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THE NETWORK INFRASTRUCTURE E-M

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Number crunching

EDITOR
Rob Shepherd
07708 972170

SUB-EDITOR
Chris Marsland

ADVERTISING MANAGER
Kate Paxton
01603 610265

CREATIVE DIRECTOR
Vishnu Joory

TECHNOLOGY CONSULTANT
James Abrahams

CIRCULATION MANAGER
Debbie King

ACCOUNTS
Billy Gallop

Over recent decades the network infrastructure cabling sector has regularly introduced new iterations of copper and optical fibre technologies, each with greater bandwidth capabilities and operational features than the last. While innovation should always be welcomed, it's safe to say that some have been much more successful and widely adopted than others.

When it comes to copper, Category 5e was a definitely a game changer and Category 6A is fast becoming the number one choice for use in enterprise environments. In contrast, Category 7, 7A and 8 systems have remained stagnant with limited interest. Over the years fibre had maintained a steady evolution across both multimode and singlemode variants, with identifiable applications that have ensured wider adoption.

So the introduction of OM5 in 2016 remains something of a mystery. With very little difference from OM4 and the only real benefit over its predecessor being its ability to support shortwave wavelength division multiplexing (SWDM), OM5 has been met with ambivalence, low adoption and limited sales. To assess what the future holds for OM5, Inside_Networks has asked a panel of industry experts to offer their views.

This issue also contains a special feature dedicated to the subject of pre-terminated cabling solutions. Andy Hirst of Sudlows looks at the reasons behind the growing popularity of pre-terminated systems and offers some tips for a successful installation, while AFL Hyperscale's Damian Smart explains the benefits of using these solutions in data centre environments to save both time and money, and reduce waste.

We also look at UPS and power management, with Louis McGarry of Centiel explaining the need for manufacturers to develop more efficient UPS solutions. He's followed by Martin Ryder of Vertiv, who examines why a UPS is an essential component of any power management strategy at the edge.

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

Rob Shepherd
Editor

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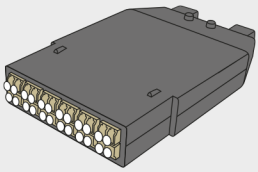
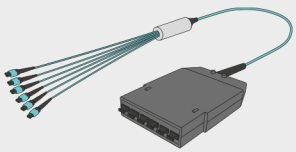
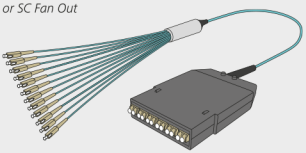


Cassette to MTP Fan Out



Cassette to LC or SC Fan Out



IN-AD-RNFIBRE-R30

Keysource highlights the data centre trilemma of balancing speed, substance and sustainability

Keysource's sixth annual State Of The Industry Report has highlighted the trilemma the data centre industry is facing in dealing with the competing challenges of developing and delivering on sustainability targets, the pressure to speed up project delivery to remain competitive, and continuing supply chain and skills issues. This is against a background of rising costs and new European Union and imminent UK regulation changes.


Jon Healy

The report gathered the views and insights of over 250 IT directors and senior data centre professionals. Jon Healy, chief operating officer at Keysource, commented, 'The pressure to speed up project delivery is perhaps the most concerning finding of the report, with 75 per cent of those surveyed identifying quality issues that could reasonably have been identified or better managed earlier. Certainly, we are seeing some organisations prioritising speed above all else, which is at best risky.'

The report shows that the skills shortage continues, with competing demand both client side and within the supply chain for the same people. As a result, nearly half of respondents chose to subcontract more projects or services than they had planned, as the industry turns even more to supply chain partners to keep to programme timescales. According to the majority of respondents, this approach had a positive impact including better quality and quicker delivery, with the inevitable trade off of higher cost.

There are some encouraging findings around sustainability. 69 per cent of respondents have a seat at the table when discussing sustainability targets and over half have a separate 'green budget' that can be used for sustainable solutions and initiatives.

17 per cent consider sustainability to be a high priority but less than a third said they were making significant progress with their sustainability strategy – with over half still not having one at all. In addition, 64 per cent of respondents haven't evaluated the carbon impact of existing data centre services and solutions, while 57 per cent aren't intending to evaluate future investments – meaning missed opportunities to make both carbon and financial savings.

Healy concluded, 'The inrush of available capital that we have seen enter the data centre market is reflective of its promising returns and the comparative performance of other markets. So, whilst this year's State Of The Industry Report shows that the data centre and related sectors continue to grow despite these challenges and the current global unrest, political scepticism and economic uncertainty, it also flags that a number of common challenges still remain and these are forcing decision makers to operate differently. Our industry has a clear trilemma to solve.'

Almost two thirds of UK network engineers set to retire in five years

According to research from Opengear, 61 per cent of UK based chief information officers (CIOs) expect at least 25 per cent of their network engineers to retire in the next five years. 74 per cent say that a shortfall in engineers has led to an inability to manage networks, while 64 per cent state that they are now struggling to meet user or customer expectations.


Gary Marks

The study surveyed 502 CIOs and 510 network engineers across the US, UK, France, Germany and Australia. It shows that 88 per cent of UK engineers have been forced to achieve more with fewer resources over the past three months, which is similar to those globally (87 per cent). To remedy this issue, both UK CIOs (42 per cent) and engineers (34 per cent) identify investment in automation, artificial intelligence and other emerging technologies as vital to addressing the tech skills shortage.

'As skills shortages persist, management solutions can empower IT teams to flexibly deploy, manage and remediate business networks. This allows them more time to focus on critical network tasks for better business performance and improved customer satisfaction,' said Gary Marks, president at Opengear.

63 per cent of IT workers are concerned generative AI will take their job

Ivanti has announced the results of its 2023 Report: New Imperatives For Digital Employee Experience, which details how technology drives employee satisfaction, retention and productivity. Ivanti surveyed 7,800 IT professionals, executives and end users around the world to gauge their opinions on the current state and future of digital employee experience including how they believe the advancement in artificial intelligence (AI) will impact them.


Jeff Abbott

While many IT workers see the productivity benefits of AI, 56 per cent believe it benefits employers more than employees. Additionally, 63 per cent are concerned generative AI tools might take their job in the next five years, compared to 44 per cent of office workers.

'Organisations globally are grappling with how to optimise the digital employee experience for the entire workforce,' said Jeff Abbott, Ivanti's CEO. 'Best in class organisations view digital employee experience as a powerful tool to improve accessibility, employee retention and the security of their organisation. However, with the rapid progress of AI and automation, the real digital employee experience opportunity is for organisations to enhance employee productivity, speed and value creation with the best possible IT solution platform.'

SMEs missing out on £6.9bn by failing to embrace the cloud

UK small and medium sized enterprises (SMEs) are missing out on £6.9bn by failing to digitise and move to the cloud, according to a report from Amazon Web Services (AWS). The study also suggested that embracing cloud computing would create an extra two million jobs and turbocharge the UK's health and education sectors.

The Realising A Cloud-Enabled Economy: How Micro, Small, And Medium Sized Businesses Drive Economic Growth And Societal Impact report was commissioned by AWS and examines the potential benefits of moving to the cloud. It also addresses the societal issues that could be addressed through such a shift.

Josh Boer, director at AWS consultancy VeUP, said, 'SMEs are the lifeblood of the UK economy, yet far too many are operating outdated business models and failing to exploit the benefits of digital transformation. From getting access to generative AI tools to reducing costs and scaling up rapidly, cloud environments are the secret sauce and it's absurd that so many ambitious start-ups are missing out.

Data centre sector warned not to dismiss water security

In the USA it is estimated around 20 per cent of data centres are built where water is moderately or highly stressed, and in arid or water starved regions. Typically, a large air cooled data centre (30-50MW) consumes the equivalent of an Olympic sized swimming pool every day – around 25 million litres.

Measuring and reporting water usage is not currently a requirement for data centres, however, as communities become more aware of the issues surrounding drought and data, this may well change. Martin Bradburn, CEO of PeaSoup, commented, 'Hyperscale data centres are perfectly positioned to review and change their water consumption and there are numerous options available. It is only a matter of time before the consumption of scarce resources like water needs to be declared. Why not move to a more sustainable option now?'

82 per cent of firms have changed to accommodate hybrid working

82 per cent of businesses have changed their office space needs to accommodate a flexible working approach, which includes more than half of businesses opening offices or working spaces outside of city centres, according to a survey of 500 businesses from IWG. It found that 54 per cent of organisations now have offices or co-working spaces outside of main city centres, while 38 per cent have second locations in commuter towns, as businesses attempt to accommodate staff who desire more flexible working.


Sridhar Iyengar

Employers are said to face challenges regarding the new flexible approach and the statistics support this claim as businesses attempt to accommodate the needs of staff. 73 per cent of businesses have been able to cut their office space costs as a result of reduced central city office space needs, while 36 per cent say they are paying less in expenses for staff travel.

Sridhar Iyengar, managing director at Zoho Europe, commented, 'Working models have changed in recent years due to the Covid-19 pandemic. Businesses should focus on adapting to new working models to accommodate the needs and wants of their workers and improve employee experience, in order to stay competitive.'

NEWS IN BRIEF

Kao Data has appointed David Bloom as its new chairman.

The UK government has announced £8m funding to create 800 new artificial intelligence (AI) scholarships as part of a new £60m Regional Innovation Fund (RIF). The RIF will boost support for universities in areas with lower levels of research and development, as part of a wider initiative to spread AI skills across the UK.

Gopichand Katragadda has been appointed as the 142nd president of the Institution of Engineering and Technology (IET). He will be the first Indian in the history of the IET to assume this role.

Mitel has closed on its previously published plans to acquire Unify. The transaction cements the combined company as a global powerhouse in the unified communications (UC) space, with a number two position in global market share for enterprise UC.

Adam Allen of Geoffrey Robinson has been recognised as one of the country's leading electrotechnical and engineering services apprentices, after winning the 2023 ECA Edmundson Apprentice of the Year Award.

Bulk Data Centers has signed a partnership agreement with HGC Global Communications.

