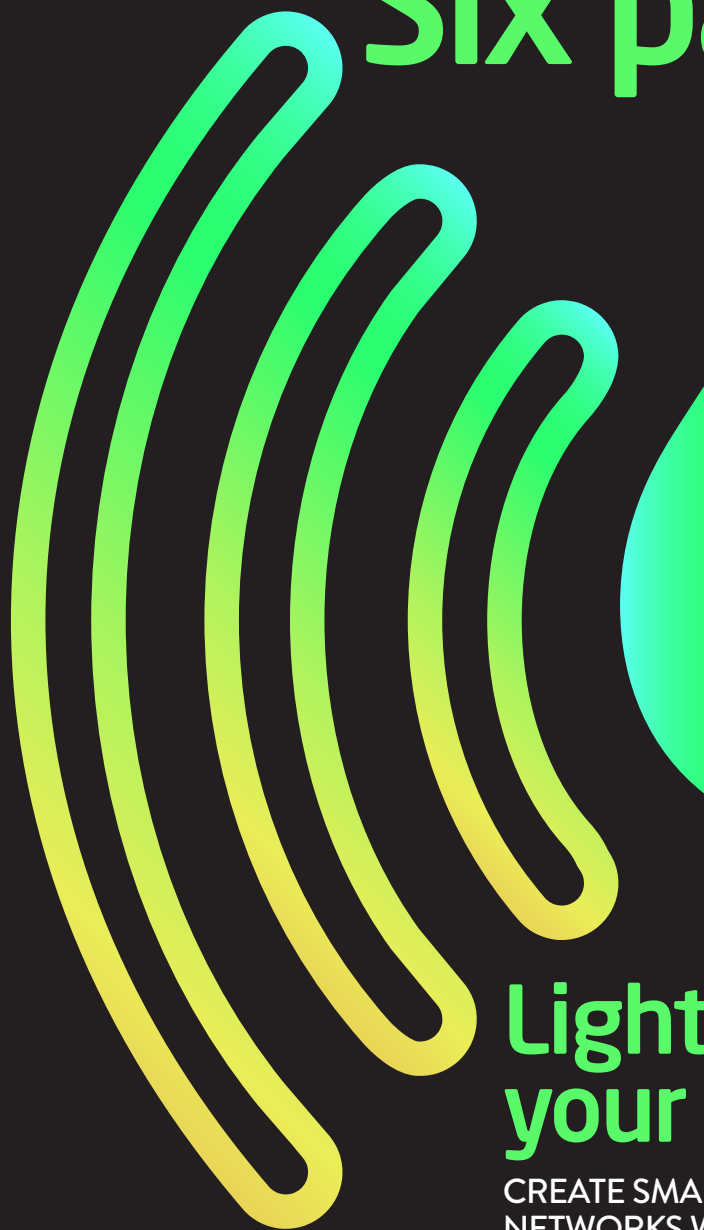# Inside_Networks

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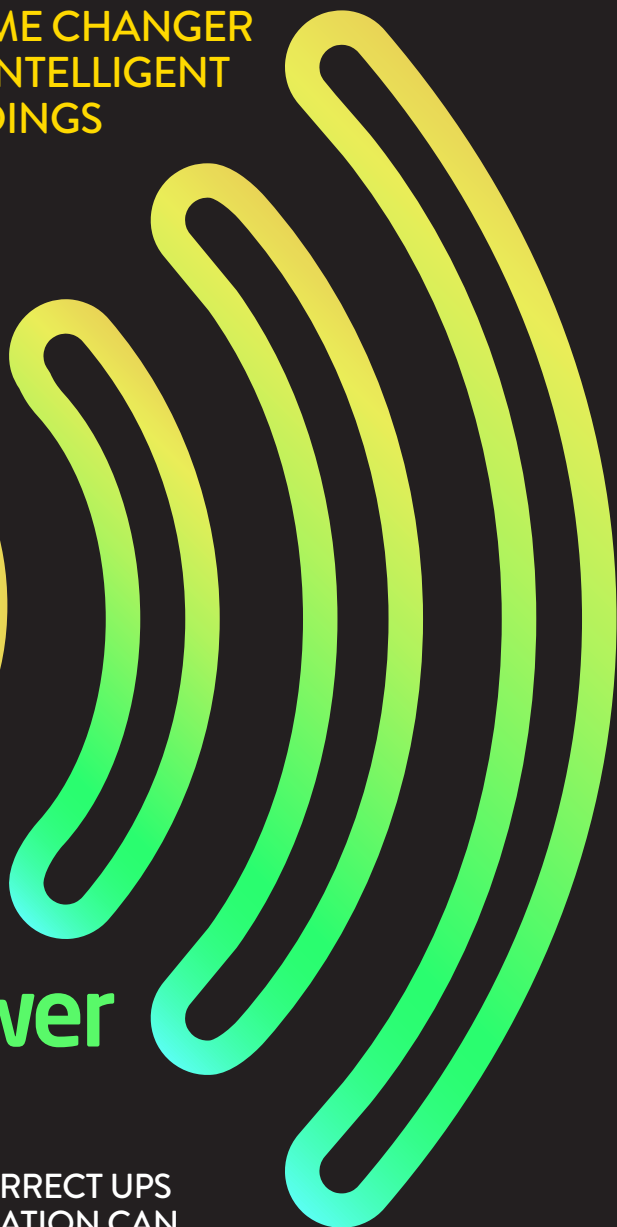BUILDINGS

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SPECIFICATION CAN
PROTECT CRITICAL
INFRASTRUCTURE

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The Global Digital Infrastructure Education Framework Designed and Delivered by CNet Training

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Level 4 — COPT® Certified Outside Plant Technician — Click here for more information	**Level 5 — CDCDP®** Certified Data Centre Design Professional — Click here for more information
Level 4 — CIIT® Certified Integrated Infrastructure Technician — Click here for more information	**Level 5 — CDCEP®** Certified Data Centre Energy Professional — Click here for more information
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End of an era

6

This is an industry that relentlessly looks forward and where change is a constant, but every now and again something happens that makes us reflect and wonder where the time goes. For me, one of these occasions happened last month when HellermannTyton announced that it intends to cease production of Category 5e cable at the end of 2020.

I had only recently started writing about network infrastructures when Category 5e first came on to the market and was subsequently ratified. It certainly caused a great deal of excitement, with Gigabit Ethernet support and an ability to operate at distance without being impacted by crosstalk. It was truly a game changer and there's still a lot of it in use! That said, things move on and I have a feeling that, if they haven't already done so, others will soon be joining HellermannTyton in saying goodbye to Category 5e.

Back to the present and Wi-Fi technology continues to push on, with Wi-Fi 6 set to positively impact the design and configuration of intelligent buildings by allowing multiple users and devices to stay connected simultaneously. To outline the key considerations when specifying a network cabling infrastructure to support Wi-Fi 6, we have assembled a panel of industry experts to offer their advice.

Also in this issue, we have a special features dedicated to pre-terminated systems and UPS and power management. Experts from Leviton, Legrand, Austin Hughes and Vertiv have provided excellent articles on topics including how to design smarter with pre-terminated optical fibre, using MPO cable assemblies, optimising rack power management and specifying UPS systems to protect critical infrastructure from power disruptions.

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

Rob Shepherd
Editor

Inside_Networks
THE NETWORK INFRASTRUCTURE E-MAGAZINE

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In the new world of intelligent buildings, the number of devices that will be connected AND powered via IP will grow exponentially. New developments such as the digital ceiling, will drive this growth.
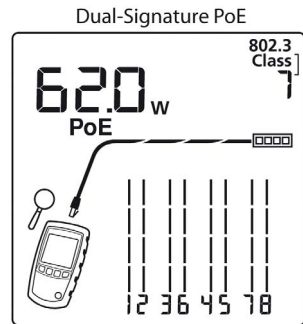
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Equinix reveals the pace at which coronavirus is accelerating digital transformation

The latest Global Interconnection Index (GXI) by Equinix shows that the coronavirus pandemic has had a dramatic effect on how businesses are planning their digital infrastructure initiatives over the next three years.

As the pandemic continues to accelerate the shift to digital, enterprises facilitating more remote working are expected to contribute to 54 per cent of the total interconnection bandwidth growth in EMEA. Frankfurt, Amsterdam, Paris and London are predicted to be the top metros in Europe for interconnection bandwidth growth, with the region as a whole expected to account for 23 per cent of the projected global installed interconnection bandwidth.

The expected growth is driven by digital transformation and, specifically, by greater demands from enterprises extending their digital infrastructures from centralised locations to distributed edge locations. Eugene Bergen Henegouwen, president EMEA at Equinix, said, 'The pandemic has only accelerated the digital transformation journey that businesses across the region were already undergoing. It's now even more critical for businesses to find innovative ways to interconnect with their customers and partners to gain a competitive advantage in an increasingly remote and dispersed environment.'

Eugene Bergen Henegouwen

9

Manufacturers agree that a modern IT infrastructure accelerates innovation, creativity and productivity

A study from Riverbed has revealed that 81 per cent of business decision makers in manufacturing companies are convinced that IT infrastructure plays a crucial role in enabling their organisations to be innovative, creative and productive.

The study also revealed that 40 per cent of business decision makers in the manufacturing sector consider IT investment to be the most important business objective at present, and that a further 35 per cent prioritise digital transformation. This means that IT expansion in manufacturing is currently more important than traditional corporate operations such as financial rationalisation.

Colette Kitterhing

Colette Kitterhing, senior director UK&I at Riverbed Technology, said, 'The convergence of manufacturing plants and IT is creating new challenges, and the opportunities offered by digitalisation are being fully exploited. To ensure that networks and applications deliver the necessary performance and work efficiently, the IT team needs complete transparency.'

Majority of UK firms now looking to AI to bolster their businesses

A survey by Fountech.ai of 430 UK companies has revealed business leaders' perceptions of artificial intelligence (AI) and how the coronavirus pandemic has changed their attitude towards the technology. The research suggests that the pandemic is set to trigger greater investment into AI, with 45 per cent of businesses saying they will implement one or more technologies that use AI in the next 12 months.

However, 53 per cent of companies admitted they have a very limited understanding of AI and how it can be used, with only 15 per cent confident

Nikolas Kairinos

that they have the skills needed internally to implement or take advantage of AI. Furthermore, 44 per cent of businesses believe that AI is overhyped and would not deliver much value.

Nikolas Kairinos, founder of Fountech. ai, said, 'There remains a significant knowledge gap when it comes to businesses' understanding of AI. Our research shows that more companies are evaluating how digital solutions like AI can improve what they do and how they do it. This is a welcome development.'

CNet Training launches its Digital Infrastructure Education Advice Service

CNet Training has launched a new advice and guidance service. The Digital Infrastructure Education Advice Service is designed to assist industry professionals throughout the data centre and network infrastructure sectors with their professional knowledge, certification and qualification progression, and will also help those looking to enter the industry.

The Digital Infrastructure Education Advice Service is headed up by Paul Gorman and Pat Drew who, between them, have over 60 years of experience within the data centre and network

Andrew Stevens

infrastructure sectors. Making use of the new service is easy – individuals just complete a simple online form on the CNet Training website, and a member of the team will be in touch to liaise directly with the individual to provide free advice and guidance.

Andrew Stevens, CNet Training's CEO, said, 'With such a huge amount of technical expertise, we wanted to share it, as well as guide those that are considering entering the industry. This is just a little way CNet Training can help give back to those in, or thinking about joining, the industry.'

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# New Occupational Qualification Structure introduced to professionalise the network infrastructure sector

The Electrical Contractors' Association (ECA), Joint Industry Board (JIB), SELECT, CNet Training and a group of employers have developed a new Occupational Qualification Structure leading to Electrotechnical Certification Scheme (ECS) Card recognition.

It sets the benchmark for new entrants but also addresses the need to recognise professionals currently in the workforce that already benefit from hands-on experience, previous education and training, and industry recognised qualifications. This new pathway serves two important purposes – it clarifies the differences in education, training and experience for those already in the industry, and sets out a route for those entering it.

Andrew Eldred, the ECA's director of employment and skills, said, 'We are pleased to have been part of this collaboration with CNet Training and industry employers. It represents a major leap forward towards the goal of an appropriately qualified workforce for the network infrastructure industry and will help ensure that installations will be high quality, safe and deliver improved outcomes for end users.'

Martin Smith, international lead network infrastructure at CNet Training, added, 'We've been working with industry stakeholders for several years to further professionalise the network infrastructure industry. The introduction of the new card structure is a big step forward in ensuring we have a suitably skilled and qualified workforce.'
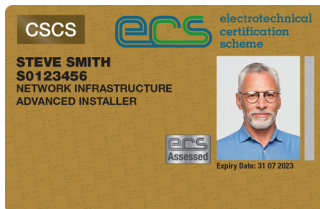
India estimated to reach one billion internet users by 2025

According to estimations calculated by Atlas VPN, India is set to reach one billion internet users by the year 2025. Internet penetration in India reached 50 per cent at the start of 2020, meaning that half of the population in India uses it. This compares to 2015, when only 19 per cent of the Indian population was actively using the internet.

Rachel Welch, COO of Atlas VPN, said, 'The increase in internet users is great news for Indian citizens and businesses, as a widely spread internet will bring many jobs and new business opportunities. The internet user base in India grew by 24 per cent per year on average, from 2015 to 2020. These figures reveal that India's digital environment is developing rapidly.'

