettes, harnesses or adaptor plates. This increases the number of physical matings within the channel, potentially exceeding industry standards for length limits and attenuation loss. Similarly, a different fibre grade may become necessary, such as OM4, OM5, or OS2. These changes could require additional patch points, resulting in loss in the channel or exceeding the standards based maximum length.

• Competitive product responses
Consultants and bidding contractors are often required to validate that their proposed design and product offering will meet performance requirements to a user specified distance, topology or data rate.

ROOM FOR IMPROVEMENT
There are numerous factors that can limit extended reach including the maximum performance loss of components, the number of components or matings in the channel, fibre grades (OM3, OM4, OS2), transceiver choices, the quality of the

products used and installation practices. However, data centre managers can work with infrastructure manufacturers to improve performance through some of the approaches below:

• Engineered links
Standards based links set limits on factors such as maximum allowable loss in the channel, individual components and connector matings. Engineered links are designed to allow additional matings or components that are evaluated and configured to meet a target application.

• Factory controlled product
Product that is manufactured in a controlled environment using commercial grade assembly, termination and test equipment yields a superior and repeatably performing product. In comparison, field termination typically results in lower performing components with a higher degree of variability.

• Typical loss versus maximum loss performance
Maximum loss is the standards based loss limit for cables, connectors and mated pairs. But factory terminated components often have significantly lower loss values and historically traceable data that allows for proven repeatable values – known as typical loss – to be used when estimating link loss and extended reach capabilities.

• Number of components/matings in the channel
With today's lower loss factory terminated products, the impact of each mating in a channel is greatly reduced. While additional loss is added with each additional mating, factory terminated components have a relatively small increase in total attenuation

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Transceiver

k Cable

MPO to LC Module

Patch Cord

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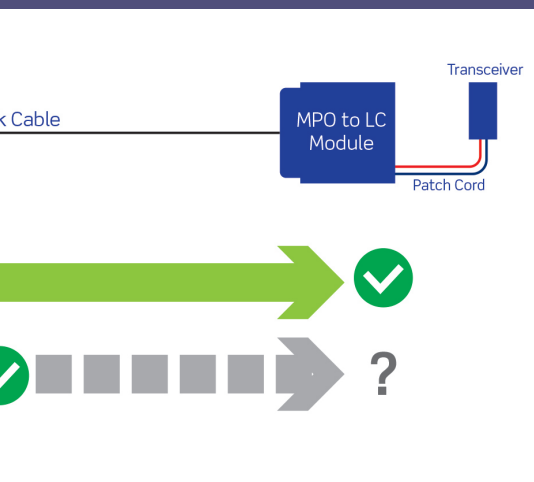
as additional components are added to a channel.

GO FIGURE

The installation and quality of components in the channel is important to the performance of all deployed passive infrastructure systems. When attempting to extend reach or add connections to a channel, it is critical that these systems be installed in an acceptable state for lowest possible loss. Any underperforming product goes against the overall operating budget already being impacted by extended reach requirements. Key installation practices include connector cleanliness through 'inspect before you connect' habits and standards compliant installation practices.

There are numerous

'When considering extending the reach of your network, it's important to have a full understanding of current and future data applications, target application transceiver specifications and a careful analysis of the performance capabilities of the passive cabling infrastructure.'

variables when evaluating an extended reach design. These include calculating the connector insertion loss of all channel components, the attenuation of channel length by fibre type, and the maximum allowable transceiver loss by applicable standards or manufacturer specifications. It is helpful

to work with a network infrastructure provider that has data centre designers or applications engineers who can offer a detailed evaluation of current and future infrastructure to help clarify your options and create the ideal network moving forward.

GET HELP AND PLAN AHEAD

Balancing budgetary considerations, operational costs, migration strategy and system performance can be a complex process. When considering extending the reach of your network, it's important to have a full understanding of current and

future data applications, target application transceiver specifications and a careful analysis of the performance capabilities of the passive cabling infrastructure. In addition, a smart data centre strategy will anticipate network upgrades in the near future. If you are installing a cabling system today and the need is for 10Gb/s server connection, consider cabling that will support at least 25Gb/s in the future. Strong consideration should be given to transceiver types and singlemode fibre grades that are better suited to handle either extended distances, higher data rates or both. ■

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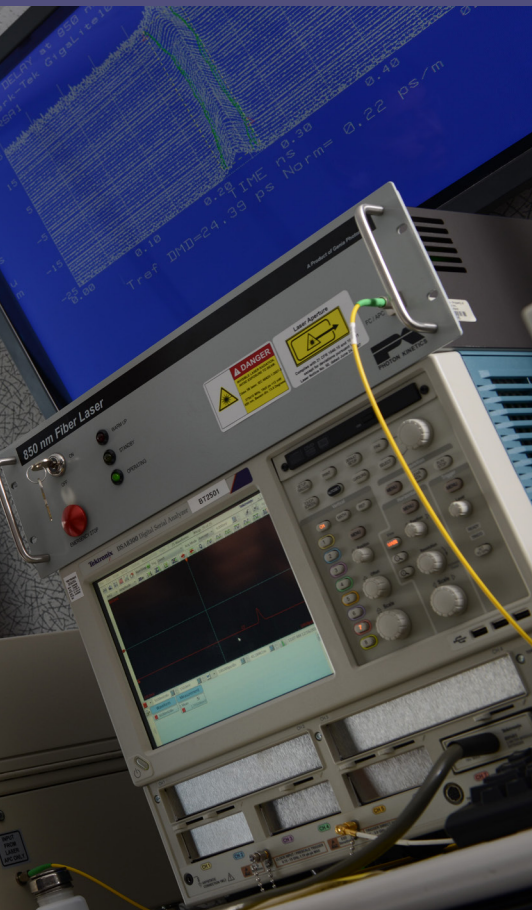
SEAN McCLOUD

Sean McCloud is principal applications engineer at Leviton Network Solutions. He has nearly 25 years of experience in the cabling industry and his current responsibilities involve fibre optic product design, manufacturing and testing. McCloud enjoys providing advanced level support to clients and contractors installing fibre optic networks, as well as offering industry professionals education and training.