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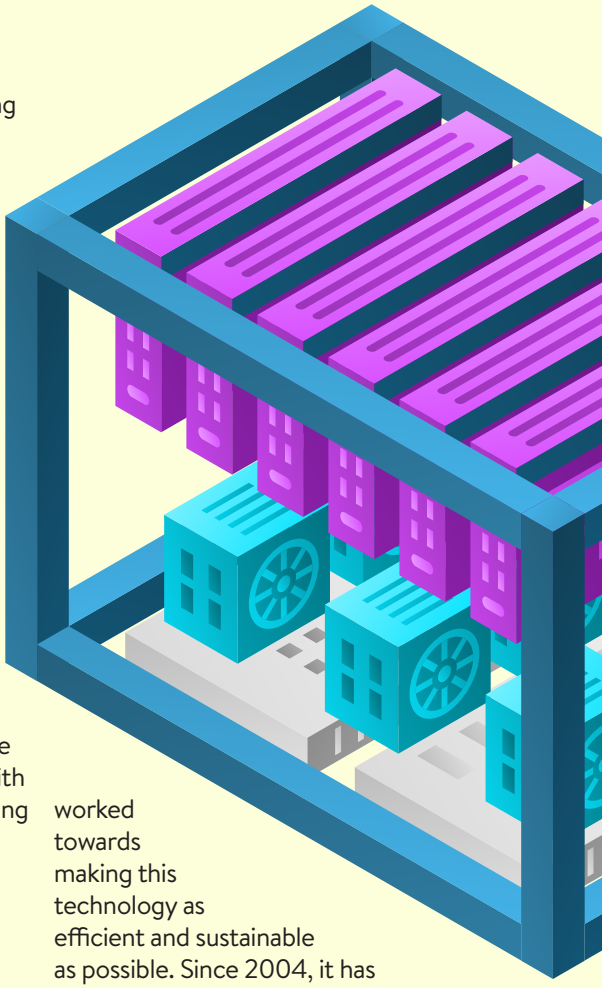
Hybrid cooling is the f

Hi Rob



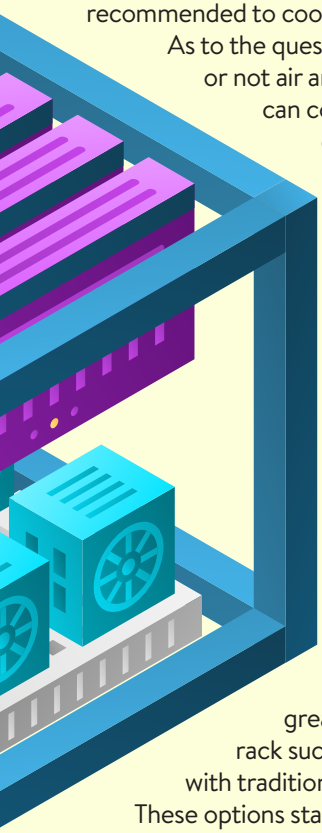
Rising rack and power densities are driving significant interest in liquid cooling for many reasons. Yet, the suggestion that one size fits all is potentially hindering adoption and many data centre applications will continue to utilise air as the most efficient and cost effective solution for their cooling requirements. Therefore, the future is undoubtedly hybrid – by using air cooling, containment and liquid cooling together, owners and operators can optimise and future proof their data centre environments.

Many data centres are experiencing increasing power density per IT rack, which has risen to levels that just a few years ago seemed extreme and out of reach. They are also simultaneously deploying air cooling. In 2020 the Uptime Institute found that due to compute intensive workloads, racks with densities of 20kW and higher are becoming a reality for many data centres.

This increase has left data centre stakeholders wondering if air cooled IT equipment, along with the containment used to separate the cold supply air from the hot exhaust air, has finally reached its limits and if liquid cooling is the long-term solution. The answer is not as simple as yes or no, however. We need to understand what's driving the need for liquid cooling, as well as the other options.

With air being the primary source used to cool data centres, the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) has worked towards making this technology as efficient and sustainable as possible. Since 2004, it has published a common set of criteria for cooling IT servers, with the participation of IT equipment and cooling system manufacturers. The latest edition – TC9.9 Thermal Guidelines for Data Processing Environments – highlights a new class of high density air cooled IT equipment called H1 class. This focuses more on cooling high density servers and racks with a trade-off in terms of energy efficiency due to

uture for data centres



lower cooling supply air temperatures recommended to cool the IT equipment.

As to the question of whether or not air and liquid cooling can coexist in the data centre white space, it has done so for decades already. Moving forward, many experts expect to see these two cooling technologies coexisting for years to come.

There are several approaches the industry is embracing to cool power densities up to, and even greater than, 35kW per rack successfully – often with traditional air cooling.

These options start with deploying either cold or hot aisle containment. If no containment is used rack densities should typically be no higher than 5kW per rack, with additional supply airflow needed to compensate for recirculation air and hotspots.

At some point, high density servers and racks will also need to transition from air to liquid cooling, especially with central processing units (CPUs) and graphics processing units (GPUs) expected to exceed 500W per processor or higher in the next few years. But this transition is not automatic and isn't going to be for everyone.

Liquid cooling is not going to be the ideal solution or remedy for all future cooling requirements. Instead, the selection of liquid cooling instead of air cooling has to do with a variety of factors including specific location, climate (temperature/humidity), power densities, workloads, efficiency, performance, heat reuse and the physical space available.

This highlights the need for data centre stakeholders to take a holistic approach to cooling their critical systems. It will not, and should not, be an approach where we're considering only air or only liquid cooling moving forward. Instead, the key is to understand the trade-offs of each cooling technology and deploy only what makes the most sense for the application.

Gordon Johnson
Subzero Engineering

Editor's comment

Despite the data centre sector waxing lyrical about liquid cooling at every opportunity, and with good reason, Gordon makes some excellent points about the reality of the situation. Many data centres will continue to use air to cool their facilities, mainly because the infrastructure is in place. Rather than taking and 'rip and replace' approach most will choose a phased transition, meaning that liquid and air cooling will coexist for some time to come.

Mitigating the effects of

Hi Rob

One of the largest challenges raised during the United Nations Climate Change Conference (COP27) was reparation for the three and a half billion people living in countries highly vulnerable to climate impacts. The UN chief called for progress on adaptation and building resilience to future climate disruption.

However, adaptation requires more than handing funds to devastated communities. From improving food security and providing clean water to reducing the environmental impact of farming and tracking the risks to life related to weather events, innovation is essential.

Yet, how can effective change be achieved without a detailed understanding of the current situation? How can farmers transition to a different climate and embrace smart farming or Agriculture 4.0 practices without the information needed to support more effective farming methods or the ability to remotely monitor livestock, equipment and soil?

The internet of things (IoT) has an important role in supporting change and innovation. Farmers are currently exploring IoT to remotely monitor soil moisture and temperature as part of efforts to reduce water consumption, while optimising productivity, as well as to track animal health and wellbeing. Environmental tracking enables climate experts to monitor the speed at which change is occurring – from the reduction in emissions created by farming, to the recovery of deep sea habitats and remote snow, glacier and permafrost monitoring stations in Central Asia.

Yet, when 15 per cent of the world is covered by terrestrial communication networks, too many of the most vulnerable communities remain unconnected and unable to benefit from this innovation. For systems integrators, the addition of satellite connectivity to IoT solutions is powerful, enabling companies to take tried and tested solutions quickly to new markets.

The availability of a satellite connection designed specifically for widescale IoT deployment has transformed the opportunity. But does the business case for a satellite connection designed specifically for widescale IoT deployment stand up, especially when the cost/benefit argument is under incredible scrutiny?

f environmental change

Most operational IoT applications do not need the continuous or real time communication associated with high cost, power hungry satellite links that have made such solutions completely unaffordable. Instead, vital solutions like tracking the location of farm animals, measuring the earth moisture content or monitoring the health of vulnerable habitats can be delivered with lower cost intermittent satellite communication.

Minimal power consumption and the ability to link to solar power are, for example, key considerations when attaching an IoT sensor to a water filter, to livestock or farm equipment many miles from maintenance services. 10 year battery life is a significant factor in building a powerful business case, as is antenna design and robustness of equipment and battery life. Two way communication is also valuable, for example, if the systems integrator wants to increase the frequency of recording in a specific location from once to twice a day.

Countries and organisations are actively investing to support environmental change, especially within agriculture. However, without ubiquitous access to network connectivity, there will be an unfair difference in the speed with which countries, organisations and individuals can make changes and adopt innovations such as smart farming or Agriculture 4.0 practices.

With the addition of low cost satellite IoT, innovative solutions that were previously restricted by the lack of terrestrial/cellular connectivity in locations outside the mainstream areas of network coverage, countries and organisations, can now implement equitable change quickly and effectively.

Eric Menard
Astrocast

Editor's comment

This is a fascinating subject and Eric makes convincing case for IoT's key role in supporting innovation. As countries come together to address the implications of climate change and deliver solutions for those communities most at risk, it is vital to deliver ubiquitous access to smart technology, especially in developing nations.

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Five alive?

Despite offering higher bandwidth capabilities for short reach connections than its predecessors, OM5 optical fibre cabling is frequently ignored in favour of singlemode in data centres. Inside_Networks has assembled a panel of industry experts to explain why and examine whether OM5 has a future

When it was introduced in 2016, OM5 became the latest iteration of multimode optical fibre. Its ability to support shortwave wavelength division multiplexing (SWDM) – the simultaneous transmission of multiple wavelengths over a single fibre strand across short distances – made it ideal for data centres.

One of the primary advantages of OM5 is its compatibility with OM3 and OM4, allowing for seamless integration. This means that organisations can upgrade their networks to support higher speeds without the need for a complete overhaul.

Although OM5 offers improved bandwidth, its maximum reach is still limited compared to singlemode, which can be a drawback for long distance applications such as hyperscale data centres. Meanwhile, although they are still more expensive, singlemode transceivers have become more affordable and typically use duplex transmission, reducing cabling complexity.

So despite its promise, OM5 has had a lukewarm reception and limited uptake. Inside_Networks has assembled a panel of experts to offer their views on the future of OM5 and whether, as data rates move past 400Gb/s to 800Gb/s and beyond, singlemode is the way to go.

CARRIE GOETZ

PRINCIPAL AND CHIEF TECHNOLOGY OFFICER AT STRATEGITCOM

I think part of the reason that the uptick for OM5 hasn't been what everyone wanted it to be is due to a few factors. The first is optical fibre fatigue.

Fibre is generally sold as a long-term connectivity solution. Users were sold on the premise that their fibre would last through multiple iterations of equipment. For many years singlemode and multimode fibre were touted as the best long-term solution over copper. But then every few years a new grade or type of multimode is introduced, while singlemode has only had that happen once, proving its longevity.

Companies are tired of expendable infrastructure. Plainly put, they are fed-up with throwing the baby out with the bathwater. Environmental, social and governance (ESG), alongside other sustainability focused goals, highlight longevity with respect to material use. Every component matters and companies are keeping their equipment for longer periods of time. I believe we have reached a period of upgrade fatigue.

When considering upgrades and replacements, overall costs are evaluated differently now than they were 10 years ago. New equipment is evaluated based on power consumption, functionality, unused ports, lifecycle, what it is attached to at the other end, and any number of other factors. Even within a preferred vendor's product line, certain ports and equipment will end up not being popular and become less viable in a long-term strategy. Just because a standard is written, there is no guarantee of product acceptance or longevity.

Furthermore, the cost of singlemode components has changed greatly thanks to hyperscalers and hearty data consumers, who have driven down component costs. For many years, multimode electronics provided a more cost effective path for smaller enterprises. Singlemode electronics used to be on average 10 times the cost of their multimode counterparts. Today, that cost is more like two or three times the cost for higher performance, less risk, less complicated infrastructure, longer performance and other factors.

The costs associated with installation, rip out, replace, recycle and downtime all go away with a longer lasting infrastructure channel.

'ESG AND OTHER SUSTAINABILITY FOCUSED GOALS HIGHLIGHT LONGEVITY WITH RESPECT TO MATERIAL USE. EVERY COMPONENT MATTERS AND COMPANIES ARE KEEPING THEIR EQUIPMENT FOR LONGER PERIODS OF TIME. I BELIEVE WE HAVE REACHED A PERIOD OF UPGRADE FATIGUE.'

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One of the main factors contributing to the low uptake of OM5 optical fibre is its cost. OM5 fibre is more expensive than OM4, which makes it less attractive for data centre operators, especially when considering the large scale deployment required in such environments. OM5 cabling costs about 20-30 per cent more than OM4.

If you look at the cost of a full 100Gb/s channel, including bi-directional (BiDi) transceivers, the amount per channel is still 30-40 per cent more than 100GBASE-SR4 supported by OM4. The cost of upgrading existing infrastructure to support OM5 fibre can be a significant barrier for many organisations.