Rachel Welch

Aruba claims organisations face hurdles in unlocking the full potential of the edge

The ability of organisations to realise business value from data increasingly depends on their capacity to collect, process, store and analyse it at the edge, according to new research from Aruba, a Hewlett Packard Enterprise company.

According this global study of 2,400 IT decision makers, 72 per cent are already actively using edge technologies to deliver new outcomes, with another 16 per cent planning to do so in the next year. There is also a growing recognition (82 per cent) of the urgency around the need to implement integrated systems to handle data at the edge.

'This research suggests that the vast majority of IT leaders are already embracing the edge or are preparing to,' said Partha Narasimhan, CTO and HPE senior fellow for Aruba, a Hewlett Packard Enterprise company. 'Developing an edge strategy against the backdrop of existing cloud implementations is becoming a necessity as the number of connected devices increases and it becomes impractical to transfer vast volumes of data to a cloud or data centre environment – especially as organisations undergo digital transformation to advance their business objectives and address customer needs.'

BASEC launches cable testing and certification to the data communications market

BASEC has extended its cable testing and certification offering by investing in new service capabilities to support the data communications sector. The service features state-of-the-art testing equipment that is able to assess the performance of a full range of cables including Category 5e, 6, 6A, 7, 7A and 8.

Combining data transmission testing with nearly 50 years of cable testing and certification expertise, end users, manufacturers and re-branders of approved data cables can now benefit from the added value that cable certification offers. This encompasses rigorous process auditing alongside physical cable testing to deliver a holistic cable assessment.

Tony Lioveri, BASEC's CEO, commented, 'BASEC is renowned for being the mark of quality and safety. To be able to leverage this expertise to the data communications market is an exciting proposition, with our service delivered through regional offices and dedicated teams of technical experts. Our goal is to give confidence to end users, manufacturers and re-branders that by using the BASEC mark that they can be assured of guaranteed quality and safety throughout the supply chain.'

Tony Lioveri

Inside_Networks announces date for 2021 Charity Golf Day in aid of Macmillan Cancer Support

Inside_Networks is once again teaming up with CNet Training, Excel Networking Solutions, LMG, Mills, Comtec and ExcelRedstone for the Inside_Networks 2021 Charity Golf Day, which will take place on 26th May at the Hanbury Manor PGA Championship Course in Ware, Hertfordshire.

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

Rob Shepherd, editor of Inside_Networks, commented, 'In 2019 over £13,000 was raised for Macmillan Cancer Support and the event is firmly established as a highlight of the network infrastructure industry calendar. It's a hotly contested but good humoured day, which also offers a chance to catch up with familiar faces and network.'

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

Inside_Networks
2021 CHARITY GOLF DAY 26TH MAY

NEWS IN BRIEF

Nexans has completed the sale Berk-Tek to Leviton for a total purchase price of $202m.

According to The Global mobile Suppliers Association (GSA), a total of 101 mobile operators in 44 countries and territories have now launched one of more fully commercial 3GPP-compliant 5G services.

Stephen Hobson has been appointed as director of business at Datacentreplus.

Equinix has completed the acquisition of 13 data centres in Canada from BCE. The $780m all cash transaction includes more than 600 customers, of which more than 500 are new to Equinix, and approximately 1.2 million gross square feet of data centre space.

UKFast has been confirmed as an approved supplier across all three sections of the UK government's G-Cloud 12.

Belden has become a member of the Information Technology for Public Transport Association (ITxPT).
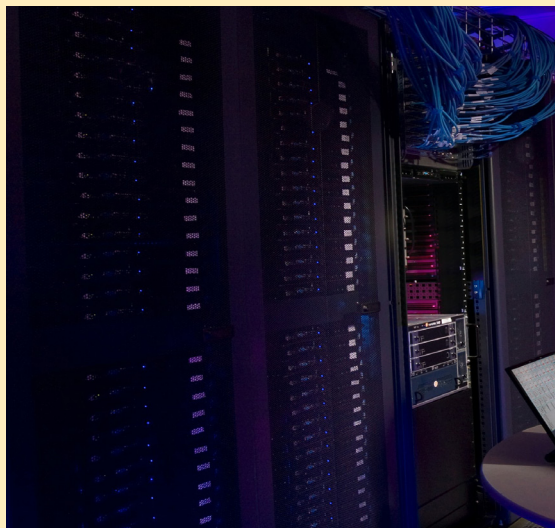
Thinking outside

Hi Rob

In the earliest data centres, a cabinet simply kept IT equipment off the floor. Little consideration was given to factors such as connectivity, power, cooling and how much security was required. However, we now see complex switching fabrics, power levels in excess of 20kW, IT equipment blowing air in several directions and different teams and/or organisations managing equipment within a cabinet. Although today's cabinet designers clearly face a host of challenges, what of tomorrow's data centres?

Will they predominantly house compute, core, distribution or access networking equipment? Will they be part of a top of rack (ToR) or end of row (EoR) architecture? Will they be installed in hyperscale, colocation or edge data centres? These factors influence cabinet design ranging from fundamentals such as footprint to details such as cable management and access control. A cabinet will become a building block – a known quantity of power, connectivity, space, heat and deployment time.

Cabinets will need to be better integrated with what goes on around and inside them, as headroom for inefficiencies diminishes, especially with regards to space. This applies to both the virtual and physical aspects. Outside the cabinet, integration with cooling will be important, as part of a contained aisle system or using in-row or rear door cooling. The cabinet will be a purpose built system component and in most modern data centres we're already seeing this.

Whilst using more vertical space, cabinet design will need to give consideration to raceway systems, which will probably be considered part of the cabinet as opposed to part of the building. Connectivity can be built-in to achieve the most efficient use of limited space. In compute cabinets, connectivity equipment shouldn't require U space and the cabinet should be full of data and power cable management features.

The race for density in multi-fibre push-on (MPO) based optical systems has created products that lend themselves very well to this approach. An additional benefit of integrating the cabinet with the connectivity inside is the reduced need for people to work in the data centre and lower deployment costs.

Cabinets are also likely to be further integrated into data centre infrastructure management (DCIM) systems to enhance features such as capacity planning and

of the **box**

asset management. This will happen virtually but also physically, with built-in sensors enabling automatic DCIM data updates. We're also likely to see greater separation of compute and network equipment. As leaf and spine networks become increasingly common in data centres, the number of incoming connections becomes significantly higher.

At the same time more complex fabrics mean compute equipment often requires multiple Ethernet and Fibre Channel connections to each device. A wide choice of available connectivity types can connect compute equipment to access layer switches. To keep this simple and scalable, separation of compute and network equipment and their respective connectivity, and a well-designed route between the two, can be considered a distinct benefit.

To achieve separation, designers can utilise dead space above the main cabinet body. Space requirements for switching and connectivity in a compute cabinet are unlikely to exceed 6U, with all space above the traditional rack mounting space available for compute equipment. As organisations move critical infrastructure into commercial colocation space, this approach works well for the customer and facility provider, offering greater manageability, faster deployment, optimised efficiency and greater predictability.

Many larger vendors of layer zero products are moving in this direction, with some now making up a bigger slice of the physical infrastructure cake, largely through acquisition. Customers can buy cabinets, raceway, power distribution, cooling and DCIM solutions from the same manufacturer, but to really differentiate their offerings, the race is on to integrate partially disparate components into fully functioning single data centre infrastructure systems.

Oli Barrington
R&M

Editor's comment

Oli has covered a great deal of ground here and there's lots to think about. It's certainly the case that cabinets are becoming less 'passive' and more integrated with the technology and connectivity that they house. Savvy vendors are driving this and it'll be interesting to see how far they are willing, or able, to go.

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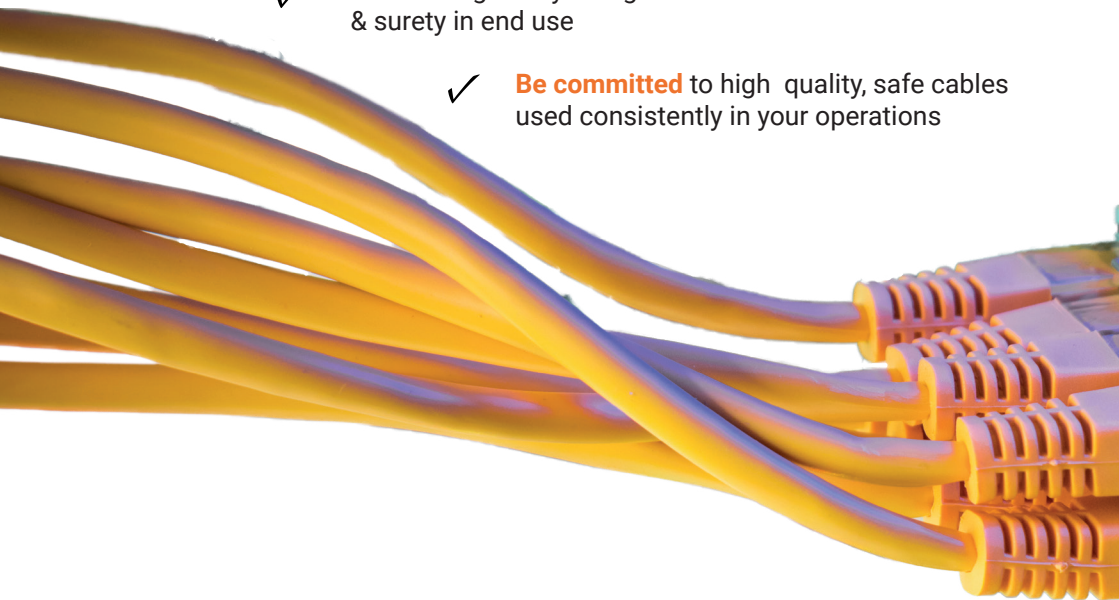
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SCAN ME

Walking on air

Wi-Fi 6 is set to positively impact the design and configuration of intelligent buildings by allowing multiple users and devices to stay connected simultaneously. Inside_Networks has assembled a panel of industry experts to explain how this can be achieved and assess the role network cabling infrastructure plays in maximising Wi-Fi 6's potential

▶ The first of the IEEE 802.11 group of standards was released in 1997 and allowed 2Mb/s of data to be transferred between two devices. Regular upgrades over the years have culminated in Wi-Fi 6 – also known as IEEE 802.11ax.

One of the objectives behind the development of Wi-Fi 6 was to find a way to support multiple high-demand devices at once. Wi-Fi 6 will make the use of technology better and faster, particularly in high-density environments such as intelligent buildings, as well as increasing the performance and reliability of wireless connectivity. In addition, many internet of things (IoT) based applications will rely on Wi-Fi 6 and it is anticipated that it will be a driving force in allowing buildings to develop their IoT infrastructures.

However, a Wi-Fi network must be built on the firm foundations provided by a properly designed, specified and implemented cabling system. Wi-Fi 6 has far reaching implications for cabling infrastructure design, as it requires better cabling pathways and end-to-end solutions capable of supporting access layer switches and uplink connections.

So what effect will Wi-Fi 6 have on the design and configuration of intelligent buildings? To find an answer, Inside_Networks has assembled a panel of experts to examine the issue and outline the key considerations when specifying a network cabling infrastructure to support it.

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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WITH FEATURES TO HELP MITIGATE THE ISSUES INVOLVED WITH OPERATING MULTIPLE DEVICES ON A SINGLE NETWORK, WHAT EFFECT WILL WI-FI 6 HAVE ON THE DESIGN AND CONFIGURATION OF INTELLIGENT BUILDINGS? IN ORDER TO MAXIMISE THE POTENTIAL OF WI-FI 6, WHAT ARE THE KEY CONSIDERATIONS WHEN SPECIFYING A NETWORK CABLING INFRASTRUCTURE TO SUPPORT IT?

LEE FUNNELL
TECHNICAL SERVICES GROUP MANAGER AT SIEMON

Wi-Fi 6 provides distinct advantages over previous generations of Wi-Fi technology. It enables increased speed and capacity with data rates likely to be greater than 5Gb/s and average throughput four times faster than Wi-Fi 5. In addition, Wi-Fi 6 supports a far greater volume of mobile devices and is, therefore, specifically suited for deployment in large public spaces like arenas and airports.

With Wi-Fi performance only as good as the support provided by an underlying cabling infrastructure, network designers and installers must pay close attention to its specification, design and deployment. To fully realise Wi-Fi 6's enhanced capabilities you will need to ensure that two Category 6A or Category 7A drops are delivered to each wireless access point – this will offer up to 10Gb/s performance and support the aggregation of multiple 2.5 Gigabit Ethernet and 5 Gigabit Ethernet links.

It is also advisable to select shielded rather than unshielded cabling to support the remote power requirements of Wi-Fi 6 devices. The enhancements of Wi-Fi 6 wireless access points mean more complex signal processing that, in turn, requires 30W Type 2 power over Ethernet (PoE). Unfortunately, Type 2 PoE can raise the temperature in cable bundles by up to 10°C, which can potentially inhibit the performance of lower specification cabling systems.

Installing shielded Category 6A or Category 7A systems will maintain cabling performance, as these solutions are qualified for mechanical operation up 75°C and can provide greater thermal stability. Also, when cabling is disconnected from a live wireless access point whilst under PoE load, plugs and jacks can suffer from electrical arcing damage. To avoid this, network managers need to consider deploying connecting hardware that complies with IEC 60512-99-001.