The appliance of science

Although he kicked off his career in scientific instrumentation, Michael Akinla has risen through the ranks to become a respected thought leader within the world of network infrastructure. Rob Shepherd recently caught up with him to find out more about his life and career, and his views on the current state of the sector

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

MA: I'm UK and Ireland business manager at Panduit, which is the culmination of the many roles I have traversed during my time at the company. My career here began at the turn of the millennium, starting off in sales then progressing to the technical team. In 2019, I returned to a sales role to manage the UK and Ireland sales teams, and I believe that this is where I belong.

RS: What motivated you to join the IT industry, and what excites you about it at the moment?

MA: I graduated with a science degree and started my working career in atomic spectroscopy. When I graduated, this led me into that market, where we were witnessing the growth of networked instruments and the increasing volume of data that we could collect, analyse and share. However, after a couple of years and a company switch, a career change opportunity occurred and it was a question of whether to stay in science or chance my arm in the IT field.

I was fortunate enough to be offered roles in both Marconi and Panduit and after consideration decided on Panduit. I count myself lucky, as six months later the Marconi division I might have joined closed. My background in evidence based actions proved right, which has remained central to my character in both sales and technical roles. When I joined the company, there was a feeling of untapped potential in the market and that excited me. Today, data has fixed its position as the fourth utility in any modern economy and the potential of the IT industry that supports this growth is immense.

RS: What challenges do vendors of copper and optical fibre based network infrastructure solutions face at the present time?

Currently, we see a highly volatile marketplace in respect of raw material costs in terms of copper and plastics, which is compounded by increasing shipping container costs and extended supply timelines. However, the expansion of the data infrastructure market across the globe continues to accelerate,
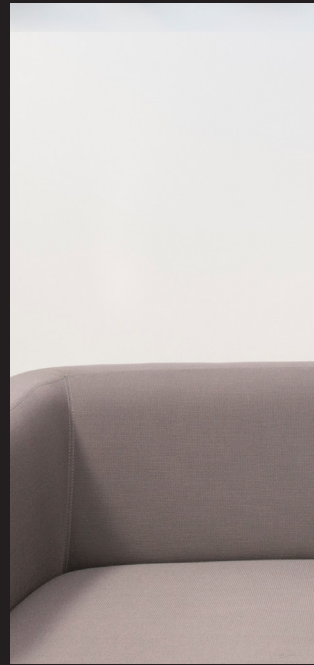
creating massive demand. There are strong underlying drivers behind this growth that go beyond these shorter-term negative factors. The coronavirus pandemic initiated a data explosion and there is no evidence that upward growth is slowing down.

Many material suppliers and manufacturers have shifted in varying degrees to just in time manufacturing, which means that organisations no longer

locally may not be locally produced.

The current perfect storm of raw material, supply lines and demand feed into each other. We need a period of stability to allow us to get some equilibrium into the market supply equation and bring an element of normality back to the industry.

RS: Do end users give enough consideration to physical infrastructure and what could be done to engage with them more effectively?

There are many customers we work with who are very involved and show a high level of consideration. Although, as you suggest, there are also customers who have their focus elsewhere and simply want a solution to a problem. They expect the supplier to have the capability to understand their situation, through discussions and experience, and provide the answer.

A collaborative approach creates a learning culture where all sides are looking for solutions rather than problems. Customer input contributes critically to many of our end market products, and this can only be done through collaboration. There are various customers who have been instrumental in the development of products, where we have worked together to develop

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keep the levels of stock and components needed for even a minimal period of short supply. The global market has seen this acutely in the semiconductor business, which has impacted so many other industries. All industries operate on extended supply lines due to the global nature of trade – some are discussing shortening future supply chains. However, the raw materials and components required to produce the final product

a solution that is now generally available. These close relationships allow us a view into their needs and requirements from a customer standpoint and not a development engineers' view of a workplace.

We work closely with many customers in feedback sessions. Here we demonstrate new ideas to them and gain valuable insights for our development process, while also creating relationships that go

beyond the purchasing cycle, and feed into the customers' engaging with the solution from a wider perspective.

RS: Is training given the status it deserves and what more could be done to encourage more people to gain relevant qualifications, certifications and accreditations?

There are various industry bodies that do a great job in providing training, such as CNet Training and BICSI, but to my knowledge there is not a recognised national qualification. In respect of knowledge development, you must be in the industry to know about the training.

The growth of data as an economic driver warrants a level of awareness and involvement with data infrastructure from within the formal education system. Some people may even find it shocking that a country that is one of world's largest data centre markets ignores the opportunity to teach the fundamentals of data infrastructure in its education syllabus. We need skilled people to join our industry and the earlier data infrastructure skills are introduced, the greater the awareness and understanding of the opportunities available in this growing market sector will be.

Far more could be done to implement a structured national or international approach to create an industry standard entry level qualification. This would also generate a wider understanding of the

> 'We need skilled people to join our industry and the earlier data infrastructure skills are introduced, the greater the awareness and understanding of the opportunities available in this growing market sector will be.'

industry, careers and opportunities within it, at a time when there are constant discussions on skills shortages.

RS: What impact has the coronavirus pandemic had on the network infrastructure sector?

I believe the answer turns the question on its head. The data infrastructure industry has had a critical impact on the success of delivering what was required to get us this far through the pandemic.

As organisations and education were locked down, it was the capabilities and capacity of the data infrastructure industry that supported working from home, as well as allowing children to continue to take classes. Fitness, binge watching TV series, as well as shopping, went viral on computer and mobile devices – all supported through data infrastructure.

What's more, network infrastructure provided high speed, high density connectivity for medical research and pharma organisations, with their high performance computers and super computers, to speed the development of vaccines. Artificial intelligence applications also received a tremendous boost in development and market uptake, again utilising data infrastructure.

