Inside_Networks

A questio of time

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Going the extra mile

HOW TO DETERMINE IF NETWORK CABLING IS MULTIGIGABIT COMPLIANT

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APR
21

Room for improvement

INTELLIGENT BUILDINGS AND THE FUTURE OF THE WORKPLACE

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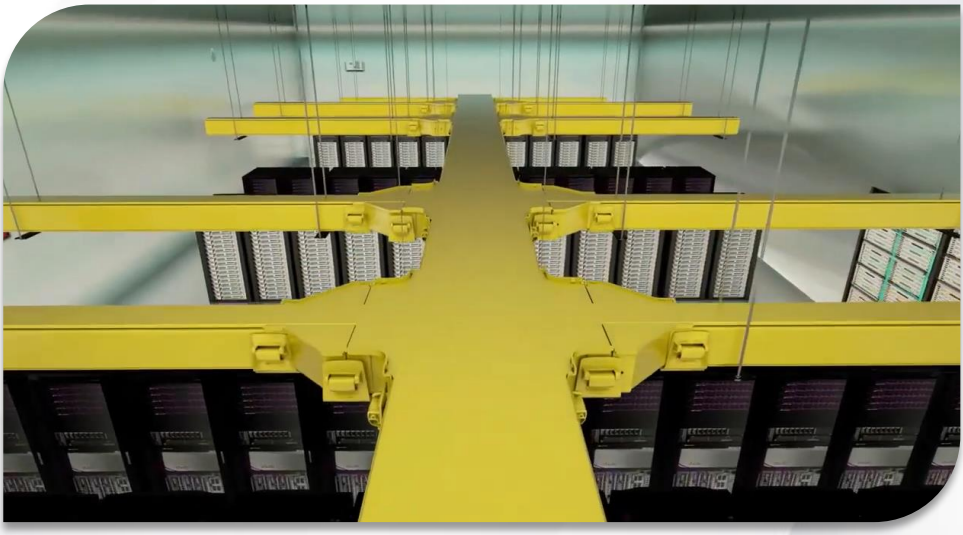
True Innovation in Data Centre Fibre Routing



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The content of the NCI® Apprenticeship has been carefully planned and provides the Apprentice and employer with a full itinerary of activities to follow and implement.

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Under pressure

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Given the increasing reliance we have on the internet for all aspects of our personal and working lives, it's no surprise that data centres have become significant consumers of energy. Let's face it, you can't have one without the other but with the sector under the spotlight more than ever before, it's experiencing growing – and louder – calls to step up to the challenge of lowering its carbon emissions.

Last year the European Union's (EU) Green Deal stated that data centres 'can and should be carbon neutral by 2030'. It claimed that greater use of efficient cooling systems, heat reuse, renewable energy and the construction of facilities in regions with a cold climate are ways that this could be achieved. It's certainly an bold target and one that is being taken seriously by a number of 'big guns', who have signed-up to the Climate Neutral Data Centre Pact (CNDCP) – a self-regulatory initiative that aims to make the EU Green Deal's ambitious goal a reality.

To see whether a carbon neutral data centre sector is a realistic proposition, this month's Question Time tackles the subject head-on. A specially selected panel of experts offer their views about whether this is anything more than wishful thinking and if the data centre sector is guilty of simply paying lip service to the issue.

Also in this issue we have a feature on testing and test equipment, with excellent articles from Robert Luijten of Fluke Networks and Dan Barrera of Ideal Networks – the former covering how to certify fibre using an optical loss test set (OLTS) and the latter looking at how to determine whether cabling is multigigabit compliant. They are joined in our second feature on intelligent buildings by Mike Holmes of Nexans, who looks at the role cabling infrastructure plays and what to consider when specifying it, and Mike Hook of LMG, who explains why modern buildings must be connected, intelligent and deliver real value.

I hope you enjoy this issue of Inside_Networks. Don't forget that if you'd like to comment on any of these subjects, or anything else to do with enterprise and data centre network infrastructures, I'd be delighted to hear from you.

Rob Shepherd
Editor

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Edge computing set to see rapid deployment over the next decade

89 per cent of UK IT decision makers say that edge computing will be important to their businesses over the next 10 years, according to research commissioned by Telehouse International Corporation of Europe. This is despite only 26 per cent currently deploying edge computing.

Mark Pestridge

The research – Vision 2030 – surveyed 250 individuals, with three quarters of those questioned expecting the volume of data they manage to at least double over the next 10 years. 62 per cent say investment in data centre infrastructure will increase and 51 per cent plan to migrate applications to a hosted private or public cloud platform. 24 per cent expect to be deploying on-premise infrastructure, with the average amount of infrastructure on-premise to fall from 54 per cent today to 32 per cent.

Organisations also expect a host of infrastructure challenges including maintaining security and compliance (36 per cent), reducing the environmental impact of IT infrastructure (30 per cent) and selecting cost effective cloud solutions (27 per cent). Cloud also topped the list of focus areas for the next 10 years, cited by 44 per cent of IT decision makers, followed by cybersecurity (40 per cent) and 5G (29 per cent).

Mark Pestridge, senior customer experience director at Telehouse, said, 'It's now more important than ever for businesses to store, access and analyse exponential levels of data at record speeds. Technologies like edge and cloud are critical in enabling this. Ultimately, the key to success for organisations is in building the right infrastructure foundations and connectivity, so choosing the right partner will be critical.'