Compatibility is another issue that hinders adoption of OM5. While OM5 is backwards compatible with OM4 and other multimode fibres, it requires special transceivers that can operate over a wider range of wavelengths. This compatibility is achieved through the use of mode conditioning patch cords. It is important to consider the compatibility requirements when planning to upgrade or integrate OM5 fibre into an existing infrastructure, which can be complex and costly.

Furthermore, the emergence of alternative solutions, such as singlemode fibre, has also impacted the adoption of OM5. As the demand for higher data rates and longer distances continues to increase, data centre operators may find it a more long-term sustainable option to invest in singlemode infrastructure rather than upgrading to OM5.

In scenarios where OM4 has reached its limits, it does make more sense to consider singlemode fibre. Singlemode allows for better transmission over longer distances at higher speeds. It is also more cost effective in the long run, as it provides greater scalability and long-term sustainability.

All of that said, the future of OM5 fibre in data centres is not entirely bleak. It still has advantages, particularly in short reach applications where its wideband capability can be leveraged to support multiple wavelengths. It can be a viable option for data centres requiring shorter distances and multiple parallel links. An example would be high performance computing environments where there is a need for fast and reliable communication between nodes. It enables the efficient transfer of large volumes of data between processors and storage systems, facilitating complex computational tasks.

‘THE FUTURE OF OM5 FIBRE IN DATA CENTRES IS NOT ENTIRELY BLEAK. IT STILL HAS ADVANTAGES, PARTICULARLY IN SHORT REACH APPLICATIONS WHERE ITS WIDEBAND CAPABILITY CAN BE LEVERAGED TO SUPPORT MULTIPLE WAVELENGTHS.’

RICHARD EDNAY

TECHNICAL DIRECTOR AT OPTICAL TECHNOLOGY TRAINING

The uptake of OM5 compared with other multimode fibre types concerns costs and benefits. For example, in a hypothetical situation where OM5 is the same price as other multimode fibres, then obviously the uptake of OM5 would be much greater. Given that the fundamental technology is the same and the manufacturing costs similar, it comes down to the cabling vendors' pricing policy. Obviously, vendors want to charge more for premium products but the price premium needs to be in proportion to the benefits or cost savings achieved.

With OM5, the benefit over OM4 is only seen if SWDM technology is used to provide higher dates over longer distances using fewer fibres. So, quantifying the benefits becomes highly dependent upon the data rates and distances in your network, as well as the cost of SWDM transceivers.

For example, at 100Gb/s, OM5 will support a 150m distance using SWDM4 on a pair of fibres. OM4 will support 100m with the same transceiver, currently available for around £320, but will also support the same distance with the much cheaper (<£100) SR4 transceiver over four pairs of fibres. Does this benefit justify the hefty price tag of OM5 – a 70 per cent premium for example? I don't think so, especially if all your data centre links are less than 100m!

The other part of the question is about multimode versus singlemode and, again, this is highly dependent upon data rates, distances and the costs of transceivers. In general, the lowest cost multimode transceivers are about half the price of the lowest cost singlemode transceivers. So, considering 100Gb/s, the cheapest singlemode transceivers are £200-£300, but they will support longer transmission distances of 500m-2km.

At 400Gb/s the economics are similar, with 100m still supported on multimode, although the new very short range (VSR) distance option for up to 50m may potentially lower costs. However, with the new work on 800Gb/s and 1.6 Terabit Ethernet, it is looking as though it might be the end if the road for multimode, as it is not included in the current set of IEEE 802.3dj objectives.

> 'WITH THE NEW WORK ON 800GB/S AND 1.6 TERABIT ETHERNET, IT IS LOOKING AS THOUGH IT MIGHT BE THE END IF THE ROAD FOR MULTIMODE, AS IT IS NOT INCLUDED IN THE CURRENT SET OF IEEE 802.3DJ OBJECTIVES.'

CHRIS FRAZER

PRINCIPAL CONSULTANT AT LAYER ZERO SERVICES

A key factor in deciding which type of optical fibre to install is cost, but not necessarily of the fibre! Transceivers can be more expensive than the fibre connecting them. Historically, singlemode transceivers have been significantly more expensive than their multimode counterparts, providing a large market for multimode cable and transceiver manufacturers.

The blurred line is where the distance and throughput of multimode and singlemode overlap. OM4 provides cost effective throughput from 1Gb/s to 100Gb/s using various connectivity methods. Typically, beyond 10Gb/s, OM4 utilises multiple cores to deliver the throughput, hence multiple transceivers.

OM5 was designed to support multiple wavelengths on the same core, to increase transmission distances and reduce the number of cores and transceivers required compared to OM4 for the same link. For example, OM4 using eight cores and eight transceivers (four at each end) could be replaced by OM5 using two cores and two transceivers (one at each end).

For a greater take up of OM5, the two fibre transceivers must cost compare well against those used on equivalent OM4 multi-fibre solutions. It appears that transceivers specifically for OM5 aren't yet attracting the attention of manufacturers in large volumes. There is clearly a chicken and egg situation with cable deployment and transceivers to overcome.

Upgrading electronics over the lifetime of the cable plant is also a factor. The number of throughput upgrades the OM4 or OM5 can be expected to accommodate before replacement must be considered. Could OM5 support >100Gb/s in the future?

Singlemode is an attractive option. It is unlikely to be superseded in its lifetime, it has practically unlimited throughput, no expected length limitations in a data centre environment, typically 2-core links and is a cheaper cable than equivalent multimode. The drawback is the cost of singlemode transceivers. Their cost is reducing over time in comparison to multimode though, but this varies greatly depending on manufacturer.

It wouldn't be the first time that a cabling solution was developed that never found key applications to ensure its wider adoption. Promoters of OM5 cable and transceivers have a lot of work to do!

'IT WOULDN'T BE THE FIRST TIME THAT A CABLING SOLUTION WAS DEVELOPED THAT NEVER FOUND KEY APPLICATIONS TO ENSURE ITS WIDER ADOPTION. PROMOTERS OF OM5 CABLE AND TRANSCEIVERS HAVE A LOT OF WORK TO DO!'

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ECA

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MICHAEL AKINLA

BUSINESS MANAGER NORTHERN EUROPE AT PANDUIT

Data centres are transitioning with drivers like sustainability and densification, as central processing units (CPUs) and graphics processing units (GPUs) massively increase power consumption and processing capability. Data centre operators and multi-tenant data centre (MTDC) customers are following the technology trends and prefer singlemode and OM4 multimode cabling systems.

Costlier OM5 is not as relevant in a data centre discussion due to no significant reach improvement over OM4. Although OM5 significantly improves modal bandwidth at 940nm, modern transceivers operating beyond 25Gb/s per wavelength do not utilise those longer wavelengths.

For 850nm transceivers, OM5 is identical to OM4. The latest standards for 800Gb/s and 1.6Tb/s released this year by the Terabit BiDi MSA only utilise wavelengths below 920nm. Therefore, OM5 does not provide significant performance advantages relative to OM4 and no advantage relative to an optimised OM4. For these reasons, OM5 has become less relevant for high speed data rates.

Leading optimised OM4 cabling has significant improvements over standard OM4, especially when using BiDi optical transceivers like 400GBASE-SR4.2-BD that operate at 850nm and 910nm wavelengths. This is achieved by correcting modal and chromatic dispersions simultaneously. This improved performance is increasingly important when we consider the three key elements of cable infrastructure:

- Latency. Optimised OM4 provides reduced packet error rate (PER), lowering the number of packet resends and data congestion.
- Availability. Optimised OM4 guarantees the deployment of a high reliability network infrastructure.
- Throughput. This is tied to bandwidth, payload size and PER. It allows for larger packets and reduced PER, improving the data journey.

With data centre customers expecting applications to work faster and with larger datasets, OM4 offers a cost effective solution for the rack and internal data centre interconnect, although singlemode is considered as the preferred solution for deployment in general. Optimised OM4 provides a positive cost differentiation over singlemode systems, while offering capacity to 100 and 400 Gigabit Ethernet and up to 32Gb/s/64Gb/s/128Gb/s Fibre Channel. Vertical cavity surface emitting laser (VCSEL) based multimode fibre transceivers are also more power efficient than singlemode transceivers, providing better reliability and robustness against contamination.

Therefore, data centre operators can still benefit from OM4 deployment when the operational requirements, sustainability and the financial margins are considered.

'DATA CENTRE OPERATORS AND MTDC CUSTOMERS ARE FOLLOWING THE TECHNOLOGY TRENDS AND PREFER SINGLEMODE AND OM4 MULTIMODE CABLING SYSTEMS.'

TONY WALKER

GLOBAL FIBRE PRODUCT MARKETING MANAGER AT SIEMON

The major reason for the relatively low uptake in OM5 deployments in data centres is that there is no application driving adoption. With OM5 you will get the same optical performance at the same distances – for a higher cost.

The most common 100Gb/s application, 100G-SR4, sees no distance advantage from OM5 over OM4 – the distance limitations are identical. There are some applications, 100G-SR-SWDM4 as an example, where a network manager would gain an additional 50m from using OM5 but for most applications there is no difference.

In addition to the technical aspect, there are also the cost and supply chain concerns. OM5 is more expensive and, in a chicken and egg scenario, the supply chain is more challenging due to lower volume. For 100m and below applications, OM4 is a widely available great choice for most of your networking needs. Even when considering 400Gb/s or 800Gb/s and beyond, there just aren't the application requirements for OM5.

In situations where the distances are greater than those OM4 can support, or signal degradation is a concern, users should utilise singlemode (OS2) fibre. With costs on par or below OM5, a very robust supply chain, as well as being a deeply understood and deployed technology, singlemode fibre is a great option to meet your network needs. Building an infrastructure based on singlemode fibre will also offer a migration path for your network to future higher speed applications.

I'm not sure what the future holds for OM5 as, currently, there is no common need for this technology. As networks continue to migrate to higher speeds (800Gb/s and above), the use of short run OM4, coupled with longer run singlemode or a complete singlemode network just makes more sense – from both a technological and financial perspective.

'WITH COSTS ON PAR, OR BELOW OM5, A VERY ROBUST SUPPLY CHAIN, AS WELL AS BEING A DEEPLY UNDERSTOOD AND DEPLOYED TECHNOLOGY, SINGLEMODE FIBRE IS A GREAT OPTION TO MEET YOUR NETWORK NEEDS. BUILDING AN INFRASTRUCTURE BASED ON SINGLEMODE FIBRE WILL ALSO OFFER A MIGRATION PATH FOR YOUR NETWORK TO FUTURE HIGHER SPEED APPLICATIONS.'

Delivering on promis

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

Centiel designed and developed the first three phase transformerless uninterruptible power supply (UPS) and the first, second, third and fourth generations of true modular, hot swappable UPS. The company's class leading CumulusPower now protects over 200MW of critical power loads in locations across the world including throughout Europe, the Middle East, Asia Pacific and South America.

On target

This year, following four years' development, Centiel launched StratusPower to provide complete peace of mind in relation to power availability, while helping data centres to achieve net zero targets. StratusPower shares all the benefits of the award winning CumulusPower three phase, true modular UPS.

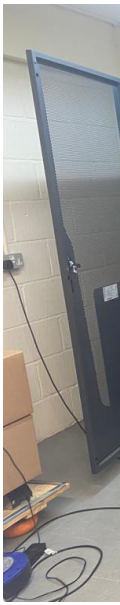
StratusPower's features include nine nines (99.9999999 per cent) availability to effectively eliminate system downtime, class leading 97.6 per cent on-line efficiency to minimise running costs, and true hot swap modules to eliminate human error in operation. Importantly, it also includes long life components to improve sustainability.