One last consideration refers to cabling topology. A grid based zone cabling architecture will ensure sufficient flexibility when managing a Wi-Fi network. Zone enclosures and service concentration points (SCPs) allow for maximum flexibility to interconnect wired cabling uplinks to wireless access points, to quickly reconfigure coverage areas and provide room for upgrades.

> 'TO FULLY REALISE WI-FI 6'S ENHANCED CAPABILITIES YOU WILL NEED TO ENSURE THAT TWO CATEGORY 6A OR CATEGORY 7A DROPS ARE DELIVERED TO EACH WIRELESS ACCESS POINT.'

20

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PATRICK HIRSCHER
EMEA WIRELESS MARKET DEVELOPMENT MANAGER AT ZYXEL

Connectivity is transforming interfaces between the users of smart buildings and systems. Meeting the ever-increasing demands for high-performance, Wi-Fi 6 is leading the way to network transformation. Wi-Fi 6 delivers faster and more consistent connections for every user – even in higher density environments such as smart buildings, which means more users and devices can be connected without any degradation in performance or response time.

Upgrading to Wi-Fi 6 is a necessary and positive step. When compared to past technologies, it has been found that there is up to a 40 per cent speed increase. With improved speed, efficiency and quality inevitably comes reduced maintenance. At face value, this contributes to reduced downtime, heightened confidence in your company's operations and the technologies running them. In addition, Wi-Fi 6 can also be managed remotely by a cloud based access point or networking solution. This provides an easy solution, offering a single point of management and helps to mitigate issues involved with operating multiple devices on a single network.

Moving forward, it's important to build a network strategy that keeps in line with, and ideally ahead of, the curve by incorporating the latest developments in technology. To maximise the potential of Wi-Fi 6, IT teams must take the following key considerations into account when specifying a network cabling infrastructure:

• Choose the right switch for cabling requirements. For example, is 1Gb/s enough or do you need 10Gb/s uplinks in your network environment?
• Decide whether you need a multi-gigabit port switch or not. A multi-gigabit port switch means that the speed can be 1Gb/s, 2.5Gb/s, 5Gb/s or 10Gb/s on the access port. This also depends on the end client that is connected to this port.
• Plan your network environment in a redundant or failover scenario.
• Think about how you will set-up your network. You usually set up a network environment with a core switch, eventually with a server switch and then add an access switch.
• Use different mechanisms to secure your network for unforbidden access by visitors.

Wi-Fi 6 is an investment that provides many networking advantages for businesses, with benefits accruing over a period of time. It's crucial that businesses of all sizes, no matter how small or large, train their workforces to adapt to any change in networking structure.

> 'UPGRADING TO WI-FI 6 IS A NECESSARY AND POSITIVE STEP. WHEN COMPARED TO PAST TECHNOLOGIES, IT HAS BEEN FOUND THAT THERE IS UP TO A 40 PER CENT SPEED INCREASE.'

CHRISTIAN SCHILLAB

MARKETING ENGINEER FOR MEDIA TEST PRODUCTS AT FLUKE NETWORKS

The coronavirus pandemic has changed the way we work. Almost overnight teleconferencing and telepresence became the only option, pushing work to new levels. Many of us had a rough start to this new technology and when video was lagging and audio very poor, the advice from the IT department was often 'don't use Wi-Fi, use wired connections instead'.

Being employed by a company that makes cable testers, I felt a heightened sense of the importance of our work. Is Wi-Fi really a bottleneck? It should be that two people can watch Netflix, play multiplayer video games and/or copy a video from the network attached storage (NAS) to their mobile device.

Wi-Fi 6 is promising to eliminate bottlenecks of latency, throughput, range and add prioritisation of traffic. It's a great step forward, not only for enterprise networks but also for the home. Simultaneous upstream and downstream multiple-input and multiple-output (MIMO) data transmissions allow us to build plug and play mesh networks, which work seamlessly right out of the box.

In the enterprise it offers a great boost and, on top of that, it is scalable. Depending on the expected requirements we must use access points with the adequate number of radios and antennas – 2x2, 4x4 and 8x8 – with the latter coming at a price.

The price for the hardware will erode over time but we will also need to pay a price for the cabling infrastructure. It is advisable to invest in Category 6A cabling rather than hoping that distance and crosstalk in a bundle will allow the usage of multi-gigabit over existing or less expensive Category 5e cabling.

The bigger concern should be power. An 8x8 access point has a much higher power requirement and cable needs to be ready to transmit both power and data on the same pairs. This brings a parameter into the discussion which most of the time is not currently tested – DC resistance unbalance (DCRU) within the pair and between pairs. This parameter is specified in IEEE, EN, ISO and TIA, and ensures the peaceful coexistence between data and power. Consultants are well advised to insist on the test of DCRU not only because of Wi-Fi 6 but also for cameras and intelligent IP lighting.

'CABLE NEEDS TO BE READY TO TRANSMIT BOTH POWER AND DATA ON THE SAME PAIRS. THIS BRINGS A PARAMETER INTO THE DISCUSSION WHICH MOST OF THE TIME IS CURRENTLY NOT TESTED – DC RESISTANCE UNBALANCE (DCRU) WITHIN THE PAIR AND BETWEEN PAIRS.'

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SIMON WILSON

CHIEF TECHNOLOGY OFFICER UK&I AT ARUBA, A HEWLETT PACKARD ENTERPRISE

Arguably the most important new feature of Wi-Fi 6 is the ability to serve multiple devices simultaneously, instead of the existing model where devices compete with one another to send data. This improves overall performance and, in particular, the handling of latency sensitive applications such as voice and video. It also chalks off the two remaining use cases where, in the past, a wired connection may have been more appropriate – namely large file sharing and streaming.

The next big development with Wi-Fi 6 is the improved handling of IoT devices. IoT again benefits from the improved performance of Wi-Fi 6, but we are also seeing Wi-Fi 6 access points with additional IoT specific radios included. Technologies such as Zigbee and BLE 5.0 turn the access point into an IoT hub, which helps expand the deployment of IoT, bringing the worlds of OT and IT closer together.

With greater wireless capacity come additional demands on the supporting wired network. Wi-Fi 6 access points require more power than the previous generation, so if you plan to use PoE then make sure you specify PoE+ (IEEE 802.3at) switches as a minimum. Also, some switches claim PoE+ support on every port, but run out of power budget when lots of ports are in use. Some of the highest spec Wi-Fi 6 access points can require the 60W IEEE 802.3bt standard – switches supporting this standard are more costly.

Wi-Fi 6 is the first generation of Wi-Fi to regularly saturate a Gigabit Ethernet uplink in real world conditions. So, to prevent a bottleneck you either need to bond an additional link or use a higher spec interface.

In the past the next step up from Gigabit Ethernet (1000BASE-T) was 10 Gigabit Ethernet (10GBASE-T). However, the high cost and distance limitations over existing cabling make this a non-starter. The best option is to look at access points and switches that support the multi-gigabit standard IEEE 802.3bz. This new standard covers 2.5GBASE-T and 5GBASE-T in addition to 10GBASE-T – allowing higher speeds over existing cabling. There are multiple scenarios, but the ability to run 2.5 Gigabit Ethernet over 100m or Category 5e cable is the most useful, as it is the most commonly installed cable and should be more than enough for most applications.

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> 'WI-FI 6 ACCESS POINTS REQUIRE MORE POWER THAN THE PREVIOUS GENERATION, SO IF YOU PLAN TO USE POE THEN MAKE SURE YOU SPECIFY POE+ (IEEE 802.3AT) SWITCHES AS A MINIMUM.'

CHRIS FRAZER
PRINCIPAL CONSULTANT AT LAYER ZERO SERVICES

Manufacturers can now create smart devices that connect over Wi-Fi 6 where, previously, they might have been considered unsuitable or uneconomical. There is much interest in the use of battery powered Wi-Fi 6 sensors that can monitor a plethora of environmental factors within a building, but use very little power. The greater the number of smart devices that can be deployed, the greater the range of benefits for occupants.

Future smart buildings will need to be flexible in terms of how people use space. If a greater level of homeworking is part of the way companies will operate, a building that can accommodate more people using it for shorter periods of time will be vital. Where a building once had 500 desks for 500 people, those desks might now be shared between 1,000 people working 2-3 days a week in the office. Wi-Fi 6 can help with flexibly providing connectivity to laptop users, particularly in dense, hot-desk situations.

Wireless access points must be placed to give optimum coverage – therefore, more may be needed in some locations. In existing situations, where many wireless access points are required to allow multiple connected devices, there could even be a reduction in the number needed. However, a grid-based cabling solution will provide the optimum coverage for many devices, both now and in the future.

To provide power for wireless access points over the network using PoE, the larger core diameter of Category 6A over Category 5e helps. Screened cabling will also aid dissipation of heat generated in the cable if using PoE.

There will, for the foreseeable future, be a requirement for optical fibre and copper cabling but how much, where and what must be considered more carefully. Greater thought must be given to what connectivity best suits a client's needs and how to deliver it. Designers must consider themselves connectivity consultants/contractors, regardless of whether that connectivity is over fibre, copper or via the air.

Putting a comprehensive connectivity package together for a client will provide optimum results and Wi-Fi 6 and 5G offer consultants and installers an ideal opportunity to expand their business offerings.

> 'THE GREATER THE NUMBER OF SMART DEVICES THAT CAN BE DEPLOYED, THE GREATER THE RANGE OF BENEFITS FOR OCCUPANTS.'

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PERRY CORRELL
DIRECTOR OF PRODUCT MARKETING AT EXTREME NETWORKS

Unlike previous iterations, Wi-Fi 6 goes beyond just faster data transmission speeds. It offers advanced connectivity capabilities designed to mitigate existing contention issues which are inherent in existing technology with multiple Wi-Fi devices connecting to a single network.

Let's think about today's Wi-Fi like a motorway with cars (devices) all travelling down the road. Existing Wi-Fi technology acts like a single tollbooth where only one device can talk at a time, while all other devices must wait their turn and use quality of service (QoS) techniques to access content. Wi-Fi 6 offers dozens of tollbooths so communication can occur in parallel, not serially. Multiple devices can communicate simultaneously, which is why it is identified as a high efficiency technology.

In theory, if you apply this concept to designing intelligent buildings you would require fewer routers thanks to new Wi-Fi 6 access points being able to support greater numbers of devices and even greater distances. I say in theory because to really take advantage of Wi-Fi 6 technology you need a preponderance of Wi-Fi 6 clients and with over 13 billion non-Wi-Fi 6 devices existing it will be some time before this occurs.

In the meantime, you should leverage access points that support technology steering with Wi-Fi 6 clients being directed to one radio and non-Wi-Fi 6 clients to a different radio – but both can be on the same access point. However, we still need to design networks to support existing technology performance and coverage requirements, so no big changes yet.

Physical cabling for the router network is another concern. Wi-Fi 6 will allow for higher levels of traffic through the access point, so going forward uplink ports will require multi-gigabit ports. As a result, you must plan for your next cable plant upgrades to have at least Category 6 cabling, which is hopefully already in place.

The future will require less access points. Companies adopting Wi-Fi 6 will need to design for today and plan for the future in order to reap the benefits. Wi-Fi 6 performs particularly well in high-density areas, such as a reception, lunch area, open plan office or meeting room, where networks are crowded with a large number of devices.

> 'THE FUTURE WILL REQUIRE LESS ACCESS POINTS. COMPANIES ADOPTING WI-FI 6 WILL NEED TO DESIGN FOR TODAY AND PLAN FOR THE FUTURE IN ORDER TO REAP THE BENEFITS.'

Into the light

Cindy Montstream of Legrand explains how to design smarter with pre-terminated optical fibre

Pre-terminated fibre has become commonplace in data centres and is now expanding into other areas. Most would agree that the benefits outweigh the negatives, however, selecting the right fibre solution isn't as easy as making sure light goes from one end of the link to the other.

STYLE CHALLENGE

Technology advances, new connector styles and business needs are driving the use of pre-terminated fibre. Common in the data centre, it is now becoming a conversation in the enterprise. However, understanding the pros and cons of pre-terminated fibre is important, right down to the component level. With key challenges like insertion loss, latency, scalability, mobility and ease of migration, determining the best solution requires knowledge of each pre-terminated fibre component's impact. Ultimately, more and more design decisions include sacrifice.

The internet of things (IoT), 5G networks, and 4K video are just a few of the technologies that will continue to challenge the computing capabilities of data centres. Data centre architecture is also changing. Traditionally hierarchical, more and more facilities are transitioning to a leaf and spine architecture to reduce latency. With leaf and spine, lower data rates are at the leaf (servers) and higher data rates are in the spine (aggregated switches), driving the need to breakout channels. This is

'Technology advances, new connector styles and business needs are driving the use of pre-terminated fibre. Common in the data centre, it is now becoming a conversation in the enterprise.'

accomplished by using cassettes or by using breakout cables (harnesses), enhancing the popularity of these pre-terminated components.

Connectors are also driving the need for pre-terminated fibre. A multi-fibre push-on (MPO) connector, typically with 12- or 24-fibre positions, cannot be field terminated directly on to an optical fibre cable. There are new, emerging connectors like CS and SN connectors that offer a 40 per cent increase in density over LCs. These connectors will help data centres meet the demanding and ever increasing density challenges, however, they will need to be factory terminated to attain the required performance.