The coronavirus pandemic has also had a big impact on infrastructure strategy, with 91 per cent planning to make changes to their IT infrastructures. One in four say they will increase bandwidth/connectivity, 38 per cent say they will accelerate and shift more workloads to the cloud, while 34 per cent will increase capacity in the data centre.

Sue Daley, associate director technology and innovation at techUK, commented, 'As organisations begin to rebuild, recover and reinvent themselves, current digital and more transformative technologies are going to be key enablers for what comes next. The research indicates it is not the adoption of one single technology that will hold the key – the convergence of several technologies will become increasingly important to businesses as they look for innovative and greener ways of working.'

The need to reduce environmental footprint was clear in the research and is expected to be the second biggest challenge by 2030. 86 per cent say sustainability is important in their IT infrastructure decision making process, yet almost a third (32 per cent) say they don't currently monitor the environmental footprint of their IT operations.

Data centre cooling energy consumption could be cut by 30 per cent

Research by EkkoSense suggests that operators are missing out on proven ways of cutting cooling energy consumption by up to 30 per cent. The analysis assessed cooling performance across 133 data centre halls, with analysis of over 33,000 IT racks. The results showed that the current average data centre cooling utilisation level is only 40 per cent.


Mark Acton

It also identified that implementing an effective thermal optimisation programme has collectively secured a cumulative 10MW+ cooling power saving – equivalent to a minimum $10m cooling energy cost saving since deployment. This level of performance optimisation applied to the broader global estate of 22,474 midsize, enterprise and larger hyperscale data centres suggests that potential worldwide cooling energy savings of over $1.7bn are realisable.

'With data centres already established as one of the world's highest collective consumers of energy, it's imperative that IT operations teams do everything they can to deliver the quick carbon reduction wins that will help organisations to deliver on their net zero commitments,' commented Mark Acton, EkkoSense's non-executive director. 'This research shows that it's now possible to secure cooling energy consumption reductions of around a third simply by following current thermal optimisation best practices.'

Legrand acquires the Champion One family of brands

Legrand has acquired from A&M Capital Opportunities the Champion One (C1) family of brands. It marks the latest move by Legrand to support data centre and mission critical IT's ever growing need for reliable, highly available and scalable power and connectivity solutions.


John Selldorff

The C1 brands, which include Champion One, Approved Networks and US Critical, will join AFCO, Electrorack, Ortronics, Raritan, Server Technology and Starline in Legrand North and Central America's Data, Power and Control (DPC) division.

'The C1 family of brands complements Legrand's previous acquisitions to provide strong world class engineering talent for unrivalled, customised IT infrastructure solutions,' said John Selldorff, president and CEO at Legrand North and Central America. 'In addition, the acquisition expands our extensive mission critical customer footprint and our reach in emerging tech, 5G and content delivery markets. We look forward to offering customers and partners our new enhanced solutions.'

Colt DCS' European operations go 100 per cent green

Colt Data Centre Services (DCS) has announced that its operations across the UK and Europe are now fully powered by 100 per cent renewable power. Colt DCS has also committed to providing green power to its sister company, Colt Technology Services, and its customers using Colt DCS data centres in the region, in an effort to help them also reduce their own carbon emissions.

These pledges align with Colt DCS and Colt Technology Services' joint commitment to becoming market leaders in sustainability, as both companies begin their transitions to support a zero carbon economy. The data centre provider has also committed to setting ambitious, science based emission reduction targets, which will be finalised in 2021.


Scott Balloch

Colt DCS' director of energy and sustainability, Scott Balloch, said, 'Our accelerated transition to renewable energy is just the first step in our journey to becoming more sustainable as a business and industry, with much more to come. We believe the responsibility lies with us as an industry to lead the way, generate our own high standards for sustainability and present these to governments.'

Renewed focus on digitisation and customer experience is fuelling cautious optimism

BT and Cisco have published new research, with 96 per cent of respondents citing that customers are now taking a more strategic approach to digital investments. 91 per cent of respondents believe businesses are prioritising digital transformation plans for the foreseeable future.

The research reveals levels of optimism in the year ahead despite the current climate, with businesses continuing to adapt in response to evolving circumstances. This cautious optimism is leading to a greater emphasis being placed on the role of technology in underpinning resiliency, continuity and future competitiveness and growth. The survey of senior decision makers across 100 separate channel organisations shows that the biggest opportunities are perceived to be in helping businesses increase agility and flexibility, enhance the customer experience and drive efficiencies.


Chintan Patel

Chintan Patel, CTO at Cisco UK, said, 'It's clear that channel partners and their customers are looking to transform their emergency digital responses for the long-term. Channel partners highlighted cost savings through automation, enhanced agility, flexibility and increased security as key strategic benefits.'

40 per cent increase in edge deployment of network resource forecast by 2022

A 40 per cent increase in edge deployment of network resource is forecast to occur by 2022, according to new research from IDC and Limelight Networks. The Outlook for Edge Services report claims that, by next year, 60 per cent of all network resources will be deployed at remote edge or service provider locations, allowing business leaders to leverage the agility of their network resources – up from 20 per cent in 2020.


Steve Miller-Jones

The report also explores the benefits that industry professionals expect the edge to add to their businesses. 45 per cent believe it will bring increased productivity or efficiency, while 44 per cent think it will offer increased security and compliance. Furthermore, 40 per cent believe edge will provide improved customer relations or customer experience.