Uniquely, StratusPower has a 30 year design life and is almost completely recyclable, providing peace of mind in relation to power availability, while helping data centres to achieve net zero targets. StratusPower minimises total cost of ownership (TCO) because of its class leading efficiency and low maintenance costs. It is also fully scalable, so is unlikely to be outgrown.

Ask the experts

Centiel's experienced team can advise on the most appropriate options for organisations looking to improve their approach to sustainability by reducing their carbon footprint, as well as maintaining the highest level of availability for critical power protection. Centiel's experts act as trusted advisors to data centres and facilities across the UK and globally to ensure they always have the optimal UPS solution to reduce their TCO and maximise their uptime – whatever their requirement.

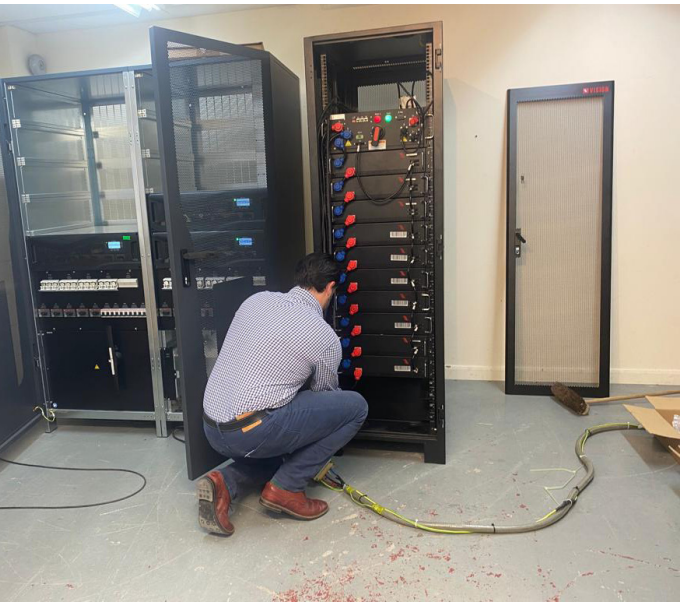
Centiel also offers some of the fastest delivery times in the industry. Even in the midst of a component shortage, Centiel ensures timely delivery within 4-6 weeks from the date of order. It achieves this through close collaboration and working hand in hand with long-term suppliers that are flexible and trustworthy, and can offer a stable supply of goods.



ses

centiel
continuous power availability

Centiel's strong partnerships with worldwide suppliers allow it to source the highest quality components efficiently and ensure an uninterrupted flow of materials. This strategic approach means it can always deliver on its commitment to excellence for its valued customers. For facilities that require shorter delivery times, please contact one of Centiel's sales managers and they will always do their best to deliver within your timeframe.



On your side

The members of Centiel's sales team are all engineers and UPS solutions experts, and are not required to 'sell' UPS. They are, however, required to establish long-term relationships with clients and consultants by offering a wealth of experience and expertise. They take time to understand the challenges faced by organisations and always provide the best advice in relation to solutions. If, for example, the best solution is 'don't change the current UPS' then this is the advice given. Centiel wants its customers to be able to pick up the phone and discuss the best options available for them now and in the future, knowing they will always receive excellent advice and recommendations based on best practice.

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

www.centiel.co.uk

Get it right first time

Andy Hirst of Sudlows looks at the reasons behind the growing popularity of pre-terminated cabling systems and offers some tips for a successful installation

The debate over the use of pre-terminated systems continues, although there does seem to be a higher uptake of this solution for obvious reasons. A pre-terminated solution can be deployed for most projects – from office fitouts to data centres. However, due to the high demand for data centres, these facilities seem to be having the greater uptake but it is clear one solution does not fit all.

ON THE PLUS SIDE

The main positives are reduced time required on-site by engineers who would usually be required to carry out the terminations. Industry statistics state pre-termination can be up to 75 per cent faster than terminations carried out in the field.

Furthermore, due to terminations being carried out in a controlled factory environment, there is less risk of faults. Then there's the cable testing – as opposed to restricted operation in the confined area of an IT cabinet, with factors such as poor lighting, dust and non-continuous working, this is conducted in a more comfortable environment. The fact that factory terminations are more controlled when compared to field terminations can only improve the cable performance. Put simply, the quality control will be more rigorous.

The thought of test results and certification being supplied along with the pre-terminated cables, without a bottleneck of test result certifications to carry out, makes a pre-terminated solution very attractive. As does mitigating the potential for lost test results – we've all been there! All performance testing from transmission testing through to crosstalk will be carried out and certified, just leaving minimum testing required after install.

OTHER FACTORS

A pre-terminated solution might well sound preferrable but consideration also needs to be given to factors such as the length of cable runs and the routes they take. Clearly, if pre-terminated ends are pulled through multiple room entry points, along corridors and grey space, the chance of some of the terminations being damaged increases. In such situations the positives of using pre-terminated cable systems can suddenly become a hinderance, adding additional time and cost to a project. This scenario is in contrast to short cable runs within one data hall, where the risk of damage to the cable would be minimal.

If, once the project has been assessed, the type and length of run determined and the analysis shows it is cost effective to use a pre-terminated solution, then it will be of paramount importance for the route to be accurately surveyed and audited. This is regardless of whether it is carried out on-site or using design drawings, as another potential pitfall and consideration is how the cables are being run and what, if any, containment the cable is being installed into.

MADE TO MEASURE

No matter how good the measurements are, there will still be an element of slack left after terminating, which if on view

'The thought of test results and certification being supplied along with the pre-terminated cables, without a bottleneck of test result certifications to carry out, makes a pre-terminated solution very attractive.'

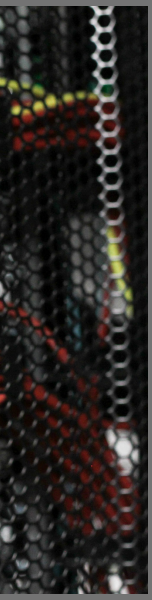
in basket or tray could look unsightly. Equally, cables that have been undermeasured and are too short could impact the cost of the programme and have a detrimental effect on the waste and carbon reduction that, in the present climate, is being watched closely by clients.

On the other hand, if the cable containment is out of sight – such as under the floor or in a false ceiling – it should not be an excuse for complacency and poor measurements. Although hidden away, not only could poor measurement add additional cost to the project, but when coiled up it could hinder airflow from the cooling units. This could have a particularly detrimental effect, especially if higher density IT equipment is deployed.

WASTE NOT WANT NOT

As alluded to earlier, there is also the impact

on the environment to factor in. Consider a facility with thousands of cables requiring terminating. This will take several weeks of an engineer travelling to and from site in their vehicle, as opposed to a factory engineer working at their local office or factory.



Also, consider the reduction in cable drums, boxes and waste cable when the solution is pre-measured and cut to length. In these controlled environments there will be minimal waste. All aspects of sustainability will require consideration. In addition to the reduction in carbon, you also reduce time on-site for the engineer, who could be deployed elsewhere. From a client's point of view, the less time an engineer is on their site the better due to security risks, client management and general housekeeping.

JOINED UP THINKING

Designers, construction companies, end users and manufacturers need to pull together to ensure that pre-terminated cables are a viable option. At present, something that sometimes excludes the use of pre-terminated cables is the cost. Although it is a more efficient option, the cost does not seem to always be comparable to on-site terminations. If this solution is being marketed for its positives such as sustainability, then manufacturers must not be able to take advantage by raising costs.

A further point to consider is the cost of splice machines and test equipment, as well as the numbers of splicers required on multiple sites. With pre-terminated systems this is dramatically reduced, as is the risk of damage or theft of these machines, which could delay works and impact the programme.

HORSES FOR COURSES

The benefits of pre-terminated cables, in whatever form they are used, outweigh the negatives greatly – but only on the right project and environment, and with the correct type of containment. The key to success is accurate site measurement and labelling by an experienced surveyor to ensure minimal excess cable and avoid the cable being too short. If this doesn't happen a project can quickly become a commercial nightmare. ■

ANDY HIRST

Andy Hirst is managing director of Sudlows' Critical Infrastructures division. With over 30 years' experience in the M&E environment, he heads up a team offering high quality, effective and innovative designs for critical infrastructure projects.

XSiCute

Based in West Sussex, XSiCute has been building bespoke optical fibre patch cables and harnesses for over a decade, becoming the partner of choice for many busy installers.

Factory pre-terminated fibre harnesses versus on-site custom made counterparts. What are the advantages?

- Have peace of mind on your projects. By taking away some of the headaches from installations, you can ensure you get ahead and save time on-site.
- Make life easier and eliminate setbacks with unknown issues. You'll feel less negative impact from issues like staff availability and site accessibility.
- Save time and reduce installation complexity on-site. Our connectors are professionally terminated with precision in a controlled environment, minimising risk of human error and ensuring consistent, high quality connections.
- Need something bespoke? Customisable factory pre-terminated fibre harnesses are a smart choice for those seeking a fast, reliable, flexible and cost effective solution for their network installation needs.

Want to find out more? Get in touch!

CLICK HERE to find out more, call XSiCute's sales team on 01908 972765 or **CLICK HERE** to send us an email.

www.xsicute.com

Cable Management Warehouse (CMW)

CMW's pre-terminated sealed outdoor enclosure provides a fast and flexible solution for connecting subscriber/customer drop cables. It benefits from a unique 89m span, enabling it to go across major carriageways, as well as having daisy chain capability.

www.cmwltd.co.uk

It is Physical Infrastructure Access (PIA) approved and evolve compatible, working seamlessly with existing installations. The drop cables can be quickly and easily plugged into the enclosure without the need for splicing or any specialised technical skills.

IP68 grading means it can be installed on to a pole, wallmounted or put underground in manholes. The bracket supplied with the IP68 enclosure enables installation to either a wall via screws or on a pole using straps.

Being supplied on a recyclable cardboard reel makes this enclosure an environmentally friendly option. Fully customisable solutions can also be provided.

To find out more about this product **CLICK HERE** or get in touch by calling 01234 848030.

www.cmwltd.co.uk

Complete Connect

Complete Connect's MX Xpress is a fast, simple way to add new optical fibre links. The pre-terminated modular cassettes cut through the complexity of installation, reducing time spent on-site and saving on labour costs.

Factory terminated and test certified, MX Xpress is ready to use for immediate patching between LC duplex ports in data centres, small and large corporate LANs or telecommunication exchanges. Cassettes present six or 12 LC duplex ports (12 or 24 fibre) per cassette. Used with Complete Connect's versatile MX panels, you can achieve 60 LC duplex ports in a 1U panel (five cassettes) or 120 LC ports for a 2U panel (12 cassettes).

As a modular fibre solution, MX Xpress cassettes can be housed alongside multiple connectivity solutions including MTP (MPO), TAP modules and keystone copper links – all in the same panel.

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

HellermannTyton

RapidNet is HellermannTyton's fully patented pre-terminated, pre-tested modular cabling system, which eliminates the need for on-site terminations and reduces 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 (optical fibre) and, because it is pre-tested, minimal on-site testing is required once installed.