KEY DRIVERS

Project budget typically influences design and pre-terminated fibre helps reduce the overall cost. Labour costs are reduced, since there are no field terminations or specialised skills required, and it requires less time to deploy. Moves, adds and changes (MACs) can be done by in-house staff later, minimising the cost of maintenance. Waste is also minimised by eradicating scraps of cable, reducing packaging and eliminating the use of additional products.

Supporting bandwidth has always been a key design driver, as newer technologies continue to evolve requiring low latency. Lag, slow and failed downloads, as well as buffering video, are a few symptoms of latency problems and lack of throughput. Minimising latency is one of the main reasons the adoption of the leaf and spine architecture is steadily growing.

Pre-terminated fibre provides consistent, known and guaranteed performance – helping to meet throughput and latency needs.

Scalability is also a big challenge for data centres. Pre-terminated fibre simplifies changing components to support higher speeds, making the transition much faster. Mobility is a newer driver that has become even more essential during the coronavirus pandemic. With the need for quick deployment of temporary healthcare facilities, along with supporting other
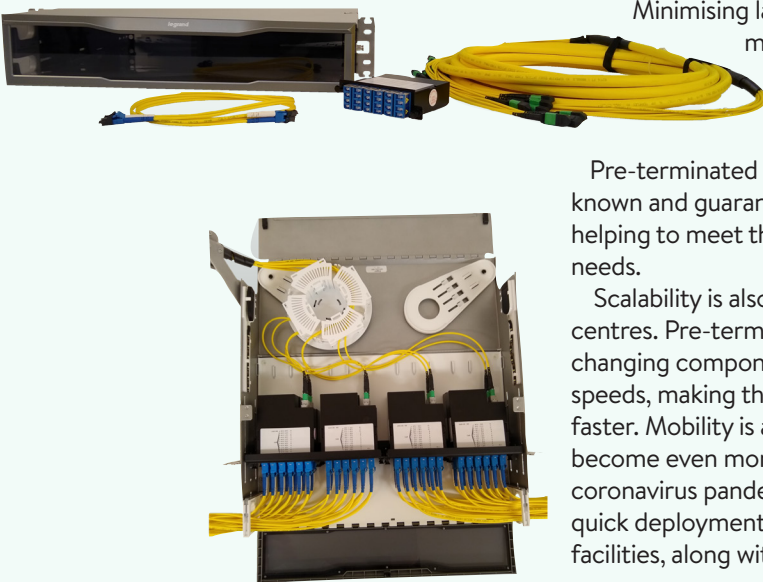
temporary needs, pre-terminated fibre is a perfect solution.

OPTIONS AND CONSIDERATIONS

Common pre-terminated components found in data centres include trunks, harnesses and cassettes. Pre-terminated trunks were initially used most often in the backbone. Meanwhile, harnesses and cassettes have become popular with the need to breakout to LCs or transition from Base-12 to Base-8.

A harness provides the breakout or transition that a cassette does, however, it has lower insertion loss. Pre-planning is required if using a harness, as unlike a cassette, which is a stocked item, a harness is made to order. The overall length, breakout lengths, polarity, fibre type, connectors, etc must be known. Another disadvantage is that if a leg is damaged, the whole harness needs to be replaced, which also causes interruption to the other ports.

Pre-terminated component	Pros	Cons
Cassette	• Breakout to LCs for Base-2 • Transition to 8-fibre MPOs for Base-8 • Easier administration with patch cords • Easier MACs • Ease of design – stocked item	• Higher insertion loss • Replaced with adaptor panel or Base-8 cassette to go to higher speed applications using parallel transmission
Harness	• Breakout option • Lower insertion loss • Lower latency • Better ability to scale	• Administration more difficult • Preplanning needed – length, breakout lengths, polarity, connectors, etc specified when ordering • If one leg is damaged need to replace whole harness
Trunk	• Ease of installation • Performance consistency • Product consistency – repeatability, tight tolerances • Lower installation cost • No connector or cable waste	• Made to order – not stocked items • Preplanning needed – length, polarity, connectors etc specified when ordering • Can't be used if using blown fibre

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Cassettes simplify administration since cords are easier to manage than harness legs, with scaling also easier. To migrate to parallel transmission, a cassette is removed and replaced with an adaptor panel in the same fibre enclosure.

THE SACRIFICE

Loss budget is a very important concern. As applications have increased in speed, total insertion loss for all components has dropped below 2dB. Assuming 3.5dB/km loss for cable and 0.5dB loss

per connection, a channel with two connections and a 100m trunk means the total channel insertion loss is 1.35dB. If a third connection at 0.5dB is added the total channel insertion loss is increased to 1.85dB, which basically depletes the budget for 40 and 100 Gigabit Ethernet.

Having a trunk with a cassette at each end means four connections and it is important to select low loss cassettes. There is an existing product in the market that offers 0.75dB total connection loss in a channel with a trunk, two cassettes (one on each end) and cords. Using products with low loss provides optical headroom to support additional length, more bandwidth or more components.

Sometimes there is a need to sacrifice the benefit of pre-terminated fibre to mitigate design challenges. For example, if the biggest challenge is channel insertion loss, the install cost and time advantage of pre-terminated fibre may need to be sacrificed to use another option. Splice cassettes might be used instead of regular cassettes, reducing the overall insertion loss because now the back connection is a splice with negligible loss. If that is not enough, a trunk with pigtails spliced on to it may be the only way to achieve the channel insertion loss needed. Understanding the main pain point is critical before designing a solution.

RIGHT CHOICE

Technology is evolving quickly and new connector styles like CS, SN and other high-density connectors will drive the use of pre-terminated fibre, since field termination won't achieve the necessary performance. Understanding the options available and the impact they have is the beginning, with density and platforms becoming the key drivers in selecting the right solution. However, first determine your greatest pain point. This may impact the final solution and a good manufacturer partner will understand your requirements before telling you what you need. ■
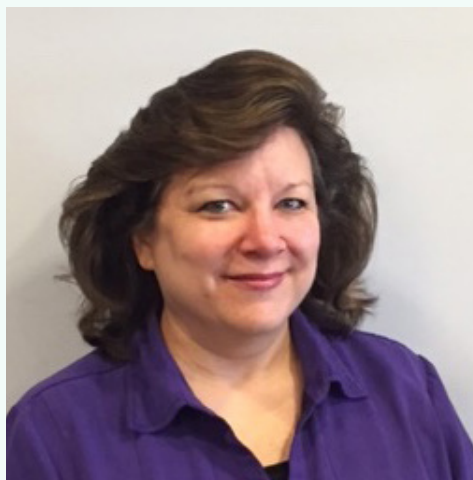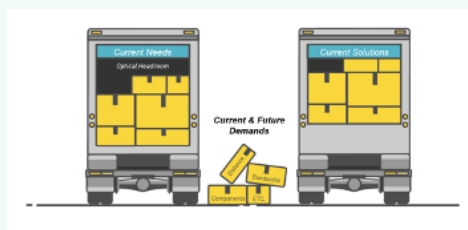
CINDY MONTSTREAM
Cindy Montstream is director of technology support and training at the Data, Power & Control Division of Legrand, North & Central America. Montstream has over 30 years of teaching technical subjects and working in the telecommunications industry. She is a BICSI Registered Communications Distribution Designer (RCDD) and Network Transport Specialist (NTS), and currently participates on the TR-42 subcommittees, holding the chair position on the TR-42.3 committee.

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.

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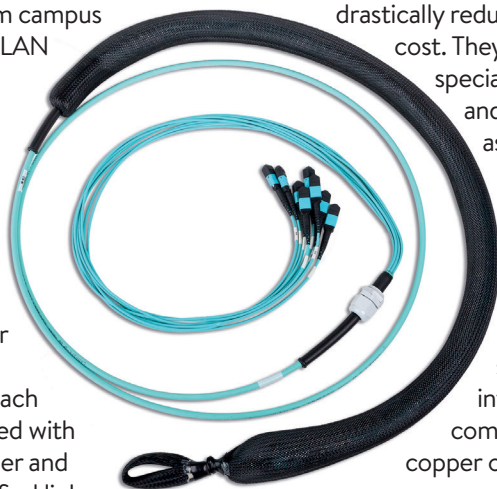
Nexans

Nexans offers a complete range of pre-terminated copper and optical fibre assemblies, which can be installed in any environment from campus and backbone to LAN and data centres. Developed, manufactured and tested to individual customer requirements such as cable length, connector type, fibre grade and fanout size, each assembly is labelled with a traceable number and a customer specified link reference.

Nexans LANmark Pre-Term assemblies enable fast network deployment and drastically reduce installation time and cost. They remove the need for specialised termination training and specific toolkits. All assemblies are delivered with factory test results and are subject to a 25-year LANmark warranty. **CLICK HERE** to find out more about Nexans' pre-terminated fibre solutions and for more information about the company's pre-terminated copper offering **CLICK HERE.**
www.nexans.co.uk/LANsystems

EDP Europe

EDP Europe stocks and distributes the latest high capacity fibre optic management system from Huber+Suhner – IANOS.

IANOS is a class leading and future proofed fibre optic management system that facilitates Base-2, 8, 12 and 24 pre-terminated cable systems for best in class density, speed of installation, handling and scalability – all major factors in future proofing cabling infrastructure.

IANOS is a unique fibre management system that is designed to accommodate a quick, simple and inevitable upgrade path from 10 Gigabit Ethernet serial to 40 and 100 Gigabit Ethernet parallel optics.

IANOS offers individual modules that easily slide out, reducing cord disruption and easing access, with each 1U chassis providing a maximum of 144 LC connections. Single or twin modules help improve flexibility, with twin modules offering improved routing space and splice handling. IANOS chassis are available in 1U or 4U rackmounts.

IANOS is available from stock at EDP Europe.

For more information call 01376 510337, **CLICK HERE** to send an email or to visit the website **CLICK HERE.**
www.edpeurope.com

xSiCute

xSiCute is a service focused UK manufacturer of pre-terminated custom and standard optical fibre cabling solutions. Customers choose xSiCute's fibre patch leads and multi-core pre-terminated products because they are ideal for business critical networks where consistent performance and quality is key.

Whether it is the production of multiple assemblies into a data centre with severe time and access restraints, a multi-site project rollout or the supply of a single pre-terminated solution, xSiCute has the experience to make light work of day-to-day challenges.
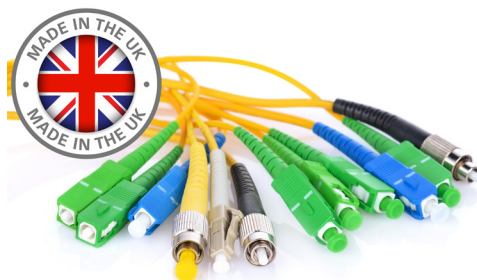
xSiCute custom assemblies include MPO trunks and MPO breakouts, fibre patch leads in ZIP duplex, flat twin, simplex, uniboot and armoured leads. Multicore pre-terms are available in tight buffered, loose tube and CST or SWA armoured, with many variants available in CPR B2ca and Cca.

Products are factory tested, offer up to 75 per cent in time savings when compared to field termination, involve no site storage, and have up to 80 per cent less packaging, with no termination scrap or debris to dispose of.

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

Comtec

Comtec offers a vast range of pre-terminated solutions aimed at the data communications and FTTX markets. Solutions include standard loose tube (with 2mm tails) and tight buffered cable (with 900um tails) in OM1, OM3, OM4 and OS2, as well as armoured CST and SWA constructions made with 2mm tails as standard. Other variants include MPO/MTP trunk and high core count breakout pre-terms.

We use a termination partner along with Draka fibre cable to ensure a high quality but cost effective product that is extremely competitive in the market. We also offer CPR rated Eca and Cca classes (where available) and Cca rated patch leads.
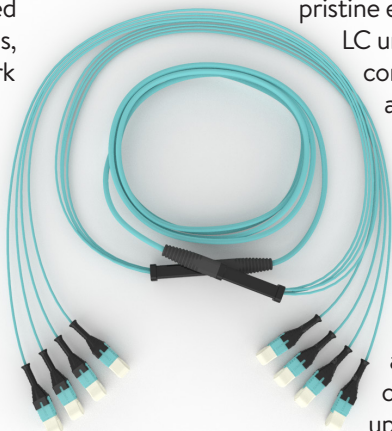
Other branded solutions for FTTX pre-terminated product come in the form of the CasaLink Block Terminal solution from Prysmian, the OptiTap solution from Corning and RapidNet from HellermannTyton.

Speak to our sales and FTTX team on 01480 415000 or view the range online by **CLICKING HERE.**
www.comtecdirect.co.uk

Corning Optical Communications

Optical performance is becoming ever more critical in data centre applications to support uninterrupted downtime for new builds, as well as during network upgrades and changes. Increasing the speed of deployment and clean connectivity are key, and that's why Corning launched CleanAdvantage technology for pre-terminated EDGE and EDGE8 data centre products.

Capable of reducing installation times by as much as 17 per cent, Corning CleanAdvantage technology requires no cleaning or visual inspection before the first install and up to 95 per cent of consumables can be saved. It ensures a pristine end face on MPO/MTP and LC uniboot EDGE and EDGE8 components upon first use, and employs a new dust cap design to keep clean end faces clean for optimum performance.

Corning's pre-terminated MPO/MTP assemblies also feature the MTP PRO connector, enabling quick and easy pin and polarity changes, which now is being upgraded to the MTP PRO Push/Pull for optimal flexibility, ease of use and reduced risk in the field.

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

Excel Networking Solutions

Excel Networking Solutions offers both copper and fibre pre-terminated solutions, which provide end users with a plug and play system that helps to reduce cost, save time and minimise waste.