Steve Miller-Jones, vice president of strategy, industry and partnership at Limelight Networks, commented, 'In the last few years we have seen advances in both the range of edge services and their adoption within a variety of content and enterprise workflows. In 2021, we can expect the scope of customisation capabilities to grow, helping enterprises meet high end user expectations for accessing and consuming content.'

NEWS IN BRIEF

A study by Juniper Research has found that smart traffic management systems will save cities $277bn by reducing emissions and congestion globally by 2025.

Siemens UK has been awarded the Cyber Essentials Plus (CE+) certification – a prerequisite for organisations applying for critical national infrastructure (CNI) and defence projects.

Frost & Sullivan has presented Eurotech with the 2020 Global Competitive Strategy Leadership Award for its focus on IT/OT integration. By bridging the gap between IT and OT, Eurotech has developed products that adopt open source and open standards to 'uncomplicate' internet of things (IoT) deployments.

DatacentreSpeak has launched a new service offering to aid medium sized companies to identify and prioritise digitalisation opportunities and develop an effective strategy for program delivery.

Colt Data Centre Services' (DCS) Inzai 1 data centre has been awarded the Stamp of Approval for Management & Operations (M&O) by Uptime Institute Professional Services. This is awarded to data centres that take the necessary measures to achieve the maximum uptime of their existing data centres.

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Attention to detail

Hi Rob

There are many cable management products and systems on the market, providing an abundance of options to choose from. However, selecting the right type of solution is something that most people generally do not invest a huge amount of time in. This can have a massive impact on the effectiveness and longevity of an network infrastructure installation and, as the old saying goes, failing to prepare is preparing to fail.

When you make an investment in a cable management solution, you need to make sure you are selecting the correct product for the job. But what choices have you got and how do you pick the right one? Here's my advice:

• Trunking
Protects cables and keeps them out of sight – perfect for data and electrical cables. External options are available.

• Cable tray
Supports and routes cables around a building and is ideal for use with multiple data cables.

• Basket tray
Supports and routes the electrical cables that are used for power distribution, control and communication.

• Conduit
Can be flexible or rigid (plastic and metal) and ideal for electrical and data cables. External varieties are available.

• Cable matting
Protects against low level water flooding, attacks from chemicals in floor screed and any sharp edges in a floor finish.

• Braided sleeving
Bundles wires together, helps avoid tangles and offers protection from abrasive environments.

• Cable ties
These secure bundles of cables together.

Traditional cable ties or Velcro based solutions are available

• Cable spines

These manage cables vertically, at or near a desk.

One of the key benefits of installing the correct cable management solution is the time and money it saves. Working with the right product for the job can mean less time spent on installation and labour, while it can also avoid the risk of cables getting damaged. In extreme cases damage can lead to the loss of service and, in some instances, prevent a business from operating altogether. We all know that no business wants to experience downtime.

It also improves health and safety, as poorly installed cabling can be a big hazard. When you have wires lying around, especially on the floor, the chances of slips, falls and other accidents are vastly increased. Removing that obstacle means preventing accidents and protecting staff.

Lastly, it keeps work environments tidy. If you have lots of cables around, they can look unsightly and gather a lot of dust. By using cable management, you are improving the overall aesthetic and feel of a space. This can make employees feel proud of their workspaces and show visitors that you are a professional concern.

Dave Sagrott
Cable Management Warehouse (CMW)

Editor's comment

As one of the unsung heroes of a network infrastructure, the correct specification and installation of cable management has huge benefits. As Dave notes, 'failing to prepare is preparing to fail', so perhaps it's time to raise cable management's profile.

The devil is in the detail when it comes to de-risking data centres

Sharp Group adopts a forensic approach to protecting the sector

While a fire in any setting has the potential to wreak havoc, the scorch marks from an outbreak in a data centre are likely to spread far beyond a facility's perimeter fence.

In addition to the physical risks posed to staff, a spark in one of the technological tinder boxes that make the digital world tick can disrupt the lives and livelihoods of millions.

Increasingly relied on to support essential business, economic and social activities, data centre operators can ill-afford to see their ability to operate seamlessly go up in smoke.

Every second of unscheduled downtime can potentially result in tens of thousands of pounds of lost revenue and perhaps worse still are the long-term losses associated with a blackened reputation.

Customers – be they governments, banks or gaming companies – place high demands on those tasked with overseeing their digital real estate and, in an extremely competitive market, expect an enduring service.

A failure to preserve performance or, in the event of accidental damage, recover quickly is therefore a recipe for smouldering resentment from clients and an efficient means of extinguishing profits.

Given the unthinkable fallout of a blaze, prevention is truly better than the cure when it comes to fire safety, which is why the Sharp Group represents an insurance policy that pays out daily.

The Dublin-based fire and security specialist is already charged with preserving the resilience and effectiveness of eight major facilities in Ireland and has an unblemished record of delivering protection and – in turn – peace of mind to its data centre clients.

From providing a proverbial fire blanket in the form of state-of-the art detection and suppression systems with which to smother any potential risks and minimise the impact in the event of ignition to simply supplying fire extinguishers or training data centre staff how to be vigilant, the Sharp Group tailors its expertise to meet the needs of its customers.

A proficient fire guard, the company is well-versed in the latest technologies, standards and regulations and has pioneered the use of next-generation preventative and reactive measures.

And while it is at ease with installing fire shutters and integrating flame, smoke and heat detectors with existing building management and CCTV systems, the Sharp Group's greatest asset is the quality of its people.