The pandemic has forced many manufacturers to undertake detailed reviews of their practices and process designs, and supply chain optimisation. We have learnt to travel less, new tools have been developed and deployed to assist us in the aggregation of massive amounts of

data from centralised office to content being consumed locally. This has helped drive the need for new data centres and edge solutions to deliver this network infrastructure growth.

RS: What will be the next big game changer in network cabling?

I believe that Single Pair Ethernet (SPE) has the potential to double the market size, as Ethernet is brought to industrial and building automation applications. It offers simple network integration and the capability for power and data delivery up to a kilometre over the same cable. This will offer a single network technology across businesses, with the collapse of older bus technologies, and movement across to SPE.

Organisations now understand the benefit of intelligent buildings, how energy efficiencies are gained, and how personalised workspaces can improve outputs and support higher performance. Network infrastructure is a cornerstone of sustainable deployment when it comes to commercial office space and the next natural jump is the residential space for intelligent buildings, which again provides massive potential in terms of product volume.

There are numerous housing and apartment developments that are fully data infrastructure ready, whether this is because homeowners demand it or builders understand the direction of market and realise that selling fully data capability will increase demand. Working from home has not gone away, and for millions partial home working will probably be the future of work.

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

My wish would be to raise the profile of the network infrastructure industry. It is delivering economic and digital transformation and yet no one knows it's here! A higher profile would help attract a younger talented workforce, who we need to bring new ideas and fresh thinking to maintain the momentum. This needs strategic initiatives and commitment from government level to invest in the education system to teach the necessary engineering proficiency to a future workforce.

Our workplaces are getting increasingly automated and cars are also taking that direction, so the next logical step is that our homes will follow. We can have completely networked environments within residential communities, and these need the infrastructure to support that capability.

Edge is expanding and when there are local authorities and businesses siting compute hub capability close to residential areas, we can connect deployed networks more easily so that we can work from home with the bandwidth that was previously reserved for offices. This needs long-term strategic planning, which would provide certain guidelines that innovators can adhere to, which then helps speed the process of conversion to a fully data connected nation.

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

Keep an open door, never hide anything – good or bad – and if you say you'll deliver, deliver! These have always run true and it simplifies everything I do with colleagues, partners and customers. If there is a problem, discuss it and figure it out. If there's success share it and enjoy it. It has helped me remain approachable and consistent, and helps me deliver. ∎

Quick clicks

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

The Smart City – What Is It and Where Is It Going? is the question posed in a blog by **Extreme Networks.** **CLICK HERE** to read it.

Solving 2022's Key Data Center Optimization Challenge is a blog by Dean Boyle of **EkkoSense.** **CLICK HERE** to read it.

Fortinet Survey Indicates Gaps in Zero Trust Implementation is a blog by the company's Peter Newton. **CLICK HERE** to read it.

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Demand Response Opportunities For Data Center Embedded Generation And Energy Storage Systems is a white paper from **EYP Mission Critical Facilities** and **i3 Solutions.**
CLICK HERE to request a copy.

Air Cooling Versus Liquid Cooling for Industrial Enclosures is blog from Karl Lycett of **Rittal.**
CLICK HERE to read it.

BCS Integrated Solutions has published its Winter Report 2021-22, which addresses the skills shortage and the ongoing disruption in the supply chain.
CLICK HERE to download a copy.

Shopping for a Network Tester? Six Important Considerations is a blog from Adam Biddle of **NetAlly.**
CLICK HERE to read it.

On a need to know basis

Andrew Stevens of CNet Training examines the role training plays in addressing the digital infrastructure skills shortage

▶ The coronavirus pandemic has changed the digital infrastructure industry in many ways. Despite all the pressures, it has had a positive impact on the attitudes and demand for continued professional development, as well as ongoing education and training.

SHIFT PATTERN

With the obvious need for classroom based training to move towards remote attendance, or online, and all the work needed to transition to this new way of learning, there was also a requirement to further enrich the learning experience. As a result there has been a shift in how technology is used to do this.

Now, traditional in-person practical assignments can be demonstrated live by instructors, on a one to one or group basis, allowing learners to follow with actual kits sent over to them, or within carefully designed virtual platforms that mimic the real world as closely as possible. Whilst this may not be for everyone, it does allow learning to continue and the opportunity to track back to actual live demo as the situation allows.

While some have embraced it, there's no doubt that others have been reluctant to try remote attendance training.

'It is vital that those throughout the digital infrastructure industry realise the challenges that lay ahead and work towards getting young people to recognise and understand the sector. When people from the younger generation gain interest in the industry, it will also naturally address diversity.'

However, the prolonged nature of the pandemic has pushed the sceptics to give it a try, and many of those people have enjoyed the experience. Learners like the fact that it is more convenient in many ways – working from home offers a more relaxed environment, giving people an opportunity to spend more time with their families, as they are not spending time and money commuting to the classroom.

ANALYSE THIS

The pandemic has also highlighted the need for organisations to look at their operational requirements in detail and analyse where improvements are needed. In some cases, it has highlighted knowledge gaps within teams. For example, if they have moved from a three man shift to a two man shift they might have a reduction in the skill set on that shift as a result. Therefore, companies are now looking for multi-skilled engineers, who can be hard to find in these times, not least in terms of the skills shortage that the industry is currently facing.

Another consideration is utilising technology where possible, so this may require a shift to embracing new systems and processes. In terms of the actual adoption of technology, there has been an uptake of the platforms such as Zoom and Teams but there hasn't yet been a significant uptake in any

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real use of technology to make the learning experience massively different from what was already available.

GUIDING LIGHT

A time is coming when people will start to look at education and training and how it can be delivered in different ways. However, there is still a traditional element of people who like to be in a group of other learners and enjoy the fact that they can speak to a colleague or someone else on a program. People learn from each other and the instructor is there to guide individuals through the process – something that is hugely important. People are adapting to the changes and in the next year we will see further strong developments in the field of learning and education.