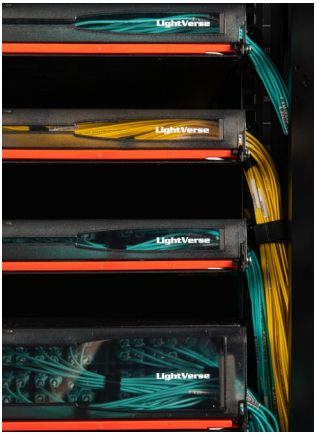
The pre-terminated solution delivers high performance across all formats including Category 6A and Category 6 in copper and OM5, OM4, OM3 and OS2 in fibre. The Category 6A and fibre solutions will support high speed 10 Gigabit Ethernet networks and beyond. High port densities can be achieved using RapidNet 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

Siemon

Fibre optic cabling has become the dominant connectivity medium in today's data centre environments and continues to grow in importance for intelligent building and LAN spaces. This adoption has been driven by the emergence of new technologies and an increasing range of applications, which are all demanding higher bandwidth and low latency transmission.



Delivering an industry leading combination of high performance cabling and high speed deployment, Siemon's innovative range of pre-terminated fibre optic plug and play solutions are the ideal fit.

We pride ourselves on our engineering heritage, innovation and our data centre pedigree. We've taken this passion and focused it into a truly world class portfolio of advanced fibre optic plug and play solutions, which continues to expand and evolve to support your changing needs. From sleek enclosures and user friendly panels to our ultra-high performance modules, adaptor plates, trunks jumpers and more, Siemon users have what they need to successfully deliver new applications and services at speed.

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

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Made to measure

Damian Smart of AFL Hyperscale explains the benefits of using pre-terminated optical fibre cabling solutions in data centre environments and how they can save both time and money, while reducing waste

Pre-terminated cabling solutions, in both copper and optical fibre formats, have been a part of the network infrastructure marketplace for many years. Designed to simplify and speed up the installation process, these solutions come in various formats including pre-terminated cable assemblies, cabinets, racks and modular data centre solutions. The benefits of pre-terminated solutions have been widely discussed and they continue to grow in popularity, especially in the ever-evolving data centre environment.

FIBRE PROVIDER

Traditionally, we have seen lower fibre counts, typically 24, 48 or 96 fibres per assembly, terminated with LC or Base-12 multi-fibre push-on (MPO) connectors and used within the data centre white space to provide connection in top, end and middle of rack environments. These continue to be popular due to their numerous benefits such as faster deployment, improved reliability, scalability, cost efficiencies and standardisation. These benefits not only reduce waste but are more sustainable, while allowing expansion of the infrastructure with minimal disruption in the most time efficient manner.

Nowadays, pre-terminated solutions are being increasingly utilised within the data centre interconnect space (DCI), linking compute space within large campus environments. This facilitates resource sharing and load balancing, allowing for the distribution of workloads and traffic across multiple data centres, and ensuring optimal resource utilisation and scalability as demand fluctuates. This allows them to function as a unified, interconnected system – an integral tool for data centre operators.

GROWING CONCERN

As internet traffic expands and the need for cloud migration escalates, tasks require the exchange of large amounts of data – from hundreds of gigabits to terabits. Handling these growing bandwidth demands requires reliable, high capacity connections that can scale simply, reliably and efficiently. Pre-terminated

solutions fit neatly within this requirement, supporting reliability with factory tested and certified terminations, reducing installation time and minimising material scrappage.

These solutions can be configured with suitable installation aids such as braided sleeves, small diameter pulling grips and appropriate protection against mechanical stress, depending on the environment. As the demands on the infrastructure grow, an increasing number of fibres are required to efficiently support the needs of a data centre campus. This is where pre-terminated solutions have evolved. Ultra-high fibre count MPO based trunk cable assemblies featuring Base-24 MPO connectors terminated to the latest ribbon fibre technology is a prime example.

COUNTING THE COST

The reduction in labour is a significant benefit of any pre-terminated solution, especially ultra-high fibre count solutions, as they are factory terminated and do not require splicing in the field. The advantages here are numerous and include the complete elimination of bad or failed splices at the point of termination and a substantial reduction in labour time for

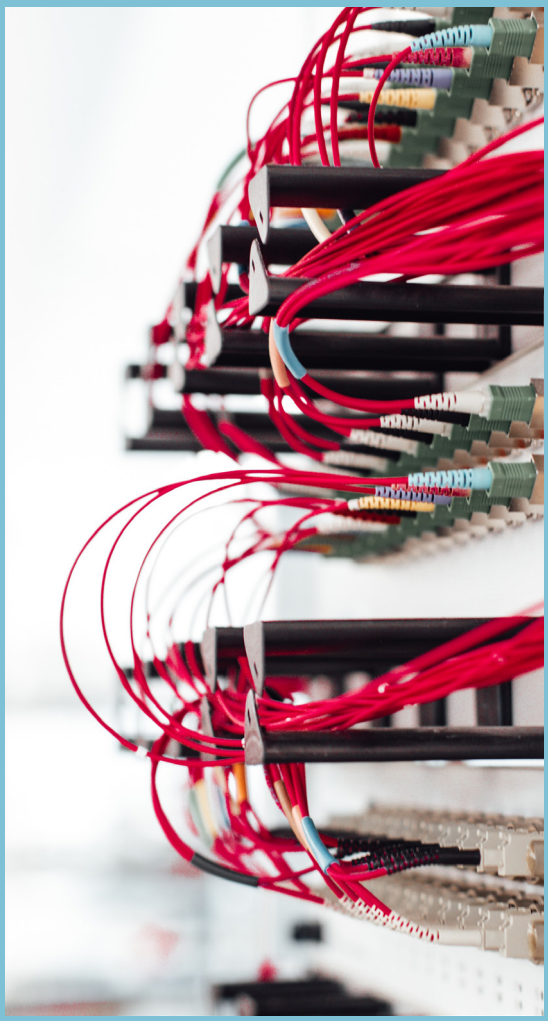
'The performance of a pre-terminated cable assembly is dictated by many factors including the cable design and construction, the furcation method and, of course, the connector termination process.'

ultra-high fibre count assemblies.

The patching frame at either end of the assemblies serves to consolidate and host the incoming fibre connections, presenting them in MPO format within the patch frame. After the termination of the ultra-high fibre count pre-terminated cable assemblies, each connection can then be mated to a high fibre count MPO trunk cable for onward distribution to the required location within the data centre.

QUALITY STREET

With any pre-terminated solution, from small to ultra-high fibre count, it is critical to select a quality product and specify



performance levels. The performance of a pre-terminated cable assembly is dictated by many factors including the cable design and construction, the furcation method and, of course, the connector termination process.

Reputable vendors will use well established and proven processes for the manufacture of their products and will provide clear performance specifications and test results. This performance specification becomes even more critical at ultra-high fibre counts. Given the importance and volume of data flowing over these interconnections, any outage can be extremely expensive and

impactful.

Modular based connectivity solutions, when used in conjunction with pre-terminated trunk cables, also provide longevity for the infrastructure. They allow for configuration changes with minimal disruption by simply adding, moving or changing cassettes. The pre-terminated trunk cable can continue to support further generations of equipment, providing greater bandwidth and lowering the total cost of ownership.

CHOOSE WISELY

When considering a pre-terminated solution for your data centre, it is important to work with reputable vendors and assess your specific needs to choose the right solution. Additionally, planning and design play crucial roles in ensuring success. ■

DAMIAN SMART

Damian Smart is head of solutions engineering at AFL Hyperscale. With a strong foundation in data centre design and network infrastructure, Smart joined the company in 2020 having previously worked for CommScope, Huber+Suhner and TE Connectivity.

nLighten appoints Justin Nesbitt as UK sales director

Proximity Data Centres, the UK division of nLighten, has appointed Justin Nesbitt as UK sales director. Nesbitt will lead the sales team in identifying new opportunities, strengthening current partnerships and reinforcing nLighten's commitment to delivering world class edge data centre solutions.

With over 25 years of working in the data centre and connectivity sectors, Nesbitt brings a wealth of experience and a proven sales track record. Prior to joining the company, he held various senior sales positions at Equinix, where he achieved substantial growth and built enduring relationships with key shareholders.


Justin Nesbitt

'I am excited by the opportunity of joining the company,' said Nesbitt. 'The potential in the edge data centre market is vast and I look forward in contributing my expertise to ensure we remain at the forefront of innovation and service.'

Siemon joins the InfiniBand Trade Association

Siemon has joined the InfiniBand Trade Association (IBTA). Founded in 1999, IBTA is chartered with maintaining and furthering the InfiniBand architecture specification to help enable users across the globe to gain access to higher speed connectivity quickly and more reliably.

Gary Bernstein, Siemon's senior director of global data center sales, stated, 'We are thrilled to announce our membership of IBTA, reinforcing our commitment to advancing network infrastructure solutions globally. We recognise the pivotal role InfiniBand plays in meeting the escalating demands of cutting edge technologies like artificial intelligence and accelerator cards. Siemon is committed to providing innovative cabling and connectivity solutions that enable the advancement and adoption of this technology.'


Gary Bernstein

Siemon has also published its 2023 Environmental, Social and Governance (ESG) Report. This comprehensive report underscores Siemon's dedication to environmental stewardship, social responsibility and robust governance principles. Additionally, it highlights the company's continuous leadership in advancing ESG initiatives within the information communication technology industry.

James Bates joins n2s as its new CEO

n2s has appointed James Bates as chief executive officer (CEO). He brings a wealth of senior management, corporate sales, supply chain and procurement experience from a career spent in industry and electronics distribution. Bates joins n2s from Rapid Electronics, where he was instrumental in transforming the company's procurement supply chains and driving significant sales growth during his seven year tenure as managing director.


James Bates

'I am delighted and highly motivated by the opportunity to lead n2s's onward trajectory as a major player and innovator in IT lifecycle management,' said Bates. 'The business is poised for significant growth over the next three years and has the technical expertise, operational structure, processing capacity and investment in place to support this. Our strong management team is passionate about the huge market opportunity for n2s to be a global gamechanger at the centre of delivering a truly circular and sustainable economy for IT.'

CHANNEL UPDATE IN BRIEF

Kyndryl has formed a strategic global alliance with Palo Alto Networks to provide end to end network and cybersecurity services including the launch of a new service offering, powered by Prisma SD-WAN, for enterprises and Industry 4.0 customers.

Simon Fieldhouse has been appointed chief executive officer at ITM Communications, following Aliter's investment in ITM earlier this year. Fieldhouse will now work closely with the teams at ITM and Aliter to drive growth organically, whilst leading a nationwide buy and build strategy to gain scale and a national footprint.

Mitel has appointed Charles-Henry Duroyon as chief operating officer (COO). Duroyon will oversee Mitel's global business operations, supply chain and data privacy office, as well as lead the company's strategic planning initiatives.

Nokia, BT Group and MediaTek have successfully completed trials of 5G Reduced Capability (RedCap) technology with RedCap devices. The trial, which took place at BT Group's Adastral Park site, utilised Nokia's AirScale RAN portfolio, EE's 5G Standalone (SA) network and MediaTek's RedCap testing platform.

Evolve IP has expanded its account management team across the UK with the appointment of Richard Howson to inspire further partner growth. He is the company's latest partner account manager and will provide dedicated day to day support across a range of key sales activities.

Critical Power Supplies (CPS) has entered a collaborative partnership with Powerstar.