Having a trusted partner that can deliver expertly inspected, fully traceable and 100 per cent tested systems removes the need to invest in specialist equipment, labour and management costs. Watch Excel's video to find out more.

Excel's pre-terminated copper solutions can be fitted with modules, jacks or plugs on either or both ends of the cable, supplied pre-labelled as single assemblies or loomed. Excel's pre-terminated fibre offering can be supplied in bespoke breakout lengths, with all end faces machine polished and ferrule geometry checked on an interferometer to ensure best performance in all conditions.

For more information **CLICK HERE.**
For further details on pricing and availability please contact the sales team on 0121 3267557 or **CLICK HERE** to send an email.
www.excel-networking.com
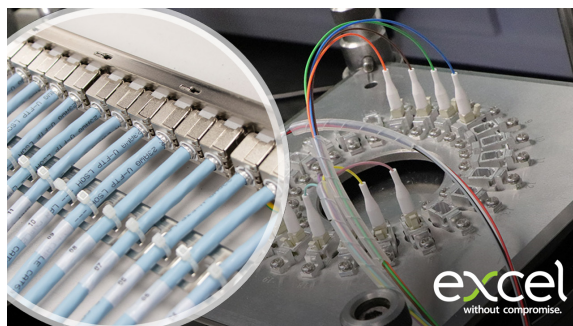
Siemon

Pre-terminated trunking cable assemblies from Siemon provide an easy installation process and a more cost effective alternative to the individual field termination of channels. Siemon's factory pre-terminated cable assemblies simplify the installation of high-performance cabling systems in data centres and other high-density environments, providing future proof solutions that ensure smooth migration to higher speeds as the needs of the data centre evolve.

Siemon's copper trunks are ideal for use in data centre raised floor and ladder rack environments, providing up to 75 per cent faster deployment speed. Siemon's pre-terminated copper solutions range across Category 6A, Category 7A and Category 8.2, supporting application speeds up to 40Gb/s.

Fibre trunks can support all duplex and parallel optics applications up to 400Gb/s and are Siemon factory terminated with a wide variety of interfaces including MTP, MTP Pro, LC and SC, supporting the differing modularity requirements as needed. They can be terminated into fibre enclosures combined with adaptor plates and plug and play modules to facilitate an attractive, easily accessible installation.
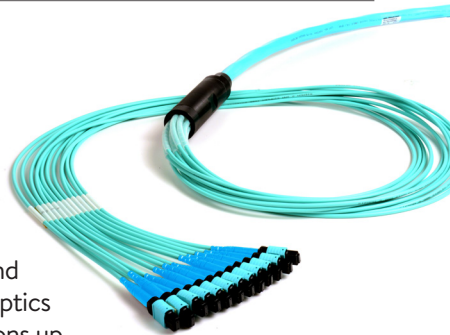
To find out more **CLICK HERE.**
www.siemon.com

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HellermannTyton

RapidNet is HellermannTyton's fully patented pre-terminated, pre-tested modular cabling system, eliminating the need for on-site terminations and reducing installation times significantly. All terminations are housed in the RapidNet cassette, ensuring complete protection and strain relief of the cables.

The RapidNet system offers many advantages over a standard site-terminated solution. It can reduce installation times by up to 95 per cent (fibre) and, because it is pre-tested, minimal on-site testing is required once installed.

The pre-terminated solution delivers high performance across all formats including Category 6A and 6 in copper, as well as OM5, OM4, OM3 and OS2 in fibre. The Category 6A and fibre solutions will support high speed 10 Gigabit Ethernet networks and beyond. High port densities can be achieved using RapidNet fibre, with MTP connectors providing up to 144 fibres per cassette or up to 576 fibres in 1U of rack space.

RapidNet allows a greener approach to cabling infrastructure. With each RapidNet loom manufactured and supplied to pre-specified lengths, there is less on-site cabling and packaging waste. In addition, as RapidNet is manufactured in the UK, the environmental impact of shipping is greatly reduced.

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

Parallel lines

Dave Mullen of Leviton Network Solutions sheds some light on pre-terminated multi-fibre push-on (MPO) cable assemblies

▶ As data centres continue to push for increased bandwidth and reduced latency, demand for faster network speeds and supporting standards have grown dramatically. To handle higher bandwidth, improve network density and prepare for future upgrades, many data centre designers and enterprise network managers are moving to parallel optics with MPOs in their fibre network infrastructures.

COMPETITIVE EDGE

Moving to multi-fibre connector installations may seem complex, with numerous choices and polarity methods to navigate. While field terminated MPO connectors are available on the market, they can be more difficult – and more expensive – to terminate to cable. For these reasons, the large majority of MPO connections are used as part of pre-terminated assemblies. Pre-terminated assemblies are designed for rapid deployment with 100 per cent factory testing and no need for field terminations or splices. As a result, installation time can be reduced by up to 75 per cent.

MPO connectors are array connectors that have more than two fibres, typically available with 8, 12 or 24-fibres for common data centre and LAN applications. Other fibre counts are available such as 32, 48, 60, or 72-fibres but these are typically used for specialty super high-density multi-fibre arrays in large scale optical switches. Their physical characteristics are defined by IEC-61754-7 and TIA-604-5 (also called FOCIS 5).

Unlike single-fibre connectors, which are all male, MPO connectors are either male (with alignment pins) or female (without alignment pins). In order to mate two MPO connectors together through an adaptor,
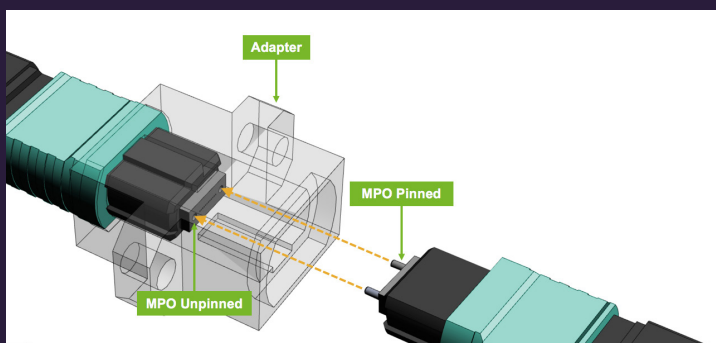
one connector must have pins (male) and the other must be without pins (female). The role of the alignment pins is to ensure that fibres are facing each other perfectly, ensuring successful mating.

MPO connectors are often colour coded to help integrators distinguish between the different fibre types and

polish specifications for singlemode. In singlemode OS2 applications, as per the ISO/IEC and TIA specifications, the cable jacket is yellow. The connector colour will vary depending on the connector type. Ultra physical contact (UPC) connectors are also yellow, while angled physical contact (APC) connectors are green. With multimode OM3 both MPO connectors and cable jackets are aqua, while OM4 is heather violet or also aqua, depending on the region.
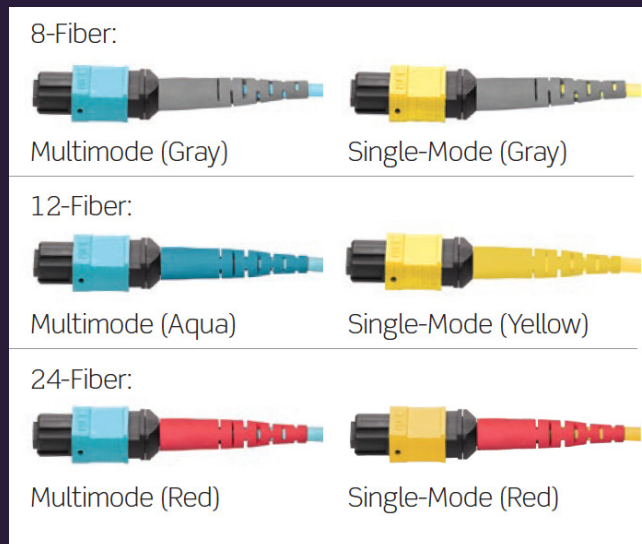
OUT FOR THE COUNT
Deploying MPO assemblies means understanding the fibre count of the connectors you are trying to plug together. Because of the universal mating capability of some MPO connectors, it is possible to connect a 12-fibre MPO to a 24-fibre MPO. Doing so will not result in proper mating and can cause some confusion during moves adds or changes (MACs), or when new network installations are being connected to a legacy installation. Some manufacturers have introduced a colour coded boot to assist in this task. For example, Leviton uses the colour coding in the images below to identify different fibre counts.

There are added levels of complexity to be aware of for some next generation transceivers using MPO assemblies. In some transceiver specifications being developed for 400Gb/s, new MPO connector options such as 16-fibre and 32-fibre are on the horizon. Connector manufacturers are working with design traits like offsetting the key to help avoid inadvertently mating the new options with legacy MPO connectors. To fit the extra four fibres between the alignment pins in the ferrule, the pinholes will also move closer to the edge of the connector. That means the new 16 and 32-fibre MPOs cannot properly mate to existing 8, 12, and 24-fibre connectors.

MIGRATION PLANNING
There are pros and cons to using 24-fibre cabling versus 12-fibre cabling. When it comes to density, 24-fibre cabling has an advantage over 12-fibre since higher density connectivity in the enclosure leaves

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8-Fiber:
Multimode (Gray)   Single-Mode (Gray)

12-Fiber:
Multimode (Aqua)   Single-Mode (Yellow)

24-Fiber:
Multimode (Red)   Single-Mode (Red)

more rack space for active equipment, reducing the total amount of rack space required for patching. With 24-fibre, enclosures can have twice as many connections with the same number of

ports compared to 12-fibre.

Also, the more connectivity that is run in the same footprint, the more crowded it will be in the rack or cabinet, again making 24-fibre cabling more advantageous since only half the number of cables are needed compared to 12-fibre. With this reduced congestion also comes improved airflow and reduced cooling costs.

This is even more apparent in 8-fibre, parallel optic applications. A Base-8 or 8-fibre cabling infrastructure actually uses 12-fibre MPO connectors to achieve 40, 100, 200 or 400Gb/s channels. In these cases, only 8 of the 12-fibres are used, so a third of the connector capacity is dark or unused. This is highly inefficient and adds to the congestion of cable pathways and management solutions. In Base-24 or 24-fibre cabling infrastructure, you get the flexibility to run

'To handle higher bandwidth, improve network density and prepare for future upgrades, many data centre designers and enterprise network managers are moving to parallel optics with MPOs in their fibre network infrastructures.'

24-Fibers (Base24)

12-Fibers (Base12)

8-Fibers (Base8)

three 8-fibre channels in one connector. This provides 100 per cent fibre utilisation in the connector, reduces cable tray congestion and ensures a strong return on an infrastructure investment.

PATH TO ENLIGHTENMENT
When looking for a migration path with fewer connectivity components to be replaced or added when upgrading, a 24-fibre MPO system can simplify migration and reduce costs for both components and installation.

For example, when a 24-fibre backbone trunk cable is installed in a 10GBASE-SR network, that backbone stays in place when upgrading to 40GBASE-SR4 or 100GBASE-SR4 networks. A single 24-fibre MPO terminated cable with an appropriate cassette at each end can support 12x1000BASE-SX or 10GBASE-SR links, or 3x40GBASE-SR4/100GBASE-SR4 links – simplifying network upgrades immensely. When equipment is upgraded, only cassettes and patch

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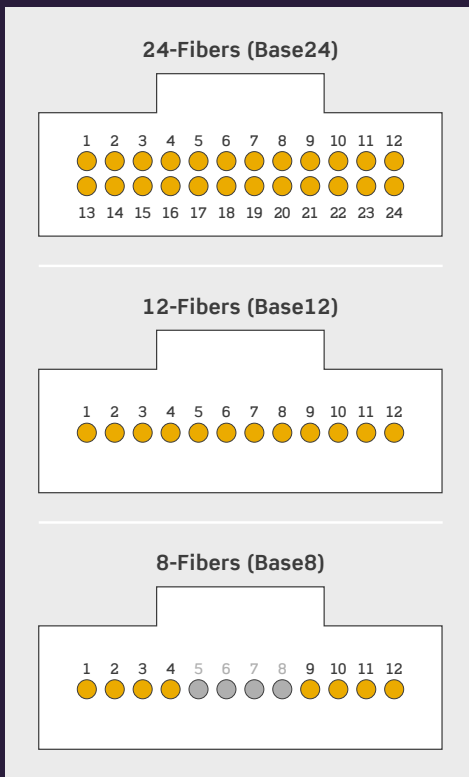
cords are exchanged for the appropriate new MPO components.

The potential downside of 24-fibre is the additional planning required on the front end to ensure proper polarity and routing. However, manufacturers providing a 24-fibre solution will work with network designers and administrators to ensure success. Data centres will need to inevitably upgrade their networks to accommodate 100, 200 and 400Gb/s, and sticking to 12-fibre MPO configurations may actually be more challenging and expensive in the long run, since switch speed upgrades and other network modifications are more difficult.

STRATEGIC DIRECTION

MPO connectors are the most likely method to get to 100, 200 and 400Gb/s in data centres. If managers and integrators do not use MPOs they're going to end up limiting themselves to either long-reach transceiver applications for singlemode, or some type of wave division multiplexing (WDM) technology transceiver if they want to stick with LC connectivity on the fibre trunk. They could also find themselves using long LC patch cords to connect transceiver ports, which do not provide a scalable and flexible structured cabling strategy.