On the other side of the coin, the industry is in a state of flux due to the global skills shortage. There seems to be a trend of companies poaching staff from each other and then from other industries, such as oil and gas. The margin for operators is not necessarily going up and they are under pressure due to higher expenditure for power and energy, and now they are being challenged with the higher cost of recruitment, salaries, incentives and bonuses etc. It is not sustainable in the longer term, and they need to take a serious look at the talent pipeline. They are beginning to but it will take 10 years to sort, if ever.

CUT AND PASTE

Looking at role profiles, the experience and the educational requirements that are asked for many roles just don't match – there is no reality to it. Recruiters are cutting and pasting from one thing to another and asking data centre technicians to have five years of experience and a BSc (Hons) degree. It isn't going to happen – these people just aren't there.

Data centre organisations have got to look at their demographic – they must look

at the schools around them, they need to build a school/college engagement programme and they must be serious about it. Other industries are doing that and doing it well. The University Technical College (UTC) in Heathrow that CNet Training has partnered with alongside seven other major data centre organisations, is just one example of how industries can come together collectively. It took six years to bring everyone together but it demonstrates that organisations in the industry can work together. But that's only 150 students a year coming out of the college from just one geographical location.

There must be a concerted change in attitude in terms of engaging with schools and colleges to enable this shift to happen and maintain it. It is vital that those throughout the digital infrastructure industry realise the challenges that lay ahead and work towards getting young people to recognise and understand the sector. When people from the younger generation gain interest in the industry, it will also naturally address diversity.

GET THE MESSAGE

If we get the key message right in all areas we can start to really address the issue. For example, all the instructors and staff at CNet Training are science, technology, engineering and mathematics (STEM) ambassadors, and they all work in schools and colleges to promote the industry. We must highlight to young people that their digital lives are run on platforms that they could get directly involved with – and they could have a very enjoyable and fulfilling career as a result. If the message is right, you can draw those individuals into the wonderful world of digital infrastructure, get them into the right mindset and inspire them to want to know more. ■

ANDREW STEVENS
Andrew Stevens is president and CEO at CNet Training. He has been involved in the international telecommunications and data centre industries for the past 34 years, starting his career within the manufacturing and distribution arenas. Stevens joined CNet Training in 1997 as sales director and has been CEO since 2004. He has been an active member of numerous industry trade bodies and has also been awarded a number of industry accolades for his work.

Networks Centre and Comms Centre

Networks Centre and its sister company, Comms Centre, both provide data network related training for the installation and design of copper and optical fibre networks at their modern training suites in Kent and West Sussex. Offering choice to customers in the region with the highest density of data network companies avoids unnecessary travel and accommodation expense where practical hands-on training is required.

Hosting City & Guilds Level 1, Level 2 and Level 3 installer training provides a path to the widely recognised Level 3 in copper and fibre. Holders of the new City & Guilds Level 3 qualifications will be accredited full technician status and qualified to certify data cabling networks under the Electrotechnical Certification Scheme (ECS) Network Infrastructure card scheme.

Successful completion of the City & Guilds Level 3 Award in Communication Cabling training automatically qualifies students for the JIB/ECS CSCS card and register scheme. The register is widely accepted as proof of suitability in the data communications infrastructure industry and is a prerequisite for most construction site access.

Training dates are regularly updated on the Networks Centre and Comms Centre websites, or simply contact 01403 754233 to book your place.
www.networkscentre.com
www.commscentre.com

Fastly

Fastly has unveiled its Fastly Academy – an on demand learning centre that is designed to help customers sharpen their skills and appeal to curious developers looking for more information about its products and platform.

As pressure continues to mount for resource constrained developer and engineering teams tasked with creating innovative new experiences in a digital first world, Fastly Academy's self-service, efficient learning environment equips teams with faster onboarding and reduced time to value as they build, secure and deliver more powerful websites and applications.

Fastly Academy includes training for all levels of learners – from beginners who are seeking foundational knowledge of the web, to advanced practitioners looking for more in-depth explanations of platform functionality across Fastly's product lines. As the newest addition to Fastly's educational ecosystem – including technical documentation and the Developer Hub – the Academy's coursework is self-paced, interactive and media rich, with all training featuring a combination of video, text and images.

By giving teams access to various levels of coursework, the ability to set their own training cadence and a view into individual account progress and course completion, organisations can standardise training at scale, allowing them to better leverage Fastly's offerings to build fast, engaging and safe digital experiences.

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

Fast Lane

Fast Lane is committed to delivering the highest quality training on the hottest technologies. Our courses offer a personal approach to learning with vendor certified instructors and the latest equipment available in the classroom. We pride ourselves on delivering a unique training experience that goes above and beyond the standard course materials.

Fast Lane has a number of industry leading experts that are always on hand to help you design, implement and troubleshoot the very latest data centre technologies. Working closely with our specialists we can specifically

tailor the training to suit your requirements, which can be either delivered on-site at your location or at one of our state-of-the-art training facilities.
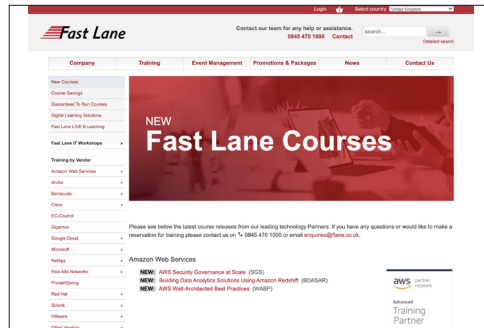
Fast Lane also provides a whole range of authorised cloud, virtualisation and data centre courses. Enhance your skills and abilities to design, install and support a data centre networking solution. Data centre certifications can enhance your technical skills, confidence and the value you bring to your IT department.

To find out more **CLICK HERE.** **www.flane.co.uk**

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CNet Training

CNet Training has announced the launch of the new Certified Data Centre Project Management (CDCPM) program.

The CDCPM program is designed for project managers seeking to employ their knowledge and skills within the data centre project environment. The program teaches how to establish a robust project baseline and a comprehensive plan for a high value, high risk data centre expansion project.

Successful learners gain unrivalled knowledge, expertise and capability to deliver complex data centre projects.