Boasting high retention rates in an industry renowned for a rapid turnover of staff, including individuals who have been with the company since its formation in 1999, the collective experience of the firm's personnel is second-to-none and brings a wealth of knowledge to every job.

Experts in their field, these teams are adept at evaluating and mitigating risks no matter when and where they are engaged. Whether called upon in a consultancy capacity to inform the design of safety systems prior to a build, to assess and advise on maintenance processes or as a single service provider trusted to oversee all fire and security operations, they represent a platinum standard solution.

The devil is in the detail when it comes to de-risking data centres and the Sharp Group adopts a forensic approach to protecting the sector, working with operators to ensure their fire systems and business continuity protocols are perfectly tailored to prevent needless disruption from false alarms and preservation of life in the event of a real one.

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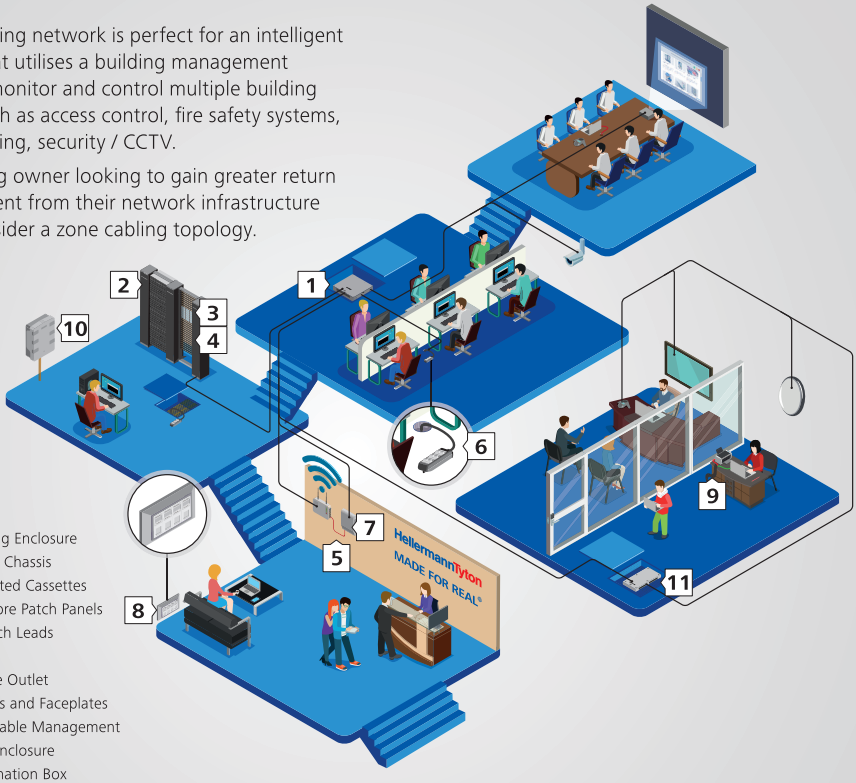

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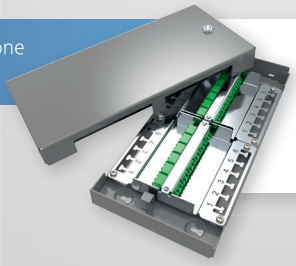

This modular version of the ZTB allows for the use of keystone jacks and fibre adaptors, making it easier to configure each box to your bespoke requirements giving even greater flexibility.

Emission impossible?

Data centre owners and managers are under increasing pressure to make their facilities as energy efficient as possible and aim for carbon neutrality. Inside_Networks has assembled a panel of industry experts to examine if this is anything more than wishful thinking and if the data centre sector is guilty of simply paying lip service to the issue

It has been estimated that the global data centre sector accounts for more than two per cent of total electricity use and generates the same amount of carbon emissions as the airline industry. It's therefore no surprise that data centre owners, managers and users of these facilities are encouraged to do all they can to mitigate this.

In 2020 the European Union (EU) suggested that data centres should be made more energy efficient and be carbon neutral by 2030. It suggests that more efficient cooling systems, heat reuse, renewable energy and the construction of facilities in regions with a cold climate should be considered.

However, with growing pressure for services that have speed, reliability, uptime and availability as prerequisites, some data centres simply aren't focused on energy efficiency. Furthermore, rather than genuinely wanting to do their but to save energy, lower carbon emissions and ensure the welfare of the planet, it seems that some are going through the motions when it comes to this issue.

Inside_Networks has assembled a panel of experts to assess whether a carbon neutral data centre sector is a realistic possibility and suggest what can be done to stem the tide of complacency regarding this subject.

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

STEPHEN BOWES-PHIPPS

SENIOR DIGITAL INFRASTRUCTURE CONSULTANT AT PTS CONSULTING

The announcement that the EUDCA and the European Commission's Directorate General for Communications Networks, Content and Technology (DG Connect) have lined up a list of signatories, including data centre providers such as Equinix, Digital Realty et al, to agree to a voluntary Climate Neutral Data Centre Pact (CNDCP), makes this question more relevant than ever. The CNDCP, we are told, is in response to the EU's Green Deal. However, people should be rightly sceptical about the value of any initiative that appears, on the face of it, to be in direct response to governmental oversight.