Man on a mission

Committed to improving the environmental credentials of data centres across the world, John Booth is a true sustainability evangelist. Rob Shepherd recently caught up with him to find out more about his life and career, and gets his thoughts on some of the big issues affecting the data centre sector

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

JB: I'm the managing director of Carbon3IT, which is a sustainable ICT consultancy. However, I have many hats.

These range from being chair of the BSI TCT7/3 committee that works on the EN 50600 data centre design, build and operate standards and ISO/IEC 30134 series of data centre key performance metrics such as Power Usage Effectiveness (PUE), Renewable Energy Factor (REF) etc, to the vice chair of the British Computer Society's Green IT Specialist Group and being part of the Sustainability Committee of the Infrastructure Masons. I'm also chair of the Data Centre Alliance's (DCA) Energy Efficiency and Standards Committee and have been part of the EU-JRC team that looks after the European Union Code of Conduct for Data Centres (Energy Efficiency) (EUCOC) since 2012.

Carbon3IT provides, in essence, data centre support services, energy efficiency and sustainability consulting services, and provides insight on current and forthcoming EU legislation for data centres. We offer data centre assessment services for EUCOC, the Certified Energy Efficient Data Centre Award (CEEDA), DCA certification, and third-party assessments to EN 50600. We also provide bespoke training services to client requirements – basically we fill in the gaps from courses provided by conventional training providers.

> 'In terms of design, everything the sector is doing at the moment is just fiddling around the edges – a little bit of hydrotreated vegetable oil (HVO) here, a change to evaporative cooling there, while buying renewable energy etc. It's all just flimflam.'

RS: How and why did you decide to embark on a career in data centres?

JB: Like most people in the sector I sort of fell into it. I started through an apprenticeship back in the early 1980s with British Telecommunications, so got a good background in telecommunications systems, private wires and customer apparatus etc.

I then moved to Grant & Taylor as a junior project manager. I started working on key systems and small cabling projects, moving on to electrical installations doing larger campus type cabling projects such as the renewal of voice cabling at British Steel

in Scunthorpe and Teesside, hospitals and projects in the City of London for trading houses and banks. After that I joined Computacenter and installed desktops/laptops and servers into all sorts of places all over the world.

My road to Damascus moment was visiting the Eden Project in Cornwall in 2003. After spending the day walking around the tropical and semi-arid domes and enjoying the lovely gardens there, we had to leave via the shop. It was full of gardening equipment, books on gardening, seeds etc, and tucked away on a shelf was a printed circuit board. I remember wondering what it was doing there surrounded by all things gardening, so went over for a better look. It turned out to be a board that had failed final quality assurance testing, so rather than dump into landfill they'd removed all the transistors and capacitors, bevelled the edges and put a foam backing on it. It was on sale as a mouse mat.

I remember thinking that's a terrible way for a computer to die and there must be something better we can do. At the time my girlfriend (now wife) and I had been looking at emigrating to Australia, but we were a few points short. One of the ways to accumulate some more points was for me to get a degree. I signed up for a

degree in environmental studies with the Open University, which after few years turned into a technology degree.

I had the opportunity to take early voluntary redundancy from Computacenter and decided to start Carbon3IT. That was in 2010, and here we are 13 years later.

RS: How important are data centre consultants and how has the role changed over the last 10 years?

JB: Data centres are not something an organisation will build every day, so when you have the usual space, power and cooling problems it's a very good idea to retain a consultant to provide the most up to date concepts and thinking. That said, many consultants are firmly wedded to 20th century design principles and thinking, and not many have really got to grips with the actions we will need to take to address the climate emergency. So the role has changed but sadly not the people.

RS: What is the most common question you're asked by your clients?

The most common question at the moment is 'Can you explain the EU data centre legislation coming down the track and when will it jump over the channel to the UK?'. The answers are yes, and sooner rather than later!'

RS: Is the battle for the energy efficient data centre being won and can they ever truly be sustainable?

JB: No, and certainly not in their present form. The sector as a whole, and that includes ICT manufacturers, really needs to undertake a radical rethink of the way data centres are designed, built and operated.

I appreciate that that is somewhat controversial and there are plenty of industry operators who have taken umbrage with my views. However, we simply cannot continue to build data centres to what are essentially the same designs from decades ago with a few tweaks and meet our net zero and climate emergency goals. I'm on record with this – we have to do better.

RS: How is the energy crisis affecting data centre, design build and operation?

JB: Energy crisis, what energy crisis? I don't think it's made any difference to the way we design, build and operate data centres to be perfectly honest, except that some end users may have finally identified and got rid of the zombie servers in their estate that the Uptime Institute spoke about years ago.

In terms of design, everything the sector is doing at the moment is just fiddling around the edges – a little bit of hydrotreated vegetable oil (HVO) here, a change to evaporative cooling there, while buying renewable energy etc. It's all just flimflam. What we need to do is have a sector wide big tent type debate and start with a blank sheet of paper.

> 'Why do we insist on using the ASHRAE recommended range of 18-27°C, when we could use the allowable range of 10-32°C and eliminate mechanical refrigeration and cooling entirely within the data centre space?'

For starters, why are we providing an AC powertrain, with all the expense that entails,

to the back of server, when the power supply in the server transforms 220-240VAC into +/- 12 VDC for use on the motherboard? That transformation generates heat, which we then have to remove. We need to rethink our use of power. On cooling, why do we insist on using the American Society of Heating, Refrigerating and Air Conditioning Engineers' (ASHRAE) recommended range of 18-27°C, when we could use the allowable range of 10-32°C and eliminate mechanical refrigeration and cooling entirely within the data centre space?

'The data centre sector thinks it's going to get a free pass from legislation because of the work we can do in fighting climate change. That notion needs to be crushed. We will not get a free pass – legislation is coming and we had better embrace it.'

Ultimately, it's about risk. We, as an industry, still perceive the risks as those prevalent in the 1960s, which in some cases did not exist or have been largely eliminated.

RS: You're a familiar face at industry conferences and seminars. What motivates you to present at these types of events?

JB: I'm on a mission to change the way the industry operates. The best way to do that is to challenge the sector and its personnel at events and I also want to explain what is coming down the line in terms of legislation. I often think that the data centre sector thinks it's going to get a free pass from legislation because of the work we can do in fighting climate change. That notion needs to be crushed. We will not get a free pass – legislation is coming and we had better embrace it.

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

JB: I really want to break the conservative view of data centre design, build and operation that's been around since the 1960s. Things have changed and we need to change with them. Being rigidly wedded to outdated design principles means we stagnate and we will not address our climate goals or beat the climate emergency.

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

JB: There are two. The first is you have two ears and one mouth – that means you should listen twice as much as you speak. Now, those who know me know that I love a good conversation about many things, not least understanding the thought processes of those that work in the sector. I'm probably guilty of not taking this advice! The other is every day is a learning day – and that I do subscribe to.

Both of these have helped me understand how things connect, how a change in one area can affect another, the identification of policy, process and procedures, and how they all link. You get that by listening and having an open mind. When training I make it clear to students that there is no such as thing as a stupid question and they should feel free to ask whatever they want. ■

Quick clicks

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

The Benefits Of Mixing Copper And Fiber In Data Centers And Intelligent Buildings is a blog by Dave Fredricks of **Siemon.** **CLICK HERE** to read it.

What Is A Wi-Fi Heatmap? **NetAlly** explains outs in a blog.
To read it **CLICK HERE.**

Single Pair Ethernet: Data And Power For The Future is a blog from Mike Berg of **Panduit.** **CLICK HERE** to read it.

Cloud Evolution: Make Innovation A Habit is a report from **HCLTech** based on a survey of 500 senior business and technology leaders across various industries.
CLICK HERE to download a copy.

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The Importance Of Fiber Testing In Modern Data Centers is a blog by Charlie Colias of **AFL Hyperscale.**
CLICK HERE to read it.

Schneider Electric has published an updated version of its Guide To Environmental Sustainability Metrics For Data Centers, which proposes five categories including 23 key metrics for data centre operators.
CLICK HERE to download a copy.

Corporate Sustainability Reporting For Data Centres – Are You Ready? is a free ebook written by Matthew Farnnell of **EkkoSense.**
CLICK HERE to download a copy.

Playing the long gar

As energy costs continue to rise, Louis McGarry of Centiel explains the need for manufacturers to develop more efficient uninterruptible power supply (UPS) solutions

According to the Department for Business, Energy & Industrial Strategy there was a 260 per cent increase in electricity prices between 2004-2021. However, more recently, we have seen even more dramatic increases. With the potential for power costs continuing to rise, we face a very real problem. This, combined with society's ever increasing demands for electricity, means that data centres need to consider efficient operating strategies like never before.

THINK AHEAD

Organisations need to recognise that the only way to reduce energy consumption is to take a long-term view. Previously, capital expenditure (CapEx) considerations would greatly influence decision making when it came to purchasing new equipment in the data centre.

However, we are experiencing a paradigm shift, where suddenly the operational expenditure (OpEx) of a wrong decision now far outweighs the small sum saved on buying a slightly less expensive but vastly less efficient UPS system. Total cost of ownership (TCO) calculations need to be made over 10, 15 and ideally 30 years – the whole lifecycle of the data centre – to make informed choices about facility design and the right choice of UPS and associated equipment.

RIGHT ON

Oversized UPS are inefficient. Modular UPS are flexible and can be installed with the ability to add modules using a pay as you grow approach. Only the relatively inexpensive infrastructure around the UPS needs to be ready for future growth, so the

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facility should be designed with flexibility for the future in mind. Then, rightsizing the UPS from day one minimises overall CapEx and OpEx.

If a UPS is not rightsized and not working at full capacity – in other words at low loads – it means it is not operating at an optimal point in its efficiency curve.

Rightsizing is also relevant to the data centre components of an installation. In order to rightsize batteries, the shutdown procedure needs to be understood. If there is a power cut, how long does it take to shut down the critical load safely? Is a three hour runtime really needed? For example, hospitals adhere to health technical

Therefore, calculate the rating of the UPS system based on the actual power of the load measured in KW on day one – don't oversize systems and ensure the UPS will remain efficient if the load tails off.

memorandum (HTM) compliance of one hour autonomy. Organisations that have an on-site, auto-start generator may only need 10 minutes of autonomy. Reducing batteries sizes will, again, minimise CapEx

'As an industry that burns significant amounts of power, we have a responsibility to choose a more sustainable way forward. Let's not keep doing what we've always done and work together to map out ways to become more efficient and sustainable.'

and OpEx, while also reducing the amount of cooling needed to keep valve regulated lead acid (VRLA) batteries at their optimum working temperature of <20°C.

GO TO SLEEP

Critical loads can vary for many reasons. A business could see high demand during the day but low demand in the evening when its offices are closed. In colocation data centres, clients can come and go. This makes the rightsizing of the UPS a challenge.

One way to address the challenge of oversized UPS, or in a situation where the load can vary, is the ability to place excess UPS modules into a sleep mode. The great thing about sleep mode is that although the UPS modules sleeping have all their monitoring circuitry fully operational, they are not switching power. With their monitoring circuitry fully operational they are instantaneously ready to switch power if they are ever needed and, because it is the switching of power that causes the greatest energy losses, system efficiency is significantly increased.

For example, if five UPS modules share a load equally at 20 per cent each, it is inefficient and wastes energy and money. If three modules were put into sleep mode, the load on the two remaining UPS modules would be equally shared at 50 per cent each. The UPS system would then have N+1 redundancy and the whole system would operate at a much higher point on its efficiency curve.