They can work as a critical member of a multidisciplined project team to make a significant impact by exhibiting strong leadership qualities, and can optimise tools and processes to implement effective stage management to ensure product quality and financial control.

With a focus on a 'concept to closure' theme, the CDCPM tailors project management tools to the unique requirements of a critical infrastructure project.

For more details **CLICK HERE** to send an email.
www.cnet-training.com

The shape of things to *come*

Richard Ednay of Optical Technology Training (OTT) examines the effect of the coronavirus pandemic on training, the importance of practical hands-on skills development and what courses might look like in the metaverse

▶ So, what was it that you missed most from the world of work when the coronavirus pandemic turned everything upside down? Perhaps it was the banter around the coffee machine in the office, or being able to meet properly with customers or suppliers to discuss project plans and products in detail. For some people an important thing that they missed out on was the opportunity to attend a real live training course to learn new skills and master new technologies.

PEOPLE POWER
A key element of all of these things is social interaction. As we are basically social animals, these interactions are very important to us in terms of how we feel about things and how we perform in our job roles. Attendance on a live training course provides many opportunities for beneficial social interaction. We can get to meet new people, learn from the expertise of the trainer and often learn something from the experiences of other delegates.

'Through the use of imaginative case studies, it is possible to create an entire virtual optical networking ecosystem with all the products, systems, organisations and characters that can take you on a journey.'

Importantly, we can get feedback on how well we are doing on the course. Expert feedback is a key characteristic of a live course that is critical to the success of the training, particularly in the context of teaching people new practical skills. Of course, this type of constructive feedback goes out of the window completely if we attempt to substitute online self-study type training for good quality practical courses. Without constructive feedback to correct mistakes in the classroom, poor working practices can proliferate into the workplace, where they can result in badly built networks that are unreliable and expensive to operate and maintain.

SUCCESS STORY
In the same way that many practical job roles cannot be performed by working from home (WFH) – fibre to the home (FTTH) installation, for example – many practical training courses cannot simply

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be replaced by online alternatives. So, with telecoms personnel classed as key workers, and with everyone becoming much more dependent upon the telecoms infrastructure for WFH, making sure that there were enough skilled workers meant that some practical training in fibre optics had to continue, albeit with appropriate precautions in place.

Another type of course that is difficult to replicate online is the intense 'boot-camp' style of technical training that works well when there is a complex subject to be covered, which has many interrelated aspects. Optical networking is a good example here. We often use the analogy of a jigsaw puzzle with many different pieces that all have to fit together in order for you to be able to see the big picture and understand fully what is going on.

COMPETITIVE EDGE
On a well-designed and well-structured bootcamp style programme, you'll be

learning together with a team – working your way collaboratively through exercises and assignments. A large part of the learning value comes from engagement and discussions with the other group members, encountering and solving problems together.

Sometimes there will be a competitive element to these exercises – can your team come up with a better, faster or cheaper solution than the others? Again, it is the social interactions that help to boost the benefits of this type of learning programme and can allow mastery of quite complex subjects. The activities and engagement also help a lot with retention of knowledge and the transferability of skills back to the workplace, especially when compared with passive learning styles such as lectures or page-turning presentations.

UNDER PRESSURE
But what if we really cannot get people together for these highly effective and efficient training programmes? Obviously, during the pandemic there has been a lot of pressure to move training on to an online delivery format.

Online training can work well for short and simple tasks, especially ones that are computer based. We may need a quick reminder of how to perform some rarely used spreadsheet function, or how to apply some special format or layout to a

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Microsoft Word document. Asking Google might help sometimes, but expecting the Google search box to come up with a detailed answer to a complex optical networking design problem is expecting a bit much! You might also have spent hours sitting through webinars hoping to gain the answers to your questions, but these are often superficial and biased to a specific vendor viewpoint.

DELIVERY DRIVER
You might even have enrolled on some online training, full of good intentions, but with no social interactions it can be a real challenge to persevere. Just putting training content online does not automatically improve the quality of that material! In fact, putting training online significantly increases the requirement for that material to be of a very high quality if it is to be effective, given the challenges of the delivery mechanism.

But is there a way for us to get engaging interactive training available in an online format? Perhaps we should be looking forward to getting our training in the metaverse. The concept of being able to participate fully and interactively with a group of people in an online event has the potential to provide us with the ideal learning environment. This can be coupled with the social interactions that make learning effective and fun.

VIRTUAL REALITY
In a virtual training world we can set up many different environments to learn different aspects of the technology and apply it in realistic networking scenarios. For example, we could transition from a virtual classroom into a virtual optical networking lab, kitted out with transmission and test equipment to allow us to experiment and try things out like adjusting the gain of a fibre amplifier, or using a reconfigurable optical add-drop multiplexer (ROADM) – all without risk to any real equipment or network.
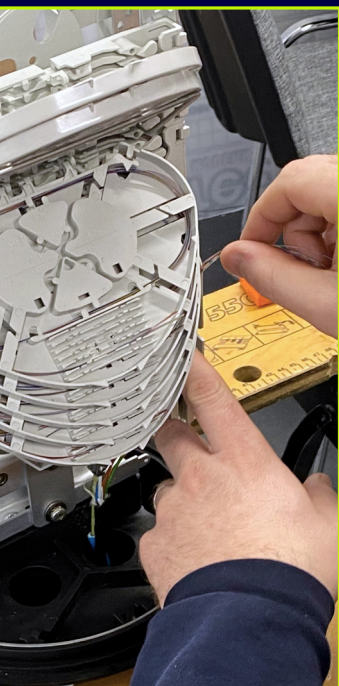
We could then relocate to a virtual version of an operational environment, with our avatars setting-up and configuring

optical networking equipment to connect virtual data centres together. At the same time the avatars of other delegates monitor the activities from the network operations centre, and work with the robots that provide the automatic network functions.

THE ROAD AHEAD

Maybe this is some way off, but what do we need to do to get there? And how do we make sure that the end result is an effective learning experience and not just adoption of some fancy 3D animation just for the sake of it?