The EU Code of Conduct for Data Centres (Energy Efficiency), administered by the European Commission's Joint Research Centre, has been fundamental in the last 13 years in driving better data centre design and efficiency. DG Connect has been drawn into endorsing the CNDCP, which makes no mention of it. The EU CoC is a technical report in the CEN/CENELEC EN 50600 set of standards, which is currently being progressed at ISO/IEC level to be adopted worldwide.

Furthermore, all data centre metrics are being formulated and standardised as part of the ISO/IEC 30134 set of key performance indicators. So why would the CNDCP state that it intends to develop an energy efficiency standard? Efficiency, when applied to data centres, is almost impossible to define in a way that everyone can agree on and explains the use of the word effectiveness in Power Usage Effectiveness (PUE). Working through ISO to develop new data centre metrics is surely better than inventing a new one in the same way that some other industry groups have done.

If data centre providers want to avoid the charge that they are responding to the climate emergency through pure self-interest and window dressing to avoid regulatory oversight, then the CNDCP is not the ideal vehicle to achieve it. Educating lawmakers and working with IT equipment manufacturers and electricity suppliers to improve the efficiency of the IT, and the sustainability of the energy used to power it, would make a greater difference.

Nordic data centre providers have proven that sustainability can be achievable. We can and should do more on our own without the need for grand sounding pacts.

'IF DATA CENTRE PROVIDERS WANT TO AVOID THE CHARGE THAT THEY ARE RESPONDING TO THE CLIMATE EMERGENCY THROUGH PURE SELF-INTEREST AND WINDOW DRESSING TO AVOID REGULATORY OVERSIGHT, THEN THE CNDCP IS NOT THE IDEAL VEHICLE TO ACHIEVE IT.'

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JOHN BOOTH

MANAGING DIRECTOR AT CARBON3IT

The EU defines carbon neutrality as 'having a balance between emitting carbon and absorbing carbon from the atmosphere in carbon sinks'. Removing carbon oxide from the atmosphere and then storing it is known as carbon sequestration and, in order to achieve net zero, all worldwide greenhouse gas emissions need to be balanced by sequestration.

Data centres emit carbon throughout their lifecycles. It is estimated that approximately 10-15 per cent of carbon emissions occur during construction, 80 per cent during operation and 5-10 per cent during decommissioning. At present, most operators cite that they are sustainable and energy efficient by virtue of carbon offsetting, or by investment in renewable energy and virtual power purchase agreements. Indeed, almost 80 per cent of UK colocation data centres are powered by renewable energy, yet this represents less than 200 actual sites and 0.79 per cent of total UK energy use.

That is only the tip of the iceberg and from previous calculations it is estimated that over 12 per cent of UK energy is used to power all data centre facilities including enterprise data centres, server rooms, mobile phone towers, rail and road infrastructure and manufacturing controls. We have no visibility of these shadow data processing facilities.

Guidance, including strategic and cultural change management techniques on how to become carbon neutral is contained in the EU Code of Conduct for Data Centres (Energy Efficiency) and CLC/TR EN 50600 TR 99-2. It is entirely likely that the EU will require the use of the guidelines and standards for any legislative/regulatory changes it may make to achieve the goal of EU data centre carbon neutrality.

I think that commercial operators are trying their best, using Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREEAM) certifications during the construction phase, procuring renewable energy etc. However, they are also missing a lot, such as energy flexibility services, waste heat reuse and using carbon friendly materials in construction. The elephant in the room is that the embodied carbon emissions of ICT equipment is huge and almost impossible to get any information on.

Yes, it is possible to become carbon neutral with some application. To date operators have been doing the bare minimum but this is changing and will accelerate with targeted education and the prospect of regulation.

'IT IS ENTIRELY LIKELY THAT THE EU WILL REQUIRE THE USE OF THE GUIDELINES AND STANDARDS FOR ANY LEGISLATIVE/REGULATORY CHANGES IT MAY MAKE TO ACHIEVE THE GOAL OF EU DATA CENTRE CARBON NEUTRALITY.'

EMMA FRYER

ASSOCIATE DIRECTOR DATA CENTRES AT TECHUK

The EU Green Deal is an ambitious policy initiative with data centres firmly in its scope. Although the exact meaning of climate neutral is subject to debate, the direction of travel is clear. In addition, the new European Commission structure, with DGs organised under three executive vice presidents, is likely to improve coordination and alignment. So paying lip service to sustainability is not an option.

So is carbon neutrality possible? In my view it depends. Operationally, it should be feasible to ensure that facilities consume only electricity from certified renewable sources by 2030. Indeed, many operators are already doing this and larger providers are going further and funding additional, utility scale low carbon generation through power purchase agreements. Others will follow.

When it comes to the nagging issue of standby, green diesel is being trialled in the short-term and large scale battery storage may offer a longer-term alternative – though a viable market may not be established by 2030. Even if it were, diesel phase-out surely will extend well beyond that point, so mitigation will be needed.

We will face bigger challenges, however, if climate neutrality includes Scope 3 emissions extending beyond operations and into supply chains, third-party services and, of course, disposal. Until they are climate neutral, we may struggle on that front.

I'm seeing genuine commitment to carbon reduction. Corporates are reporting formally through schemes like the Carbon Disclosure Project, committing to renewable power through initiatives like RE100 and adopting Science Based Targets – non-trivial undertakings involving supply chain emissions and robust metrics. At sector level, agreements like the Climate Neutral Data Centre Pact (CNDCP) proactively commit operators to self-regulation.