PEAK PERFORMANCE

There are different terms for peak shaving including peak lopping, load shaving or peak load shaving. This is a way that facilities can use their own energy storage to save costs during peak times of demand on the National Grid. For peak shaving to work successfully, the necessary technology must be included in the UPS, so product selection from the outset needs to be considered carefully. The type of UPS battery used is also

very important.

Lithium-ion batteries, unlike traditional VRLA batteries, are capable of thousands of cycles but they have legitimate safety concerns. They release oxygen, which is combustible and, if they do catch fire, the fire is not easily put out. Lithium iron phosphate (LiFePO4) batteries, however, are oxygen free and are as safe as VRLA batteries. They share the advantages of cycling but with significantly less risk. They also tolerate higher ambient temperatures, reducing or removing the need for cooling, and their typical useful working life of 15-20 years means they only need to be replaced once in a 30 year design life.

By using LiFePO4 batteries it is possible to reduce costs by taking some energy from the batteries, instead of the National Grid, during peak times in the day, for example, and recharging batteries at times of lower demand when electricity costs are less, such as at night. It would not make sense to discharge batteries completely or quickly, so to preserve battery life small amounts of battery energy are taken simultaneously with grid sharing to shave pence off the bill, which over time adds up to significant savings.

One real life example is a distillery in Scotland that plans to work off-grid completely. A combined heat and power (CHP) generator, running off gas, will provide power. However, in times of peak demand the factory can peak shave using the energy stored in its UPS batteries rather than purchasing electricity from the UK power network.

LOOK DOWN THE ROAD

Despite receiving hundreds of enquiries about LiFePO4 batteries because of their numerous operational benefits, short-term thinking means that the overwhelming majority of orders placed are for traditional VRLA batteries. As an industry that burns significant amounts of power, we have a responsibility to choose a more sustainable way forward. Let's not keep doing what we've always done and work together to map out ways to become more efficient and sustainable, tailored to the needs of individual facilities. Increased energy costs will force action but let's tackle this challenge intelligently, together, and start to pay it forward now for the benefit of future generations. ■

LOUIS MCGARRY

Louis McGarry is sales and marketing director at Centiel UK. His experience in the UPS industry spans many years, with an extensive knowledge of products that enables him to successfully design and deliver solutions for the critical power market. McGarry joined the Centiel team early in 2018 to assist in delivering the company's technology to the critical power market and build the Centiel brand.

Comtec is now Netceed

As the need for resilience ever increases in both the data centre and enterprise spaces, it is more important than ever before to consider investing in technologies to keep your infrastructure functioning in the event of a problem.

Comtec is now Netceed highly recommends UPS products from our partner brand, Salicru, which offers a wide range of UPS devices for every application and at a price that is less shocking to your pocket than traditional brands. Used in combination with lockable power leads from IEC-Lock ensures that anyone working in the cabinet doesn't accidentally disconnect your network. We can offer the back-up you need in your racks to prepare for anything.

CLICK HERE for more information about Salicru and **CLICK HERE** for IEC-Lock. Alternatively, **CLICK HERE** to send an email or call us on 01480 415000 to speak to our highly trained advisors.

www.comtecdirect.co.uk

Austin Hughes

Unlike traditional rack power strips that are mounted inside server rack enclosures, the Austin Hughes MiniBoot's smaller form factor brings innovativeness in power distribution outside the rack. The MiniBoot web power reboot and monitoring device offers a cost efficient power solution for any environment with electronic devices or systems.

Users can try to recover a crashed device by remote reboot, reducing the need to send engineers to site. This means less personnel and travel costs by negating the need for staff to be at the equipment location – therefore improving uptime and productivity. Alerts can also be received via SNMP, email (SMTP) and syslog when predefined thresholds are exceeded for both MiniBoot and environmental sensor events.

The MiniBoot is designed to meet the needs of a variety of industries in a diverse array of environments. These include transportation (air, land and sea), broadcasting, entertainment, advertising, manufacturing, mining, satellite, defence, education, telecommunication, and finance and banking.

To find out more **CLICK HERE.**

www.austin-hughes.com

Excel Networking Solutions

The Excel Intelligent PDU (iPDU) family from Excel Networking Solutions offers a high specification portfolio of power distribution units that are designed to suit any environment where monitoring or managing of information is required.

The iPDUs are a highly flexible solution, with all versions having a built-in RGB display environmental centre covering a series of functions for optimum analysis of power consumption and distribution. This is even down to individual socket monitoring and switching, enabling billing quality accuracy to better than one per cent, allowing the unit to be used in colocation centres for the monitoring and charging of power used.

The products in the range have been developed so that they can work as individual masters or run as a master and slave system, with provision for up to 31 slaves from just one IP address. These PDUs can also monitor temperature and humidity, as well as providing an option to enhance cabinet security by allowing remote access to lock and unlock the doors.

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

Panduit

Panduit's SmartZone UPS range is a highly versatile customer focused 1/2/3kVA lithium-ion and valve regulated lead acid (VRLA) 5/6/10kVA and 10/15/20kVA solution, offered in single and three phase configurations.

Being prepared for power interruptions can be the difference between business continuity and chaos, and a UPS ensures successful operational continuity. However, the time between utility power failure and the IT load transitioning to the UPS is critical – and milliseconds count. Power interruption longer than 20ms will probably result in an IT systems crash.

The SmartZone UPS range provides intelligent network management, environmental and security sensors, and the ability to connect to additional external battery packs to scale the failsafe capability. UPS solutions must be suitable for the IT load they are supporting and a primary concern is the IT equipment running critical loads. For higher speed processors generating more heat at the server, UPS for cooling systems is fast becoming critical.

Compared to VRLA, lithium-ion batteries offer longer lifecycles, reduced weight, compact footprint and lower cooling requirements. Lithium-ion's potential is also key in small data centres and edge environments.

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

Mayflex

The entire Uniti Power Symphony UPS range is now available to purchase through Mayflex. Recognised globally, Uniti Power is synonymous with high quality UPS solutions, offering online double conversion UPS ranging from 1.5kVA-10kVA, all delivering advanced technology and superior engineering.

Customers leveraging the Uniti Power UPS monitoring service gain access to an exclusive six year warranty, ensuring comprehensive protection and peace of mind during power disruptions. This commitment to reliability and customer satisfaction is a cornerstone of the Uniti Power brand.

Uniti Power's comprehensive selection of products is complemented by exceptional technical knowledge, ensuring a seamless experience from start to finish. The company's unwavering commitment delivers unparalleled support, helping you navigate through its product range and offering expert advice precisely when you need it.

To learn more about Uniti Power UPS, **CLICK HERE** to email the Mayflex sales team or call 0800 757565.
www.mayflex.com

Schneider Electric

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

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

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

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

Smooth operator

Martin Ryder of Vertiv explains why an uninterruptible power supply (UPS) is an essential component of any power management strategy at the edge

Edge computing is experiencing a rise in popularity, with Statista predicting that the worldwide edge computing market will reach $274bn by 2025. As the volume of data generated by connected devices continues to grow, fuelled by advancements in technology such as 5G, the internet of things (IoT) and artificial intelligence (AI), organisations are recognising the potential of edge capabilities to meet network demand, enable digital product and service delivery, and provide enhanced user experiences.

BENEFIT CHECK

Edge computing promises to benefit a wide range of industries. From cloud gaming and smart grids to autonomous robots in industrial settings – they all have something to gain from processing data closer to the end device and leveraging the latest technologies to accelerate their digital transformation journey.

If organisations want to set-up localised IT resources, they may be thinking of deploying multiple IT footprints in remote locations as part of an edge network. A financial services or retail company might want to set up IT deployments at branch offices or store locations; education or healthcare establishments might want to deploy IT footprints on multiple college or hospital campuses over a wide geographic area; and industrial companies might want to establish edge computing infrastructure at several manufacturing facilities. Whatever the industry, the facilities for hosting localised IT footprints could be small data centres, server rooms or network closets.

USER EXPERIENCE

Edge infrastructure can be placed within an enterprise's premises, whilst being managed or hosted by service providers. Other benefits include high bandwidth, device processing and data offload, as well as trusted computing and storage.

It provides remote users with a better experience, reducing latency with business applications such as video conferencing, and allows information flow to be viewed in real time, which can bring competitive advantage. It also facilitates automation and maintains data locally, providing data sovereignty and enhancing security and regulatory compliance.

MEETING THE CHALLENGE

Although there is no doubt that edge computing enables enterprises to unlock new sources of value and become the backbone of digitalisation, the fast growth in edge computing is challenging data centre and IT teams' ability to manage local power operations effectively. Despite the criticality of edge sites to the customer experience, the reality is that these sites can have significant outages.

With downtime costing businesses

greatly in both monetary and reputational terms, enterprises are looking for efficient solutions to protect small and micro IT sites against power outages. Therefore, it is crucial for enterprises to have a reliable power supply to keep operations running smoothly. UPS systems typically provide emergency power for a short time (5- 10 minutes) – enough to safely shut down workstations and servers until the grid is back online or until additional generators kick in – in cases when there are unexpected disruptions, such as mains power failure.

Edge deployments often rely on a single phase or small three phase UPS, which includes a reliable stored energy source such as a battery system to power the IT infrastructure. Back-up battery systems for edge of network installations need to operate correctly at the crucial moment when the UPS must deliver back-up power to the load. If a power outage occurs, the batteries will be needed to provide back-up power to allow adequate time for the utility to be restored. It also means IT administrators can migrate virtual IT environments to stable sites, or enable operations systems to conduct an automatic controlled power shutdown of connected equipment.

WHAT'S IN STORE?

Over the past five years, lithium-ion batteries have become a more popular choice as a stored energy source supporting single phase UPS systems in remote mission critical environments and edge data centres. This is because they address the main drawbacks of

‘For companies wishing to deploy distributed computing and edge networks, lithium-ion batteries are ideal for use with IT deployments in remote locations.’

traditional valve regulated lead acid (VRLA) batteries, which are more traditionally used for UPS systems.

Well known for powering laptops and mobile phones, lithium-ion batteries are now changing the IT industry. For companies wishing to deploy distributed computing and edge networks, lithium-ion batteries are ideal for use with IT deployments in remote locations. They offer more reliable performance, require less maintenance and are more compact and lightweight. This translates into a remarkable power density level, where less space is needed to deliver the same amount of power than VRLA batteries.

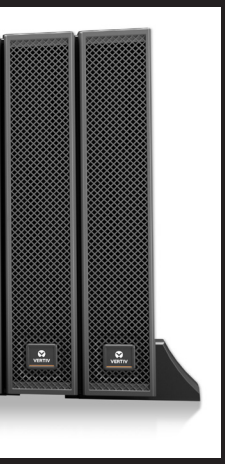
TAKING THE ADVANTAGE

There are many benefits to using lithium-ion batteries. They offer a longer lifespan – typically 10-12 years, which is roughly the lifespan of a single phase UPS itself, in comparison to about 3-5 years for VRLA batteries. They also perform better at higher temperatures and require reduced maintenance with fewer battery replacements. Lithium-ion batteries are also significantly more compact and lighter, weighing 40 to 60 per cent less and having a 40 per cent smaller footprint than their VRLA counterparts.

As they have a wide operating temperature range, they are applicable for more extreme, non-traditional settings and facilities that don’t have sufficient cooling capabilities, making them more suitable for edge computing. Moreover, lithium-ion batteries come with an advanced integrated battery management system (BMS). This provides an accurate picture of the battery’s health and runtime, and protects the battery cells against current, temperature and overcharging

or undercharging. The BMS continuously adjusts battery charging to get the most out of performance and battery life.