In fact, the creation of this virtual world may be closer than you think. Through the use of imaginative case studies, it is possible to create an entire virtual optical networking ecosystem with all the products, systems, organisations and characters that can take you on a journey. This journey can go from the design and development of optical networking products, through to their commercialisation and marketing, to the design and deployment of optical networking solutions to provide communications systems to end users to light up their virtual dark fibres.

POINT OF PRINCIPLE

Of course, it is important to maintain a clear focus on good training principles throughout the design of this ecosystem and the scenarios used to provide the learning experiences. Identifying key tasks and the knowledge and skills that are required to perform them is as crucial as it always has been. Also, it is important to have a really good understanding of the underlying technologies, so that the products and systems in the virtual world can closely reflect the capabilities and limitations of those in the real world. Quite simply, good training is good training, whatever the delivery mechanism. ■

RICHARD EDNAY
Richard Ednay is technical director at OTT. He has been involved with most international standards bodies in fibre optics including the IEC, ISO/IEC and ITU, as well as the TIA.

Vantage Data Centers breaks ground on two additional campuses in Frankfurt and Berlin

With the continued increase in customer demand for premium hyperscale data centre space across Europe, Vantage Data Centers has broken ground on second campuses in both Frankfurt and Berlin.

The five acre Frankfurt campus, located in Raunheim, will provide 40MW of critical IT capacity and total more than 33,000m² once complete. The initial phase of this five story facility is scheduled for delivery in late 2022. Vantage is also continuing to develop its flagship Frankfurt campus, located in Offenbach, approximately 30km from Raunheim. Once fully developed, both campuses will offer hyperscalers, cloud providers and large enterprise customers a total of 95MW of IT capacity in the Frankfurt region.

Vantage has also begun construction of a second campus in Berlin. Located only 20km from its first Berlin campus and 10km from the Brandenburg International Airport, the two building campus will sit on 12 acres and provide 32MW of critical IT capacity. The initial phase is scheduled to be operational in summer 2022.

Kyndryl and NetApp form strategic partnership to deliver critical enterprise data infrastructure to BMW Group

Kyndryl and NetApp have announced an agreement with BMW Group. The agreement combines Kyndryl's digital infrastructure services with NetApp's software technology.

Kyndryl will serve as the lead integrator, applying its expertise and global reach to manage the enterprise storage infrastructure that is critical to the BMW Group's production process. NetApp provides the hybrid cloud data infrastructure foundation for all of BMW Group's data centre needs, delivering network attached (NAS) and scale out storage infrastructure. The deal covers 17 countries on five continents with Germany, the US and China as key markets.

The resilient platform for BMW Group's future data fabric is based on NetApp's solutions and services – a combination that ensures continuous data availability, uninterrupted service delivery and easy data mobility. This allows BMW Group to use data where it is needed to accelerate innovation and gain new insights – whether in the data centre or in the cloud.

Emtelle awarded multimillion pound contract with Upp

Emtelle has been awarded a major multimillion pound contract as the main supplier of network infrastructure for Upp, running until the end of March 2026. Emtelle will work closely with Upp to ensure the delivery of core fibre to the X (FTTX) infrastructure components to support its plans to deploy a full optical fibre network to one million premises by 2025. Over the next five years Emtelle will supply Upp with all of its passive infrastructure products to rollout its networks across the East of England.

Upp is using existing telephone poles where possible to cut back on the amount of disruption to roads and paths. The company is committed to bringing broadband to underserved towns and communities and aims to level up market towns and coastal areas across Norfolk and Lincolnshire to boost the UK's competitive position in the European digital market.

Extreme Networks transforms Borås Stad into smart city

Extreme Networks has established one of the largest cloud managed network infrastructures in Borås Stad, Sweden – transforming the municipality into a smart city. The new infrastructure delivers faster and more advanced connectivity, extending secure public Wi-Fi for its citizens, local government, schools and services, while automating and simplifying network management for the IT team. The transition to smart cities is designed to provide more sustainable resources to residents, while improving quality of life and fuelling business innovation.

Municipalities in Sweden are required by law to provide critical welfare services such as schools, childcare, social services and elderly care. The departments and institutions that power these services require a robust, secure network infrastructure to share information seamlessly and securely. The ExtremeCloud IQ platform reduces the complexity of network management, streamlines operations, lowers maintenance costs, and provides visibility into actionable data and insights from network usage to performance.

Proximity expands UK footprint with Birmingham edge data centre

Proximity Data Centres has further expanded its edge data centre footprint with the opening of Proximity Edge 8 in Birmingham. Situated in central Birmingham, the facility is strategically located to all the major optical fibre networks traversing the UK including BT, ITS, Lumen, Virgin and Zayo, in addition to various regional fibre providers.

Built and accredited to Uptime Institute Tier 3 specifications, the secure and resilient 63,055ft² facility has capacity for up to 2,000 racks in three separate data halls. There is currently 6MW of IT power available, with the potential to increase this to 12MW.

Proximity Edge 8 joins Proximity's expanding UK network of interconnected regional edge data centres, which also includes sites in Bridgend, Swindon, Nottingham, Rugby, Liverpool, Chester Gates and Wakefield. The company expects to have 20 sites available within the next 12 months, all in close proximity to major conurbation areas.

Telehouse set to expand presence in Southeast Asia by opening the most connected data centre in Thailand

Telehouse plans to open Bangkok's first purpose built data centre focused on connectivity, as it continues to expand its presence in the Southeast Asian market. Telehouse, together with parent company KDDI, expects to open the 9,000m² technologically advanced facility with power capacity of 9.5MVA, known as Telehouse Bangkok, during the second quarter of 2023.

Situated in the Rama 9 business district, close to the Stock Exchange of Thailand (SET), Telehouse Bangkok will be close to local carrier network facility locations, enabling customers to optimise their networks more efficiently. As a brand new data centre, customers can expect more scalability and flexibility, not only for their immediate planning requirements but also for future growth.