From my perspective, carbon transparency and the high uptake of renewables in the sector are not due to regulation – the real drivers are customer demand, public opinion and energy costs. However, despite being behind the curve on carbon reduction, regulation can help provide scrutiny, governance and a level playing field. And, just in case anyone does fancy a bit of greenwashing, the European Commission is already developing legislation to evaluate green claims and credentials.

'SO IS CARBON NEUTRALITY POSSIBLE? IN MY VIEW IT DEPENDS. OPERATIONALLY, IT SHOULD BE FEASIBLE TO ENSURE THAT FACILITIES CONSUME ONLY ELECTRICITY FROM CERTIFIED RENEWABLE SOURCES BY 2030.'

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IAN BITTERLIN

CONSULTING ENGINEER & FORMER VISITING PROFESSOR AT LEEDS UNIVERSITY

Carbon neutrality for a data centre usually only refers to energy consumption. It ignores carbon emissions of the data transmission network, the embodied carbon in the physical structure (concrete), the M&E infrastructure (iron, aluminium and copper) and the ICT hardware itself, in which we have little visibility of the embodied carbon, as it is nearly all manufactured in Asia, where grids will be far from low carbon by 2030. Our major data centre hubs will also not be zero carbon by 2030.

The EU's Green Deal also avoids the embodied carbon in utility water – treated and pumped. All data centres north of Milan could cut electricity consumption by 30 per cent by using a large quantity of water in evaporative or adiabatic systems, mainly using potable water, which would have other impacts.

Clearly the EU Green Deal is targeted at combating climate change through sustainability. However, true sustainability is only achieved by taking three steps. First, reduce consumption. Second, improve the efficacy of the process. Third, power from a renewable source.

Perversely, many governments seem to encourage consumption by having digital agendas that rollout ever-faster broadband, offer tax concessions to data centre developments and discount power and/or relax planning. Yet they criticise data centre energy growth and ignore that data centres only get built to serve a demand. No one ever built a data centre to save energy and it has been two decades since 'build and they will come', which found that no one came.

Now we actively ignore consumption growth, pay lip service to the second step (PUE stagnant for five years) but put effort into buying low carbon energy through power purchase agreements (PPAs) and virtual power purchase agreements (VPPAs) – local and remote off-setting. This is legal, acceptable in the marketplace and allows the operator to claim 'greenness'.

However, for every 'clean' watt burned in a data centre someone else must burn a 'dirty' watt and the always on nature of data centres means that the intermittence of the main clean fuel, wind (at 11gCO2/kWh, neither zero nor neutral) means that for some of the time (PPAs) or for all the time (VPPAs), the facility consumes higher carbon energy. It is a zero-sum game, which will be evident when we must all use low carbon energy.

'TRUE SUSTAINABILITY IS ONLY ACHIEVED BY TAKING THREE STEPS. FIRST, REDUCE CONSUMPTION. SECOND, IMPROVE THE EFFICACY OF THE PROCESS. THIRD, POWER FROM A RENEWABLE SOURCE.'

JOHN HALL
MANAGING DIRECTOR AT PROXIMITY DATA CENTRES

Whether an initiative such as this is achievable by all operators in Europe within the specified timescale remains to be seen. For older, or already energy inefficient data centres, it could be a challenge.

However, most modern facilities – hyperscale and colocation – are already designed and operated with sustainability, renewable energy and power usage efficiencies built-in. Most, if not all, are already purchasing certified 100 per cent renewable energy and, if any aren't yet doing so, they surely will before long.

Furthermore, some have voluntarily undergone the internationally recognised ISO 1400 accreditation, which specifies the requirements for an effective environmental management system (EMS). Many will also have decided to adopt the Green Grid's Power Usage Effectiveness (PUE) formula as a way of self-measurement when it comes to calculating IT versus facilities power consumption and asserting their overall energy efficiency credentials. There has been ongoing discussion within the industry as to whether PUE should perhaps be replaced, as it can be somewhat subjective. Let's wait and see.

Clearly, responsible operators and their customers fully understand and take their sustainability based responsibilities extremely seriously while, at the same time, striving to deliver the resilient infrastructure that consumers and businesses expect for supporting their increasing usage of the internet and the cloud. Operators and their customers also recognise the cost savings, taxation and competitive advantages of data centres that are fully energy optimised and environmentally friendly.

But there is zero room for complacency. Operators who expect to survive and thrive in the long-term will have to continually work hard to optimise their energy efficiencies and carbon emissions, as demand for compute and the cloud continues to escalate. This does not stop at purchasing 100 per cent renewable energy – it means ongoing investment in solar and wind power to supplement supply from the electric grid, as well as in the latest cooling technologies, sensor based low energy LED lighting and recycling.

'OPERATORS WHO EXPECT TO SURVIVE AND THRIVE IN THE LONG-TERM WILL HAVE TO CONTINUALLY WORK HARD TO OPTIMISE THEIR ENERGY EFFICIENCIES AND CARBON EMISSIONS, AS DEMAND FOR COMPUTE AND THE CLOUD CONTINUES TO ESCALATE.'

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TECHNICAL SUPPORT MANAGER AT VERTIV

Every data centre uses energy to compute or store data and, in doing so, each facility produces waste heat. To be totally green, only electricity derived from green energy sources should be used and the auxiliary machinery that a data centre uses should also be tied to green energy sources.