Lithium-ion batteries are also suitable for many applications where frequent charge and discharge cycles are expected. While VRLA batteries can take over six hours to charge from 0-90 per cent of full runtime capacity, lithium-ion batteries can take as little as two hours to recharge. That reduces the overall risk of experiencing an outage before UPS batteries have been fully charged. These inherent benefits give lithium-ion users a total cost of ownership (TCO) that is up to 50 per cent lower than a similar UPS using VRLA batteries during the typical life of the UPS.



FUTURE DEVELOPMENTS

As for the future, hydrogen fuel cell technology offers potential for back-up power applications, as well as off-grid or primary power that is reliable and sustainable for combined heat and power applications, grid and micro-grid support. Promisingly, there's plenty of research being undertaken in order to make these ambitions a reality.

Vertiv, Equinix, InfraPrime, RISE, Snam, SOLIDpower and TEC4FUELS have come together to form a consortium, called EcoEdge PrimePower (E2P2), to explore an innovative integration of solid-oxide fuel cells with UPS technology and lithium-ion batteries. The goal of the E2P2 project is to provide resilient and clean primary power to data centre deployments and other critical infrastructure.

PRIME MOVER

Implementing natural gas solid oxide fuel cells (SOFC) as a prime power application will be instrumental in paving the way for the use of green hydrogen for fuel cell application in both back-up and prime power systems. Hydrogen is a challenging substance to work with, but with increasing technology development and expansion of hydrogen supply chain and logistics, it could be the future for many businesses. ■

MARTIN RYDER

As channel sales director for Northern Europe at Vertiv, Martin Ryder helps organisations to power their mission critical applications. He leads the channel team leveraging Vertiv's portfolio of products including brands such as Liebert, Geist and Avocent.

Centiel supports Sure's data centres on net zero path

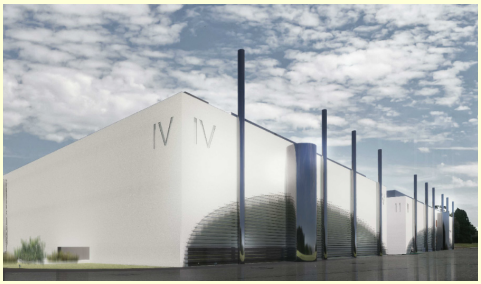
Centiel has completed a project to deploy its CumulusPower uninterruptible power supplies (UPS) in three of Sure's Tier III Guernsey data centres. Sure's data centres on the Channel Islands keep some of Europe's largest organisations' critical data safe and secure in a location outside of mainland UK and Europe.

Sure requires the highest level of uptime and is also committed to reducing energy usage throughout its facilities. CumulusPower was selected to replace a number of legacy UPS, providing a more efficient solution now that Sure is on a zero carbon path.

CumulusPower offers significantly higher resilience and availability that the previous legacy equipment, in addition to achieving significant energy savings, costs and reducing carbon footprint. Due to the true modular nature of CumulusPower, it is highly efficient – meaning it runs at 97 per cent efficiency compared with <80 per cent for the previous UPS. Centiel has also trained Sure's engineers in first level response and they can now complete basic monitoring, diagnostics and maintenance of the UPS.

Telehouse Europe opens new TH3 Paris Magny Campus

Telehouse Europe has opened its TH3 Paris Magny Campus. With its environmentally responsible design, high level security and a 12,000m² IT surface, the data centre operates at a total electrical power of 18MW. It has the highest possible standard of resilience, with 99.999 per cent service availability.



Some 30 minutes from central Paris on a former military site, the data centre is strategically located to accommodate extended IT infrastructure for companies. It is also situated outside the concentration zone for data centres in north-eastern Paris – a key factor for geographical redundancy, enhancing security for the IT infrastructures it hosts and thus ensuring continuity of service for companies.

This new site also stands out for its low environmental impact, with its eco-responsible construction. The best available cooling technology, such as free chilling built into its air condenser refrigeration units, minimises water use and reduces electricity consumption. The Water Usage Effectiveness (WUE) rating of the new data centre is close to zero.

Secure IT Environments designs and installs fire suppression for seven new rooms at Poole Hospital

Secure IT Environments has completed a project for Poole Hospital to provide seven switch and data centre rooms serving operating theatres with fire suppression, protecting a total room volume of 840m³. The project has been part of Poole Hospital's wider new build programme.

The reliance on technology in modern hospitals means that every comms room, data centre and cabinet

needs to be protected by fire suppression. Many of these rooms do not have staff in regularly, making it all the more important that any fire risk is properly controlled. The Novec fire suppression system, which was designed and installed by Secure IT Environments, includes IG55 gas cylinders, combined fire extract and pressure relief vents, detectors, voice sounders, control panels, remote panels, back-up batteries, manual extinguisher release and extinguishant hold off buttons.

PROJECTS & CONTRACTS IN BRIEF

Host-IT has opened two new data centres in Bristol and Nottingham, bringing the total to four in the UK. This number is expected to grow during the rest of 2023 and 2024.

n2s has been selected as a supplier on Crown Commercial Service's (CCCS) Technology Products & Associated Services 2 (TePAS 2) framework.

Zayo Group's future ready network in Europe is now fully 400Gb/s enabled, providing enhanced capacity and scalability for businesses across the globe.

NexGen Cloud plans to invest $1bn to build its AI Supercloud in Europe, with $576m already committed in hardware orders with suppliers. The AI Supercloud will provide a dedicated compute intensive platform for Europe's technology companies, organisations and governments.

CMC Networks has been selected by Webber Wentzel to upgrade its network infrastructure across South Africa. Webber Wentzel is one of the largest law firms in South Africa and CMC Networks designed an end to end network solution to boost efficiencies and further enhance data security.

Saft has delivered a battery energy storage system to replace diesel back-up power generators at Microsoft's sustainable data centre in Sweden. The system entered operation in June 2023 as a key milestone on Microsoft's path to diesel free data centres by 2030.

All you need to know

CLICK ON THE COVER TO VIEW THE 2024 MEDIA KIT

Food for thought

Is your data centre a 'carbonivore'? asks Mark Jow of Gigamon

Sustainability has become a boardroom priority for modern organisations. Alongside the pressure of the ongoing climate crisis, there are good business reasons for this to be a focus. According to IBM, 68 per cent of prospective employees are more likely to apply for, and accept positions from, environmentally sustainable companies, while businesses making environmental, social and governance (ESG) related claims see higher growth than their competitors. However, when paired with ambitious digital transformation strategies, IT and security leaders are left with the challenging brief of building a secure, innovative IT infrastructure, whilst limiting carbon emissions.

DATA CENTRE DILEMMA

Businesses generate a near exponential amount of data, with data centres facilitating the storage and near endless flow of this information between servers, tools, virtual machines and applications, while consuming vast amounts of energy in the process. In fact, data centres account for around two per cent of all global carbon emissions each year, boasting a carbon footprint larger than the airline industry.

These 'carbonivores' not only contribute

huge amounts of carbon emissions to an organisation's overall footprint, the electricity needed to run them leads to hidden costs and operational challenges. Dublin is a prime example of this struggle. Its fast growing data centre industry gobbled up 18 per cent of Ireland's total electricity use in 2022, matching the energy consumption of all urban homes during the same period. This energy consumption has led to national concerns and the government has pushed trade associations and data centre operators to commit to the creation of a new data centre efficiency metric and flexible energy consumption.

Research across European data centre operators has shown a shared struggle to secure reliable power at good prices and UK operators have reported concerns around the cost of energy in maintaining their servers. Reducing energy consumption, and therefore making cost savings, is a no-brainer – but how can businesses place their data centres on a carbon diet?

REDUCING CONSUMPTION

Energy consumption is not a new challenge for the data centre industry. Many system and silicon vendors have introduced more energy efficient hardware in recent years, offering servers and storage devices with lower power consumption. Data centre cooling has also been a source of innovation, optimised through tactics such as free cooling, hot aisle/cold aisle containment, and even constructing new hubs in colder climates for natural cooling effects. But businesses themselves can limit the consumption of their data centres by reconsidering their network management strategies.

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All data centres use various security and monitoring tools to capture data communications through network traffic, each with hidden costs and carbon outputs of their own. One of the popular network analytics probes used across service providers and enterprises requires up to 586W of power to process 16Gb/s of network traffic. Monitoring

100Gb/s of traffic would therefore require seven individual probes, consuming the equivalent of roughly 100 home refrigerators in just one year (35,934kWh).

Some of this traffic processing is not necessary. Streamlining this patchwork of separate tools, by determining what traffic

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is processed by which tools to reduce data duplication, allows data centres to run at a much greater data efficiency, cutting energy costs and reducing carbon output.

LINE OF SIGHT

Gaining true visibility into the network can guide businesses in making the right decisions to streamline their data flows.

There are four key tactics to optimise usage and eradicate redundant or replicated data packets. When combined, they go a long way towards reducing irrelevant network traffic, in turn, cutting energy consumption and building a more sustainable infrastructure.

• Deduplication

The structure of modern data centre networks prioritises resiliency and availability but this approach creates duplicate network packets across a network – dramatically increasing the volume of traffic being processed by data centre tools. Each network packet only needs to be analysed once and deduplication allows operators to identify and remove duplicates before sending network data to tools, reducing redundancies and thereby requiring far less energy.

• Application filtering

Application filtering separates data based on traffic signature, distinguishing between high and low risk applications, even when data is encrypted. High volume, trusted applications such as YouTube can be filtered out, allowing businesses to focus data centre tools where they are needed. This reduces the amount of data flowing across the network and limits the energy use of data centre tools.

• Flow mapping

The process of sending only the relevant network data to meet each tool's needs, flow mapping drastically reduces network traffic and prevents tools from becoming overloaded with information from unnecessary subnets, protocols or virtual LANs.

• Flow slicing

This method of optimisation focuses on reducing the information shared via network packets in every user session. Much like flow mapping, flow slicing functions on the basis that inundating tools with non-essential information wastes valuable energy and many tools

only need to see the initial set-up, header and handshake information. Flow slicing is highly efficient and can carry a big impact on tool traffic and, ultimately, energy consumption – real world deployments reduce tool traffic by 80-95 per cent.

TRUE EFFICIENCY

Efficiency in spending, man hours and energy usage has been the name of the game for IT and security leaders, who are constantly tasked to do more with less. Many cloud journeys began, or were escalated, in response to the Covid-19 pandemic. As a result, inefficiency in infrastructure is something that all modern businesses are now contending with, and a focus on carbon emissions is just the latest pressure for businesses to reduce these redundancies.

These tactics do more than reduce the energy requirements of data centres. By streamlining data tooling, they can enable organisations to remove unnecessary data centre tools and reduce sprawl, saving valuable IT spend for more innovation.

KEEP IN MIND

The old sustainability mantra – reduce, reuse, recycle – reminds us that the first and best way to save resources is to not use them in the first place. Deep observability and better data management empowers enterprises to do just this. By applying a more strategic, considered approach, decision makers can benefit their businesses' budgets, network uptime and even the planet. ■

MARK JOW

Mark Jow is EMEA chief technology officer at Gigamon and aims to help organisations leverage deep observability to optimise hybrid cloud performance. Jow has over 30 years of experience in the industry, having held senior technical leadership positions in Oracle, EMC, Veritas and Commvault.

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