Similarly, getting started on using pre-terminated MPO assemblies now will set enterprise networks up for success, as higher data rates like 100Gb/s become the new norm. Cassettes are easily deployed to break the MPO fibres out to duplex LC pairs while 1Gb/s and 10Gb/s are still in use.

EXPERT HELP

Multi-fibre installations and the MPO assembly options available may seem overwhelming, so it is important to get assistance from experts who understand the evolution of fibre for enterprise and data centre networks. Be sure to reach out to network consultants or your cabling system manufacturer to help with the best possible migration strategy. ■

DAVE MULLEN
Dave Mullen is senior product manager fibre and data centre at Leviton Network Solutions. He has nearly 20 years of experience working in fibre optics and more than 10 years of experience in the electronics sector. He currently sits on two TIA fibre optic committees – TR-42.11 Optical System (568) and TR-42.12 Optical Fibers and Cables.

Why obtain third-party certification on data ca

▶ In a world that relies so heavily on data, poor quality and non-compliant data cables can have a catastrophic impact on the end user. It is crucial that structured cabling systems accommodate data demand both now and in the future. With such a great emphasis on reliable data transmission, both in respect of volume and also transfer rates, network infrastructure quality should be carefully considered.

Performance quality

Data networks have been evolving since 1985 – this is when the first voice grade copper cabling was used to transmit data. Since then, transmission requirements have developed significantly. Increases in data demand have meant a far greater emphasis on cable design to reduce or eliminate the undesirable effects of electromagnetic interference (EMI), making design considerations such as pair geometry, choice of dielectric and shielding critical factors in terms of final performance.

IEC, ANSI/TIA and EN specify the requirements of structured cabling systems in respect to the measurement of data integrity and immunity to EMI. Test parameters have also become more onerous and the key performance indicators for a data cable focus on attenuation and crosstalk. Therefore, in-depth tests have been developed to measure both. These tests determine the interference experienced, which, in turn, impacts the ability of a cable to transmit data without errors.

Made to measure

Approved cable products are assessed to ensure that they are produced using only high-quality components. During the certification process cables are measured against various performance parameters, considering the environmental challenges a cable may encounter during installation and its overall lifespan. This gives the installer and end user peace of mind that the cable being used can accommodate high demands for data, whilst withstanding external influences that could otherwise compromise performance.

Transmission testing alone may not indicate a cable's overall performance. The use of data cables within industrial environments is also increasing and this has resulted in the development of ANSI/TIA standards assessing mechanical, ingress, chemical and electromagnetic (MICE) classification. This determines the harshness of a cable's surroundings and high quality certified cables are essential to minimise product failures.

testing and
bles?

BASEC
BRITISH APPROVALS SERVICE FOR CABLES

Safeguard your network

A manufacturer going through the approvals process is assessed on the basis of many contributing factors – from its quality management systems to how it trains its teams. This minimises the risk of product failures throughout every stage of the manufacturing process.

Samples from each cable design are forensically examined to ensure that all relevant specification parameters are satisfied. Cables form the building blocks of any IT infrastructure and a high-quality product, with proven performance, is critical.

Using a certified manufacturer enables you to be sure of product quality. It is critically important to ensure that structured cabling is tested and verified to meet all complex data transmission parameters. In today's data driven world any instance of system outages or data

corruption can cause businesses a myriad of issues and problems.

Peace of mind

Data communication approval ensures that a level of quality, in line with industry standards, is successfully delivered to the end user. A non-approved cable cannot guarantee this. Third-party certification offers continuous peace of mind, delivered through a rigorous auditing and product sampling schedule, to ensure cables consistently meet the required standards. Data cable certification is essential in making sure structured cabling systems are reliable, efficient and can accommodate forever increasing data demand.

For more information **CLICK HERE** to download your data cables testing and certification guide.
www.basec.org.uk

EkkoSense expands into South American data centre market

Brazil-based InfoStructure has been appointed as the Latin American distributor for EkkoSense's EkkoSoft Critical SaaS 3D visualisation/analytics solution. InfoStructure will be the first organisation to make EkkoSoft Critical available to data centres across the region and will support the EkkoSense solution with a comprehensive service offering including deployment and ongoing optimisation.

The appointment is part of an EkkoSense drive to expand its global partner community. Marco Motooka,

Marco Motooka

executive director at InfoStructure, said, 'Engaging with EkkoSense and offering its EkkoSoft Critical software is a smart move for InfoStructure, as it will enable our customers to optimise the performance of their data centre technology investments. We believe customers in Brazil will also respond well to EkkoSoft Critical's ability to unlock up to 30 per cent savings in their data centre cooling costs, as well as removing the multiple risks that can quickly lead to unplanned outages.'

Will Simmons joins Centiel UK to drive service offering

Centiel UK is continuing to grow its service department with the appointment of Will Simmons as external service sales engineer. Simmons is responsible for continuing the expansion of Centiel's service sales portfolio, focusing on delivering the best solution for the company's customer base.

Louis McGarry, Centiel UK's sales and marketing director, said, 'We provide comprehensive service and maintenance contracts for a wide variety of UPS installations across the UK. Will has lived

Will Simmons

and breathed service for almost 10 years. He is perfectly placed to support our valued customers' service requirements and to help them select the right solution at the right time in a product's lifecycle.'

Simmons added, 'I am excited to join a team of Centiel's calibre. Centiel's UPS technology has a reputation for its high availability and efficiency, which means there really are no limits to providing the very best solutions for our customers.'

Honeywell and Vertiv join forces to improve sustainability for data centre operations across the globe

Honeywell and Vertiv are working together to create integrated solutions to optimise data centre sustainability, resiliency and operational performance. The partnership builds on Honeywell's building management systems (BMS), operational software, and safety and security products, along with Vertiv's uninterruptible power supply (UPS), power distribution, thermal management, infrastructure monitoring and modular solutions, to enable operators of hyperscale, large enterprise, colocation and edge data centres to integrate multiple domains of data.

Rob Johnson

The companies will leverage data to drive optimisation of operations – reducing energy use and costs while improving data centre performance and sustainability. Rob Johnson, CEO at Vertiv, said, 'Business continuity is more critical than ever, with more people working, learning and connecting remotely, driving a simultaneous explosion in data and demand for new data centres. There is need and opportunity for data centres to be more efficient, reliable and sustainable. Our collaboration with Honeywell will help us to collectively better serve our customers, as our offerings complement each other to provide greater value.'

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CHANNEL UPDATE IN BRIEF

The Panduit ONE Partner Program will continue waiving its registration fees for select online and virtual network infrastructure courses until 31st December 2020.

EfficientIP has appointed Kieran Wood as its new country manager and sales director for the UK and northern Europe.

Huber+Suhner has reinforced its commitment to developing products dedicated to the mission critical applications of the professional and secure communication market by joining the 450 MHz Alliance.

Boston Networks, Pinacl and Pinacl GDA, 2020 Vision Systems and PEL Services have united to rebrand as North. The five companies have been brought together to build a modern and progressive network infrastructure, internet of things (IoT) and safety and security business, delivering innovative and specialist services.

Juniper Systems has announced the expansion of its sales team in Europe, the Middle East, Africa and India, with Manjit Dosanjh joining the team as channel sales manager.

Specialist Project Integration (SPI) has joined the Smartsheet Aligned Partner Program as a Platinum Partner.

Quickclicks

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

Flash forward - Life in 2030 is a white paper from **Nokia** that looks at how 5G will transform our lives over the next decade. **CLICK HERE** to read it.

Harting has organised a new series of its Experts Camp webinars to discuss the latest in industry innovations and connection technology. **CLICK HERE** to find out more.

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

Axis Communications' latest whitepaper – The Digitization and Cybersecurity of Physical Access Control – presents a new vision of how such systems should be deployed and utilised in the internet of things (IoT) era. **CLICK HERE** to download a copy.

In his latest blog Didier Willems of **Nexans** looks at some of the main standardisation bodies and the cabling standards they have published. **CLICK HERE** to read it.

MPO Connector Basics and Best Practices is a white paper from **Leviton.** **CLICK HERE** to download a copy.

Protect Your Network from Physical Security Breaches is a blog from **Siemon.** **CLICK HERE** to read it.

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Pandemic-Proof Data Centers Offer Hope for the Future is a blog from Andrew Donoghue of **Vertiv.** **CLICK HERE** to read it.

Delivering the goods

Companies must protect critical infrastructure from power disruptions and Valerio Zerillo of Vertiv explains why uninterruptible power supply (UPS) technology offers the best chance of achieving stability

▶ The surge to remote working en masse has forced companies to stop talking about digital transformation and start delivering it. In an age of pandemics, remote offices and ongoing uncertainties, our reliance on data and IT infrastructure to keep businesses running as usual is at its most critical. With workforces distributed across cities, regions and countries, business leaders need to ensure that employees still have access to the apps and data they need to do their jobs. This means ensuring that central and edge data centres are robust and reliable so that access to resources is not interrupted.

MAKING THE RIGHT CHOICE
A UPS provides clean back-up power to IT and critical infrastructure. In case of outages these systems offer a few minutes of power to safely shutdown workstations and allow back-up generators to kick in, or provide up to several hours of power for certain types of equipment. Ultimately, a UPS can mean the difference between business as usual or the loss of data and hours of productivity. In fact, with downtime costing some industries more than $301,000 per hour, and in some cases a staggering $1m per hour according to Statista, the investment in a UPS is a small price to pay for a guaranteed power lifeline.

But how do you know what kind of UPS is right for your business? Choosing a UPS that is the best fit requires you to know how much power your IT and critical infrastructure needs, and your tolerance for downtime for each application. To select a UPS for a particular application, you need to examine a number of factors. Core criteria include load size, location, criticality of the equipment to
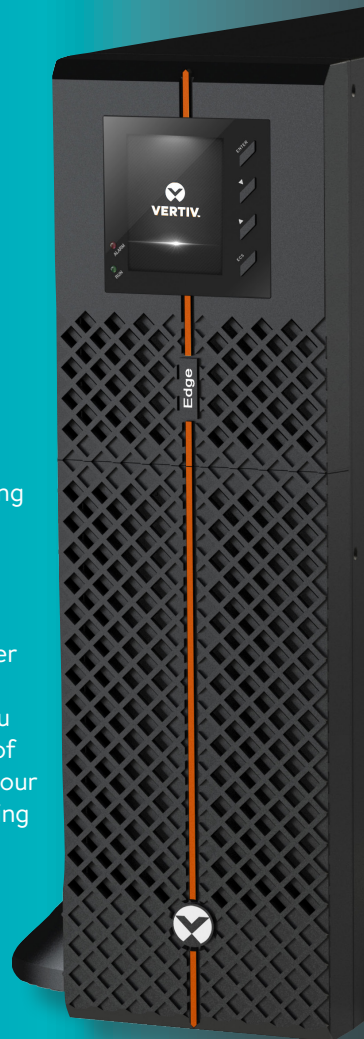
be protected and, of course, budget. Two major types of UPS operating modes are online double conversion and line-interactive. Whilst both types are commonly used, there are a few distinctions to be made which will help identify which kind of UPS is right for your business.

ONLINE UPS

Online UPSs deliver a better quality of power than other technologies. This is because power runs through an online UPS continually, with no break when transferring to battery. Therefore, this type of UPS protects the critical load from almost all power disturbances including blackouts, brownouts, sags, surges and noise interference. In comparison to a line-interactive UPS, an online UPS provides 100 per cent power conditioning, zero transfer time to battery, no change in output voltage and better transient suppression. It is therefore no surprise that an online UPS is the most common choice for protecting large data

'Those that recognise the importance of protecting a business infrastructure through the right UPS system will not just create a seamless working environment, but will be ready for whatever challenges lie ahead.'

centres, as it guarantees the highest level of power quality.

LINE-INTERACTIVE UPS

Line-interactive UPSs are most effective in areas where outages are rare but power fluctuations are common. They support a range of input voltage fluctuations before switching to battery back-up. The critical advantage of a line-interactive UPS is that it accepts a wide range of input voltages and therefore provides total protection.

While a line-interactive UPS is more cost effective than an online UPS, it is worth noting that there is typically a four to six millisecond break in power when transferring to battery back-up. However, on the plus side, the UPS balances under and over voltages. This technology provides a good choice between reasonable protection and moderate operating costs.

It should also be noted that line-interactive UPS systems rely on the battery to condition power, so will drain a battery more frequently than online UPS systems.

DIFFERENT STROKES

The biggest differentiators between online and line-interactive UPSs are the input voltage and the level of protection. Online UPSs operate on voltage and frequent independent (VFI) mode. This means the

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needs UPS protection and assess which IT or electronic devices warrant it. For each device to be connected to the UPS, determine the power consumption (watts) of that device. Power consumption can typically be obtained from the equipment nameplate or manufacturer documentation. The required UPS capacity is the sum of the power consumption of the devices to be connected to it.

• Assess the required UPS runtime for critical devices and applications. How long are you likely to need a UPS to operate in case of a power failure? Understanding this metric will help you identify the best solution.

output voltage does not depend on the input voltage for the same frequency.

Line-interactive UPSs operate on voltage independent (VI) mode. The output voltage does not depend on the input voltage but the output frequency depends on the input frequency.

What does this mean? An online UPS has lower efficiency than other models but is able to smooth voltage and frequency imbalances, so it is the most secure mode of operation for the load. Line-interactive UPSs operate more efficiently but the UPS is only able to smooth voltage imbalances.