Of course, if we take this one step further, all the deliveries to a data centre and construction of a data centre, including all the machinery for the infrastructure, should be delivered, installed and removed at end of life by electric vehicles. The people working in the data centre would also need to follow green practices.

So the real question is, if only green energy is used within a data centre, how do we best use that energy to store or convert the data that the computers are working on? In the future, quantum computers will use light, not wires, which does not produce heat in the process.

However, in the short and medium-terms, the best thing that data centres can do is take the waste heat, which is 'low grade', and find a use for it. Scandinavian countries have been doing this for some time, as they have extensive underground water transfer systems that take heat from the data centres into shops, offices and houses for reuse. Some also use these networks for cooling.

Without that type of infrastructure, it's difficult to find a use for low grade heat. Data centre operators may not be interested in building relationships with the users of low grade heat by, for instance, supplying to greenhouse facilities or fish farming businesses. Looking into these options, however, is necessary if data centre operators are serious about improving their energy efficiency and go beyond paying lip service to the issue.

'IN THE SHORT AND MEDIUM-TERMS, THE BEST THING THAT DATA CENTRES CAN DO IS TAKE WASTE HEAT, WHICH IS "LOW GRADE", AND FIND A USE FOR IT. SCANDINAVIAN COUNTRIES HAVE BEEN DOING THIS FOR SOME TIME, AS THEY HAVE EXTENSIVE UNDERGROUND WATER TRANSFER SYSTEMS THAT TAKE HEAT FROM DATA CENTRES INTO SHOPS, OFFICES AND HOUSES FOR REUSE. SOME ALSO USE THESE NETWORKS FOR COOLING.'

On your marks, get set, go!

Robert Luijten of Fluke Networks explains how to certify fibre using an optical loss test set (OLTS) and how to get the best out of this equipment

An OLTS is a highly accurate instrument that combines a power meter and source in both the main and remote units. It is the best tool to determine the total loss or attenuation of optical fibre links.

POINTS OF ORDER

In order to ensure accuracy it is important to set-up an OLTS correctly. Here's how:

- Allow sources to stabilise by turning on both the main and remote units about five minutes before starting to make any measurements. It is key to allow extra time for the sources to stabilise if the change in environmental temperature is significant. If the sources do not stabilise there will be issues with setting the reference as the source warms-up and its output power increases, resulting in optimistic or negative loss readings.
- Establish and enter the correct pass/fail test limits for the links being tested.
- Set the reference correctly in order to remove the impact of the various connections between the tester and the links under test. Preferably, this should be done using the one jumper method. If reference setting is done incorrectly, undesirable negative loss measurements will typically occur. A negative loss is often referred to as a 'gainer' and should not be

possible on a passive link. When setting the reference ensure this is done with clean, high-quality test reference cords (TRCs), as required by ANSI/TIA and ISO/IEC. Dirty or defective TRCs will result in links not passing. Keep in mind that TRCs can wear out or be damaged if not treated correctly, so always replace dust caps to protect end-faces and do not set bare end-faces on surfaces.

- Ensure the connectors on the test instruments themselves are clean. This is often overlooked and feedback from Fluke Service Centers has indicated that a very high percentage of instruments sent in for repair were only suffering from dirty fibre optic connectors. Inspecting and cleaning instrument connectors can be carried out in the field with the very same equipment that is used to inspect and clean TRCs and connectors in patch panels.

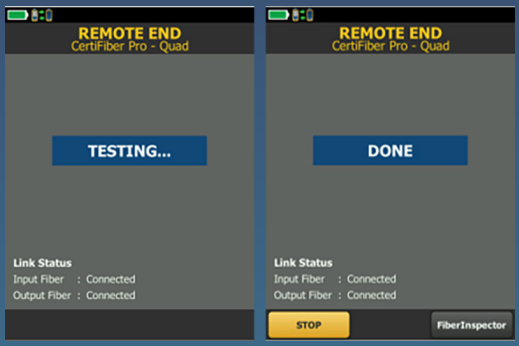
CLEAN AND TIDY

Since contamination can have a significant impact on optical power, the critical initial step in the certification process, before connecting fibre links to the tester, is to inspect and clean, if necessary, both ends of the links under test. The best way to do this is with an OLTS that has the ability to inspect and certify fibre optic end-faces at both ends.

Traditional OLTSs have one main unit with a display and a remote unit. This means that a separate inspection tool must be carried to the remote end to view and document the end-face. With some leading systems a second main unit can be configured to function as a remote unit.

While the main unit is always in control of the OLTS test, the technician at the far end can now access the fibre inspection tool. The same inspection features as on the main unit are then also available on the remote unit. Once the inspection and certification of the end-face has occurred, data is stored in the remote unit. Inspection results and images from both the main and remote units can later be merged at the time the certification report is being worked on in the reporting software, or with a cloud-based service.

The actual certification can now take place and the OLTS can be connected to the links under test. Keep in mind that bi-directional tests will be executed and that basically two links are being tested simultaneously – an input fibre and an output fibre. While the main unit is executing the OLTS test and storing the loss results, the remote unit will flash messages to inform the remote user about progress.



UNDERSTANDING THE RESULTS

In this article we focus on bi-directional, dual wavelength fibre link certifications, as results of measurements made in both directions can differ from one another. In case multimode fibre is being tested, the

‘Keep in mind that TRCs can wear out or be damaged if not treated correctly, so always replace dust caps to protect end-faces and do not set bare end-faces on surfaces.’

following measurements are made:

- Optical loss of Fibre A at 850/1300nm
- Optical loss of Fibre B at 850/1300nm
- Length of the fibre by using round trip propagation delay
- Comparison of the losses to the chosen test limit resulting in a pass or fail

In some cases testing in only one direction may suffice. However, testing in both directions is required to determine length, find fibre core mismatches in splices and detect links in which fibres of different core sizes are mixed.