The new data centre will be the first in the market to offer four diverse routes for optical fibre access. It will also provide redundant power supply with two substations, which is very rare in the market, providing reliable back-up generators in case of a power outage, cooling and 24/7 security systems, giving customers added peace of mind.

PROJECTS & CONTRACTS IN BRIEF

MLL Telecom has won a new five-year contract from Hereford & Worcester Fire and Rescue Service. As part of its managed network services remit, MLL will undertake a technology refresh of the existing MPLS optical fibre network.

Transaction Network Services (TNS) will enable firms wanting direct access to the London Stock Exchange Group (LSEG) to seamlessly move trading operations when the LSEG data centre relocates from its current London City location to a new site this year.

Secure IT Environments has announced the completion of data centre infrastructure upgrades at two hospitals in south west England. Both projects entailed updating 20-year old data centres, one with new air conditioning systems that are projected to save £13,684 in annual running costs.

Over 10,000 homes managed by Swindon Borough Council will be among the first to connect to Swindon's new town-wide full fibre network, giving residents access to faster, more reliable internet services. This is thanks to the signing of a blanket agreement that gives CityFibre permission to connect all Swindon Borough Council properties to the new network it is building across the town.
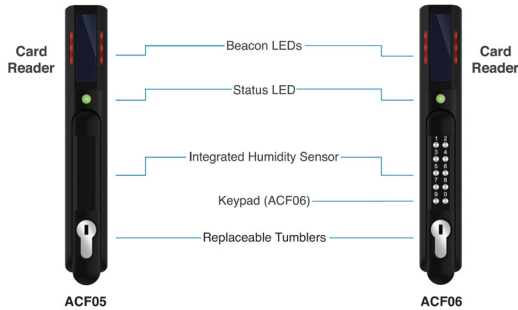
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Panduit

Panduit's SmartZone G5 security handle is designed to meet the most rigorous security challenges in today's data centres. It offers multiple configurations, with and without a keypad, to complement users' operational requirements. The integrated keypad version enables dual authentication by allowing for a card swipe and pin-code combination to access the cabinet.

The SmartZone G5 security handle seamlessly mates with most data centre cabinets and has the capability to read both low frequency (125kHz) and high frequency (13.5MHz) cards. It is designed to be current and future compliant with regulations required within this environment and is also GDPR, HIPAA and PCI-DSS ready.

It can support 200 authorised users and features an integral humidity sensor, allowing humidity sensing to be optimally placed near the centre of the cabinet. The status LED provides visual indication of the handle and security status. The beacon LED is a visual indicator to provide the status of the health of the cabinet at a glance and will flash yellow when the cabinet is in a minor alarm or flash red when the cabinet has a critical alarm.

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

Rittal

2021 was a triple milestone for Rittal – the company celebrated the 60th anniversary of its formation, the 75th birthday of owner, Friedhelm Loh, and production of the one millionth VX25.

On 16th August 2021, the one millionth VX25 enclosure rolled off the assembly line, production of which would not have been possible without the hard work and dedication of the 1,240 employees at the Rittershausen site. Friedhelm Loh and representatives from the company's management team honoured this achievement with a commemorative ceremony.

Three years after its initial launch, the VX25 is now used by industrial and IT customers all over the world. These include automobile manufacturers and data centres, along with cruise liners, wind turbines and in several remote locations, to name a few applications.

CLICK HERE to find out more.
www.rittal.co.uk

R&M

R&M recently acquired Tecnosteel – a leading European manufacturer of 19-inch racks and enclosures for data centre IT equipment and networks, based in Brunello, Italy. The data centre portfolio includes compact distributor and server cabinets, enclosures for computer rooms, and systems for power distributors, cooling and air conditioning, network management and monitoring. R&M is taking over all employees in Italy and France, and is expanding the highly automated Brunello production facility.

The combined product range enables R&M to offer complete, tailor-made infrastructure for data centres of all types and sizes from a single source.

'R&M is further strengthening its market position in the price sensitive project business,' said R&M's CEO, Michel Riva. 'We can acquire larger project volumes and deliver in Europe even faster and more flexibly. The acquisition of Tecnosteel will allow us to perfectly complement our portfolio and benefit from existing customer relationships in Europe.'

To find out more **CLICK HERE.**
rdm.com

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to know

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The circle of life

Andrew Gomarsall of N2S looks
at why extending hardware
lifetimes and ensuring ethical
asset disposal can make data
centres more sustainable

▶ Hyperscale
applications
and business
models continue
to grow
exponentially.
And so does
the resultant
environmental
impact of a vast
and growing
data centre
footprint – from
the superpowered
hyperscale facilities
hosting clouds to
enterprise facilities,
whether on-premises or
colocation. Joining these are
innumerable micro and modular
edge data centres. And the appetite
for yet more IT assets can only continue
to accelerate with 5G communications
technology, artificial intelligence, machine
learning and the internet of things (IoT).

ASK THE QUESTION
With all this to consider, delivering a
net zero solution out of nowhere is
daunting. Data centre leaders need to
ask technology vendors how they are
designing and building sustainable tech for
the future. Demand for this requirement
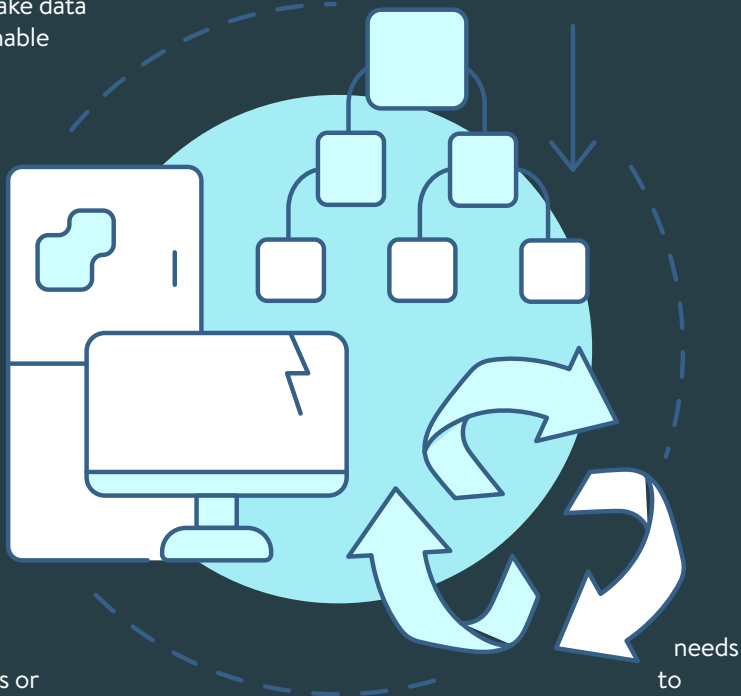
needs
to
increase,
collaboration
needs to happen
across all the technology verticals, and
funding provided to create a truly digitised
circular economy that is driven by green
practices.