FOUR TO THE FLOOR
To ensure you make the right UPS choice, it is important to consider four aspects:

• Determine the size of the load that

• Determine the number of outlets required. Add up the number of devices that you need the UPS to support and make sure the UPS has enough outlets to meet your immediate needs, while leaving some room for growth. Alternatively, use a power distribution unit (PDU) to provide additional outlets, but be careful not to overload the UPS.

• Consider UPS installation requirements. UPSs come in a variety of sizes and form factors. Tower models, for example, are standalone units that sit on the floor, desk or shelf, and often back-up desktop computers, servers and routers in an office environment.

TIME TO UPGRADE?
Owners of older UPSs must also reassess

and upgrade their systems to keep their critical loads efficiently and reliably protected. To determine if you are due for an upgrade, consider the following questions:

• Is your UPS system more than 12 years old?

• Is the operating efficiency of an older system causing your utility bills to be a drag on your budget?

• Are critical parts becoming less available?

• Is servicing your system becoming more difficult?

• Is the current utilisation rate of your system too low or too high?

• Are the batteries, capacitors or fans due for replacement?

With many older UPS systems operating at less than 90 per cent efficiency, operational savings alone are enough to consider a UPS upgrade. This is even before looking at other benefits such as access to a reliable supply of parts, lower service requirements and likely footprint savings. Remember, UPS upgrades require planning and installing. Therefore, it is critical to partner with proven technical professionals trained to help in proper selection, transition and deployment.

MEETING CHALLENGES
UPS systems are critical to business continuity. Those that recognise the importance of protecting a business infrastructure through the right UPS system will not just create a seamless working environment, but will be ready for whatever challenges lie ahead. ∎

VALERIO ZERILLO
Valerio Zerillo joined Emerson Network Power, now Vertiv, in 2014 as product marketing engineer for AC power in EMEA. In 2015 he was appointed product manager and since 2018 he serves as global offering manager for large power systems. Zerillo holds a master degree in electronics engineering, electronic systems for information processing from the University of Bologna.

Sunbird Software

Easily and accurately track hard drives, power supplies, line cards, memory modules, patch cables or any other subcomponent in your data centres and edge sites with Sunbird's data centre infrastructure management (DCIM) software.

Now available in dcTrack 7.2 is a parts management feature that enables users to manage high-value inventory items, monitor the supply of spare parts and be alerted when they run below user configurable thresholds. Planning and provisioning new equipment or break/fix work can now be accomplished in a single tool with complete knowledge of the required bill of materials, spares or components. The feature includes a parts library, custom fields to track any parts attribute and an audit log of all parts transactions.

Additional new features include an improved connectors library to define the connectors you use and their compatibility, enhanced ServiceNow CMDB field matching and data integration, as well as the ability to implement data centre moves via drag and drop and much more.

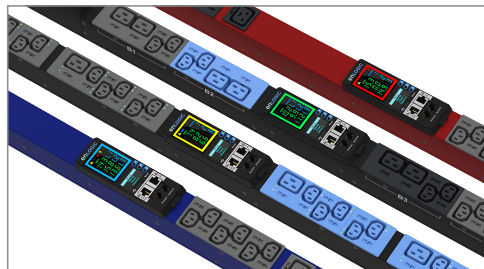**CLICK HERE** to schedule a demo. **www.sunbirddcim.com**

Enlogic

Enlogic introduces the new Advantage Series of intelligent power distribution units (iPDUs). Our most advanced iPDU brings the security and reliability users have come to expect from Enlogic products, with innovative features to enhance data centre management.

Enlogic PDUs are packed with user friendly management features including high accuracy metering, DC power sharing, IP cascading up to 64 PDUs (dual direction), environmental sensors and electronic security handles. The hot-swappable, toolless network management card (NMC) installation ensures power is always on for every critical data centre operation if you need to change or update the NMC. Furthermore, the patented user selectable colour coded LED display can be quickly and easily configured to differentiate power sources.

Quality built and engineered to last, Enlogic offers the industry's best five year warranty on all Advantage Series iPDUs. From the design, components and precision manufacturing – Enlogic has produced an iPDU with the highest quality from start to finish.

CLICK HERE for more details or to email the sales team **CLICK HERE. enlogic.com**

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Austin Hughes

Save valuable rack space with Austin Hughes' InfraPower Intelligent Dual Feed Power Distribution Units (PDUs). The primary and redundant (A&B) power feeds are within the same PDU, helping save rack space by utilising one PDU rather than needing two separate PDUs per rack. Cable routing for both primary and redundant power connection can be organised to one side of the rack if preferred.
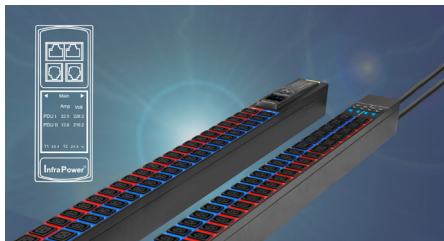
InfraPower Intelligent Dual Feed PDUs also minimise network IP requirements – only one IP for 32xPDU primary and redundant access – and have advanced features including field replaceable 2.8-inch colour LCD touchscreen displays, data centre power modules, latching relays and ports for PDU daisy chaining, as well as external sensor/peripherals.

InfraPower Intelligent Dual Feed PDUs are supplied with free management software (IPM-04) or can be integrated to third-party data centre infrastructure (DCIM) via SNMP. Custom configurations including multiple socket types per PDU and colours to match data centre power chain are available on short lead times.

To find out more **CLICK HERE.**
www.austin-hughes.com/emea

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Centiel

Centiel's class leading modular UPS, CumulusPower, offers a completely flexible solution for critical power installations. With a range of frame and module options, CumulusPower is available from 10kW-3.6MW.

For larger installations, CumulusPower also offers either top or bottom cabling connection. This innovative design means the UPS can be connected from an either high or low level, without the requirement for a separate cable entry enclosure, enabling a more flexible layout within comms rooms and data centres, maximising the use of space.

CumulusPower is known for its 99.9999999 per cent (nine nines) system availability. This is achieved through fully independent and self-isolating intelligent UPS modules, unique Intelligent Module Technology (IMT) and a fault tolerant parallel Distributed Active Redundant Architecture (DARA), which removes single points of failure and reduce total cost of ownership through high double conversion efficiency of >97.1 per cent. This means it is currently the best and now the most flexible solution available for power protection.

CLICK HERE for more details.
www.centiel.co.uk

Chatsworth Products (CPI)

The interconnected world and the global change toward remote activities is placing new demands on power management in data centres, and with rack densities rising globally, equipment monitoring at the rack level has never been so critical. CPI's eConnect PDUs provide data centre managers with all the information they need to make informed decisions when it comes to capacity planning, rapid deployment, reduced networking costs and regulatory compliance.

Adhering to growing safety standards and compliance requirements such as UL 62368, a new 2020 requirement for Europe and the United States, CPI's next generation eConnect PDUs include greater outlet density, as well as an industry first Redundancy Pack, which includes two PDUs, one in black and one in glacier white, for easy identification of the primary and secondary unit.

eConnect's other market leading features include Secure Array IP Consolidation Technology, a 65°C (149°F) temperature rating, and software integration with environmental monitoring and RFID electronic lock kits.

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

Comtec

Comtec offers a comprehensive range of power management solutions that reduce downtime and energy costs, while improving energy efficiency. The range includes uninterruptible power supplies (UPS), automatic transfer switches (ATS), surge protection devices and basic, metered and intelligent rack PDUs from leading brands such as APC, Austin Hughes, Eaton and Ultima.

For IT rackmount devices without power redundancy, the Austin Hughes InfraPower rackmount ATS with dual power inputs provides reliable and redundant power for single corded equipment, with one ATS effectively providing power redundancy to multiple pieces of critical equipment. Looking to save valuable rack space? The dual feed rack PDU houses two PDUs in a single chassis, with a coloured PDU layout to distinguish between primary and redundant (A&B) power feeds.

To discuss these and other power management solutions call the Comtec team on 01480 415000, or **CLICK HERE** view the range online.
www.comtecdirect.co.uk

Fit for purpose

Richard Gray of Austin Hughes explains why, when it comes to rack power management, one size doesn't fit all

▶ Rack power management has evolved in recent years and the options available today enable better usability, energy efficiency and capacity planning. However, there is a common misconception that all power distribution units (PDUs) are created equal in terms of their levels of technology, functionality and features.

USER FRIENDLY

There are often varying power specifications depending on the usage requirements within the different areas of a network. Power should be scaled, from the distribution board to rack level, to provide the most power efficient solution for the end user. In many cases this can provide a cost reduction and better return on investment in relation to the quantity of feeds to the distribution board.

Rack mounted hardware, application and incoming power all have a bearing on intelligent rack mounted PDU technology levels whether monitored, metered and outlet switched, or outlet switched with outlet metering. Although the higher the level of technology the greater the cost per unit, it is worth looking at expansion and planning in order to ensure that any solution meets the future demands of a business.

Given its mission critical nature, an intelligent rack PDU should be designed, built and manufactured to provide extremely high levels of resilience. Areas that can be used to benchmark this are hot swappable digital local touchscreen displays and hot swappable DC power modules that are typically used within metered and outlet switched variants, and outlet switched with outlet metering PDU models. It is also advisable to make sure certain latchable relays are included at the socket or receptacle level.

EACH TO THEIR OWN

Multi-tenant colocation data centres often have an array of clients that also operate their own on-premise enterprise data centres. However, power requirements can differ between the two, requiring PDU solutions to suit each type of facility. For example, colocation facilities may have higher density, higher power 63A requirements – something that is less likely in a lower

density landlord environment or in an end user's own data centre that needs a 16A or 32A solution.

The utilisation of intelligent PDUs means power usage data such as current (amp), voltage (volt), power (kW), energy consumption (KWh) and power factor of the entire PDU is available. This data can be collated and reported using a web-based graphical user interface (GUI) or integrated into an existing building management system (BMS) or third-party data centre infrastructure management (DCIM) platform.

This data is remotely accessible by engineers with appropriate administration rights, and negates the need to attend site. PDU data can be used for interdepartmental billing where relevant for enterprises, or as a revenue stream for multi-tenant colocation data centres to provide accurate billing data to clients. The necessary data and interdepartmental requirements also need to be taken into consideration to ensure a power

management solution is fit for purpose.

NEW NORMAL

The digital transformation of organisations, the increase in remote working due to the coronavirus pandemic and our reliance on online services including financial platforms, streaming entertainment services, social media and communication applications have increased the amount of data we are generating. According to We Are Social's Digital 2020 report, internet users are spending an average of six hours and 43 minutes online each day, meaning that the typical user now spends more than 40 per cent of their waking life using the internet.

Average rack power density has risen from under 5kW per rack to up to 20kW per rack due to advancements in areas such as high-performance computing (HPC), where evolving technologies like the internet of things (IoT), artificial intelligence (AI) and 5G generate vast quantities of data. As a result, server racks require up to four

> 'Average rack power density has risen from under 5kW per rack to up to 20kW per rack due to advancements in areas such as HPC, where evolving technologies like the IoT, AI and 5G generate vast quantities of data.'

PDUs to be mounted. The most common solution is to install a minimum of two PDUs in each rack to allow the continuation of both primary and redundant (A&B) power feeds. This reduces the chance of unplanned power outages at the rack equipment level by adding in resilience.

THINKING CLEARLY

Organisations should consider different coloured PDU chassis to allow clear visual identification for technicians and engineers, therefore reducing the chance of human error whilst

work is undertaken in racks and cabinets. The colours should follow the power chain throughout the data centre estate.

Alternatively, to save valuable rack space, dual feed PDUs can be installed, where the

primary and redundant feeds are in one PDU and provide an overall cost saving to the end user. These can still have colours applied to differentiate the primary and redundant feeds.

Global organisations, whether taking space in colocation facilities or utilising their own IT estates, need to consider local variations such as voltage, input and socket types for each geographic location. The same rack PDU will not be suitable in each location or for every application within an organisation. PDU features should be carefully considered to provide the best performance in each scenario.

SUPPORTING ROLE

The benefits of intelligent rack PDUs are not limited to traditional IT and data centre installations – cities and buildings have evolved to become smarter, with intelligent infrastructure playing a vital role. Within new office and mixed use buildings, intelligent power strips can be found supporting professional audiovisual equipment, CCTV, access control, network infrastructure and lift controls.

As such installations encompass high value equipment, it is worth considering PDUs featuring individual socket fusing to provide an additional level of protection. Socket switching functionality also enables equipment to be bought back online gradually and without overloading systems. Where cord retention is critical, the addition of secure cords with the PDU installation is recommended.

COOLING CONSIDERATIONS

Rack PDUs should be designed and built to operate at temperatures of up to 60°C in order to withstand the temperatures reached within racks and aisle containment solutions. However, with PDU model sizes increasing to accommodate the growing amount of hardware housed in racks and the increase in power density generating further heat, environmental management options should also be considered. Integrating environmental sensors with the intelligent PDUs allows parameters to be set to monitor temperature/humidity fluctuations. Furthermore, setting alarms and thresholds provides early detection of issues within the rack and can also include smoke and water sensors, all of which can be monitored and managed remotely. ■

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RICHARD GRAY
Richard Gray is sales director EMEA at Austin Hughes and has over 20 years' experience in the IT and data centre industry. With extensive knowledge of data centre infrastructure including power, security and environmental management, Gray works closely with data centre end users to manage their power capacity, reduce downtime and energy costs, and improve energy efficiency.