Though IT assets, network equipment and
cabling are becoming more energy efficient,
most of the carbon footprint comes ready
wrapped on final product delivery to users –
before powering up. In fact, 70-90 per cent
of it. This is the embodied energy expended
across the supply chain from the sourcing
of raw materials and component assembly

'To maximise sustainability, more enterprise businesses, data centre operators and IT service providers need to act now by implementing zero waste strategies.'

through to product manufacture.

The data centre industry overall is already making huge strides in the race to net zero through more energy efficient buildings, infrastructure and cooling, and renewable power including on-site generation of solar and wind energy. But there is still much more to be done when it comes to maximising the sustainability of IT assets – from PCs, laptops, servers and storage hardware to network routers and copper based cabling. Enterprise businesses, data centre operators and service providers need to be implementing zero waste strategies that optimise equipment lifetimes to reduce overall embodied carbon levels.

TO THE MAX

A circular economy only occurs when resources are kept in use for as long as possible, maximum value is extracted while in use, and materials are sustainably recovered and regenerated at the end of their useful life. Unfortunately, today, it is still very much a linear one-way street economy when it comes to electrical and electronic equipment in general – including enterprise and data centre IT assets.

The default setting of rip, dispose and replace every few years is driving up the exponential volumes of e-waste year on year. This currently stands at more than

50 metric tonnes globally according to the UN's Global E-waste Monitor – the equivalent of 350 large cruise ships.

All of this serves to underline the critical importance of doing everything possible to reclaim and redress the balance in the equipment usage and post-usage phases. The latter is where most of the opportunity lies. By extending typical three to five years product lifetimes through licensed and regulated refurbishment, reselling and reuse, it can add perhaps a further five years.

SMOOTH OPERATORS

Crucially, when beyond useful repair, ethical and sustainable asset disposal should be carried out by licensed and accredited operators. Recovered materials such as gold, copper and steel can then go back into manufacturing streams. Once again they become part of the technology manufacturing process, completely closing the lifecycle loop, or they can be reformed, becoming anything from street furniture to traffic cones. This circular technology solution offers the most secure, sustainable way for enterprise and industry to realise its net zero goals.

A key success factor in effectively closing the loop in the circularity of IT is a scalable and totally sustainable method of extraction and recovery of printed circuit board (PCB) materials.
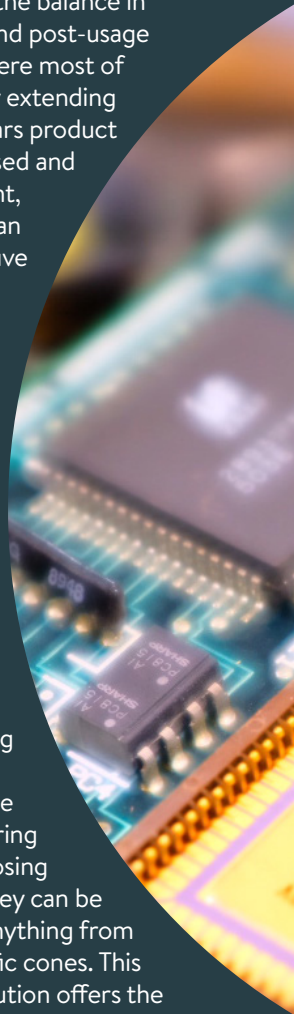
After all, this is where 70-90 per cent of that embodied CO_2 resides. Bioleaching

to be reclaimed, conserved and recycled without the use of harmful acids.

VALUE ADDED

For PCBs alone, the UN puts the value of materials wasted at \$62.5bn per year. PCBs contain up to 40 rare and precious metals including gold, silver, platinum, copper and palladium. Many of the materials used are in increasingly limited supply, or hard to access and are lost due to ritual processes, with a detrimental effect to our planet. A circular economy would drive better quality yields of material. For example, one tonne of iPhones would deliver 300 times more gold than a tonne of gold ore and 6.5 times more silver than a tonne of silver ore. Throughout the technology lifecycle, environmental impact reporting is a vital part of keeping energy usage and emissions on track. For example, a dashboard can demonstrate how an organisation is contributing to UN Sustainable Development Goals by reporting data on the weight and volumes

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is emerging as a game changing solution – bacteria are used to oxidise and leach out the metal content, allowing PCB materials

of technology reused, resold and recycled. Science based metrics provide data on environmental impacts around savings and sustainability, which can be visualised and converted into actionable information.

SOLUTION PROVIDER

A truly circular IT economy is key to the effective reduction of both embodied energy in IT

asset manufacture and the growing mountain of e-waste. To maximise sustainability, more enterprise businesses, data centre operators and IT service providers need to act now by implementing zero waste strategies. Such

an approach will significantly improve enterprise data centres' and colocation facilities' environmental profiles and support compliance with increasingly stringent environmental, social and governance requirements. Further benefits come from saving space rather than holding on indefinitely to equipment no longer required – not forgetting the PR value created and even the financial returns from the proceeds of pre-used assets resold into the market. ■

ANDREW GOMARSALL
Andrew Gomarsall is the chairman of N2S. Prior to joining the company a decade ago, he was a highly successful professional rugby player and England international, and was a member of the World Cup winning team in 2003.

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