Extreme Networks delivers cloud powered connectivity for students and staff at Harrogate Grammar School

Extreme Networks has deployed ExtremeCloud IQ at Harrogate Grammar School to support its 1:1 education approach.

To help Harrogate Grammar School realise its connected classroom aspirations, NETprotocol and Extreme Networks joined forces to deploy ExtremeWireless high-density Wi-Fi 6 access points and ExtremeCloud IQ. This offers an end-to-end network management and operations solution.

Access points were also added into classrooms to offer reliable connectivity for the devices in each room and to enhance coverage and minimise cross channel interference with other rooms. The scalability, security and simplicity offered by this solution has further helped future proof the school's infrastructure to power a new connected and interactive learning experience for students and staff.

Nutanix Enterprise Cloud solution chosen by FBD Insurance to replace its data centre architecture

Nutanix's Enterprise Cloud solution has been chosen by FBD Insurance to replace its data centre architecture, as a key first step towards digital transformation.

Selected following exhaustive competitive testing, the Nutanix cloud software was chosen primarily because of its ability to match the agility, on-demand scalability and easy manageability of public cloud services, while also addressing concerns of key stakeholders reluctant to see business critical applications move out of the data centre.

Although business and technology stakeholders were signed up to a wider cloud and digital first strategy, many were concerned that moving core systems to the public cloud might lead to performance, security and compliance issues. Once they saw for themselves that the Nutanix cloud software could deliver the same business, technical and economic benefits from within the existing data centre set-up, that reluctance largely evaporated.

Virtualisation was another key differentiator – the Nutanix software winning out against the competition thanks to its AHV hypervisor available without additional charge as an integrated component of the Nutanix software stack.

Secure IT Environments builds new data centre through lockdown for Opus Trust Communications

Secure IT Environments has completed a new data centre for Opus Trust Communications in Leicestershire. The new modular data centre, which further increases the security rating of Opus Trust's operations, began construction in April 2020, during the UK's coronavirus pandemic lockdown.

The nature of Opus Trust's operations gave the project key worker status, and despite the many challenges created in the supply chain, logistics and on-site management of the project, it was fully delivered in just 15 weeks. The new data centre was built in a fully operational area, which meant particular care had to be taken to develop new processes and timelines to ensure the project minimised risks for all involved.

Secure IT Environments designed and built the new modular data centre, which includes 19-inch cabinets, a new UPS located in a separate UPS secure compound, LED and emergency lighting, and in-row air conditioning units in N+1 configuration. The company also installed a dual power supply infrastructure, switchgear, structured cabling, raised access floor and environmental management systems.

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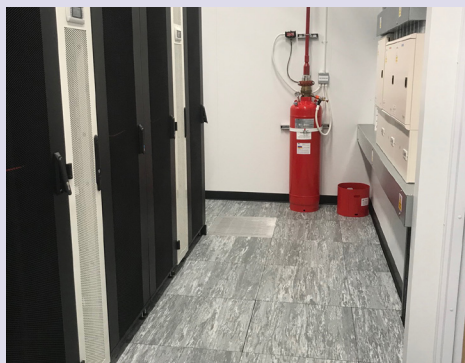
PROJECTS & CONTRACTS IN BRIEF

IP House has launched IP Cloud Connect, a new collaborative cloud solution with partners IP Office, CXS and Cloud Systems.

Aruba is celebrating the third year of its Global Cloud Data Center. To mark the anniversary of the campus, the company has formalised extensive expansion work that involves the entire area and will lead to the imminent activation of two new data centres called DC-B and DC-C.

CityFibre has appointed Bechtel to support a major acceleration in its full fibre rollout, as it awards up to £1.5bn in construction contracts in the coming months and commences mobilisation across an additional 29 towns and cities.

Epsilon has partnered with Business Connexion (BCX) to deliver high-performance data centre interconnection services for African enterprises.

Nokia has been selected by Elisa as its nationwide supplier of 5G RAN.

Juniper Networks has been chosen by Telefónica Spain to secure the mobile backhaul of its growing 5G network.

Leviton

Leviton's Cat 6A High-Flex Patch Cords give network managers additional flexibility and improved bend radius at wireless access points and remote smart building devices, while supporting higher data rates up to 10Gb/s. The short plug and high-flex boot reduce the amount of space required in applications with limited depth behind wireless access points, backboxes and furniture plates.

The small diameter cords also help data centre technicians with installation and maintenance in high-density patching environments, while the design and metal wrap on the patch cord plug also enables the cords to have outstanding electrical performance in both shielded and unshielded twisted pair applications.

CLICK HERE to learn more.
www.levitonemea.com
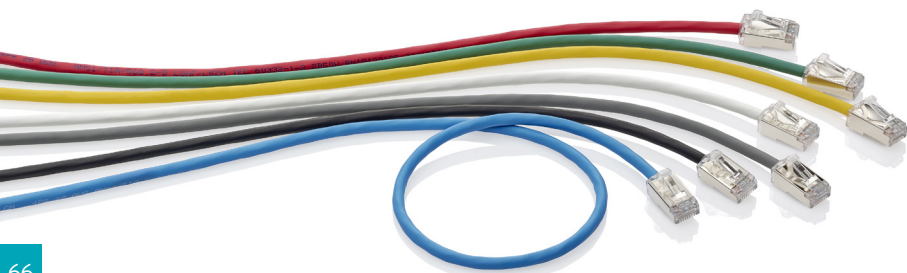
66

Ideal Networks

It has been a challenging year for many businesses, which have worked hard to keep critical networks up and running but may feel uncertain about future cashflow. In response Ideal Networks has launched a new Networks Reward promotion that gives cable installers, network technicians and systems integrators free products up to the value of £1,800 with an eligible purchase.

With the new promotion, which runs until 31st January 2021, those purchasing a LanTEK IV 3000MHz cable certifier will be eligible to receive up to £1,800 of Ideal Networks products of their choice at no extra cost. Those opting for a LanTEK IV 500MHz

certifier model will receive up to £1,500 of free products.

There are also rewards for those investing in SignalTEK NT transmission testers, who will receive a free PoE Pro worth £415, and those buying a SecuriTEST IP CCTV tester, who are eligible to claim a free VDV II Plus cable verifier worth £231.

Those making a purchase have 90 days to claim their free reward via a simple online claim form. Proof of purchase is required, and terms and conditions apply.

CLICK HERE to find out more.
www.idealnetworks.net

ShanCo IT Services

ShanCo IT Services is a professional services company specialising in:
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shancoitservices.com

R&M

R&M has opened a UK customer demonstration lab, which is located in Reading – 30 minutes from central London and Heathrow, and in the heart of the M4 corridor. The lab is equipped with:
• High density optical solutions to optimise leaf spine network rollouts
• Ribbon fibre connectivity for hyperscale data centres
• ODF solutions for meet me rooms and FTTX applications
• Copper connectivity products including Category 6A, Category 8, DAC and AOC solutions
• Broadband rollout solutions, burial closures, street cabinets and building entry devices
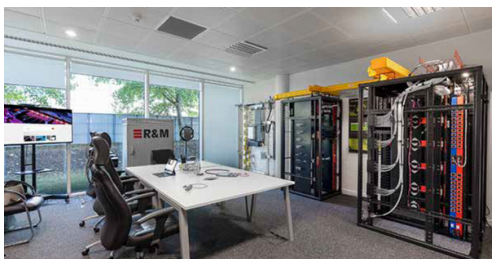
• Preconfigured cabinets
• Cable management and raceway solutions
• Passive optical LAN
• Infrastructure management software and hardware solutions

R&M's solutions deliver value through innovation and have features designed to support resilience, agility, reduced total cost of ownership and future proofing. With the support of technical staff the lab is available for R&M's customers and partners to aid solution design, testing, POC, engineer and sales training, or just to get new ideas.
   To find out more or schedule a visit contact Oli Barrington on 07803 875339 or **CLICK HERE** to send him an email.
rdm.com

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MEDIA KIT 21

Career opportunities

CNet Training's Michael Gardner discusses the digital infrastructure industry skills shortage and how, without collectively resolving the issue, the sector will struggle to grow and keep up with the continual increase in demand

▶ Professionals within the digital infrastructure industry have been talking for years about how to inspire a new generation to consider a career in the data centre and network infrastructure sectors. Yet most people still don't know what a data centre is, what the cloud is, or where their photos, videos and other personal data is stored. However, as soon as the internet goes down, they start paying attention and instantly want answers! We all rely on data centres in our everyday lives and the more we use data, the more skilled individuals the sector needs to keep everything up and running – and that is where things have become stuck.

CRISIS POINT

The success of Industry 4.0 is reliant on data centres being pillars for data transfer and growth. Meanwhile, data centres are the backbone for the digital economy and the constant demand for data will only see the sector grow. This is great for the sector as a whole, however, without an increase in the talent pool it will struggle to meet ongoing demand.

Things are now reaching a pivotal point. The lack of new talent is pushing wages up and creating a poaching pool amongst organisations, with more having to offer increased financial and benefits packages to keep personnel from being enticed elsewhere.

In the wider world little is known about the importance of data centres and, unfortunately, not many people care. So how are they ever going to know the sector even exists and how are we ever going to meet the future staffing requirements? The truth is there is a serious lack of understanding about what career paths are available throughout the entire education system. The need for more awareness in schools and science, technology, engineering and mathematics (STEM) centres has become a particular area of debate in regard to who is responsible – is it those within the digital infrastructure industry or is it government?

BEST KEPT SECRET

Teachers and parents need to better understand data centres and the opportunities available within them. Only then will they be able to accurately and confidently teach children about what the sector has to offer. We will never be able to move forward and increase the talent pool if those within the learning space – teachers, tutors and parents– aren't talking and engaging with students about data centres and cloud computing.

Unfortunately, a lot of the courses STEM centres offer do not include data centres on the curriculum and do not even mention them. So, although students attend a STEM specific centre, they can spend their entire time never learning about or discovering the digital infrastructure industry or understanding what drives technology.

COMPETITION TIME

Different industries are competing for talent. Once a graduate comes out of

university with a degree in mechanical or electrical engineering, or completes their qualifications from a STEM centre, the first port of call is not usually the data centre sector but the likes of Jaguar, BT or Dyson. These organisations have entered STEM colleges and universities and created a presence in a proactive approach to protect the future skillset of their brand, entice new talent and develop creative ideas. They also have more clearly defined skills requirements and career progression routes, so new entrants have a clear vision of the career ladder they can climb.

This is where the data centre sector lags behind, as it is yet to set-up anything like this. This is also where leading data centre organisations need to be taking a stand to do something. Organisations across the digital infrastructure industry need to work together and unite to promote the industry and do it in a way that attracts young people, makes it more real and inspiring, and provides people with clear career routes and options.

LATE IN THE DAY

It's important to note that STEM centres are way too late in terms of resolving the skills shortage alone. There needs to be an additional focus on schooling and on the curriculum, before the age of 16, to ensure that all children are being introduced to the industry and the importance of STEM skills way before they reach the STEM centres. If they are not engaged early on, they will not discover the data centre sector and its potential opportunities.

Other industries have clearly defined career progression routes that offer inspiration and clarity. Teachers and parents are familiar with these and can

'Teachers and parents need to better understand data centres and the opportunities available within them. Only then will they be able to accurately and confidently teach children about what the sector has to offer.'

guide individuals in how to get started in a particular area of interest. A lot of data centre professionals and experts simply fell into their data centre roles over the decades as their roles naturally grew with demand – they didn't come looking for career in the data centre sector. Yet, once they retire how can we guarantee people will still keep just 'falling' into the industry?

Another question that needs to be answered is whether the data centre sector's workforce can continue to maintain the demands of the modern world and deliver the service we have become accustomed to. Organisations in the sector know that simply hiring new talent is not the answer, so upskilling and reskilling will have a major impact on filling vacancies.

AGE OLD PROBLEM

The industry is faced with an ageing workforce and there simply is not enough new talent coming directly into the data

centre sector with enough specific data centre experience to maintain the current talent pipeline. Organisations must start to consider hiring individuals with transferable skills from other industries. As individuals retire, the talent pipeline must be maintained and the sector needs to ensure they are training and developing all their teams, as well as using shadowing and mentoring techniques to give individuals real life on the job learning experience.

Data centre staff are demanding greater levels of salary yet not delivering greater levels of skill, new thinking and innovation. With a sector that relies heavily on security and immediacy of response, filling vacancies with people who do not add any value is a high-risk strategy.

The issues are complicated and need to be addressed by professionals with a consolidated approach and a clear understanding of what the sector actually needs. Knowing what skills are required now may not be the same requirements in several months' time. It also comes down to an organisation's core corporate strategy – a tick box approach and saying 'we need to do this' will not work. Real commitment to sustaining the workforce is imperative because, without it, there is no growth.

WORKING TOGETHER

The data centre sector underpins how we all stay connected. There are so many opportunities right now, with many organisations looking to take on new people and develop and educate them. Many people have unfortunately lost their jobs, so there has never been a more perfect time for the sector to be working together to encourage not only new talent through STEM centres but also those that have been made redundant and have

transferable skills, or those who fancy a new challenge, to consider a career in the digital infrastructure industry. ■

MICHAEL GARDNER
As CNet Training's program coordinator, Michael Gardner is responsible for managing and administering one of the company's largest educational contracts. Alongside his day-to-day role, he has recently graduated with a first class honours degree in business and management.

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