NO BRAINER

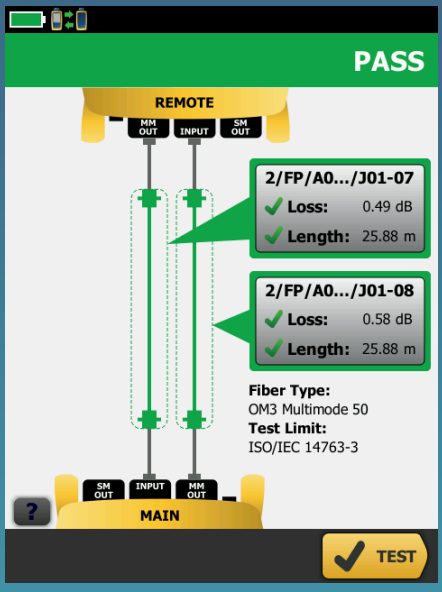
It is almost a no-brainer to certify bi-directionally at dual wavelength. Not only does it prove good workmanship but, ideally, measurements must also made at multiple wavelengths, as the fibre should be tested using the same wavelength that will be used for transmission.

Therefore, multimode links are tested using 850nm and 1300nm wavelengths and singlemode links using 1310nm and 1550nm wavelengths. Keep in mind that there could be significant attenuation differences caused by wavelengths, especially in longer links, as the loss per km in fibre is not the same at every wavelength. For example, for multimode fibre the loss is about 3dB per km at 850nm and 1dB per km at 1300nm.

Interestingly, when testing singlemode links, the 1310nm wavelength is more sensitive to alignment problems and the 1550nm wavelength is more sensitive to issues caused by bends and cracks in the fibre link under test. Comparing the 1310nm wavelength loss with the 1550nm wavelength loss can indicate a bend or crack is present if there is more loss at the 1550nm than at the 1310nm wavelength.

PASS AND FAIL

In the graphic below, notice first the green pass. The screen highlights that the measurements were already saved as the tester is ready to test a new set of links – hence ‘test’ at the bottom right of the screen. The label IDs of the input fibre and the output fibre are also visible in the boxes showing the loss and length measurement results.



If a fibre should fail, two options will appear – fix later, where it saves the result, and test again, where you simply retest. Fix later creates a list of all links with issues that the crew executing the tests did not solve. An

expert can then come in to ascertain which links needing fixing. The results can be recalled and the option to retest the link is provided.

THINK AHEAD

Installers need to regularly re-evaluate their test equipment and procedures. Setting a reference through a bulkhead adaptor is no longer an option – the reference has to be continuous from the source to the meter using one TRC. On top of that the custom test protocols may specify that fibre reference setting is required multiple times per day. TRCs must also have reference grade connectors, which ISO/IEC 14763-3 defines as being ≤0.1dB for multimode and ≤0.2dB for singlemode. When a low loss cassette has a 0.15dB LC connector, testing it with anything worse than a 0.15dB LC connector is going to result in a pessimistic result or potential failure. ■

ROBERT LUIJTEN

Robert Luijten is Fluke Networks' EMEA training manager. A true test and measurement expert, with more than 38 years of experience, he was responsible for the European launches of the Fluke Networks DSP-4000, the DTX CableAnalyzer, as well as the Versiv cabling certification system.

Patch Solutions

Available from Patch Solutions, the Patch App & Go network tester and tracer is a low cost copper testing solution that uses a smartphone with intelligent RJ-45 plugs.

Patch App & Go quickly identifies any wiremap errors in cabling, such as mis-wires, split pairs and short and open ends, which need further attention. It can print a site file PDF report, or simply fix and retest. The starter bundle consists of six smart plugs, while a 24 plug mega bundle is also available for larger installations – saving you time and money.

Patch App & Go can test for continuity, as well as being a cable tracer, and it has quickly become an essential addition to any network engineer's tool-bag. If you have legacy patch panels that are in need of relabelling, the starter kit will allow you to troubleshoot in a matter of minutes, visually displaying a pass or fail, whilst confirming the correct port location.

For more information **CLICK HERE.** **patchsolutions.com/patch-app-and-go**

Networks Centre

Whatever the LAN configuration, testing is the main method of compliance demonstration to the customer. Test equipment availability and the competency of test engineers are therefore critical to business success.

Networks Centre is expanding its range of specialist test equipment services. As well as service and calibration packages like the popular Fluke Networks Gold and Fleet contracts; hire services for Fluke Networks, Sumitomo and EXFO equipment; and in-house certification backed training such as the Fluke Networks Versiv course, Networks Centre recently launched its Concierge Service for all Versiv kit and Sumitomo splicing machines.

So what does the Concierge Service provide?

Test equipment like the Fluke Networks Versiv needs to be available at all times, yet predicting clashes between calibration/repair and project demands is not possible. The Networks Centre Concierge Service takes all that worry away. It supplies a replacement for however long the tester is away, arranges for collection and delivery, and keeps track of calibration dates, providing reminders. It is the perfect accompaniment to the Fluke Networks Gold service package.

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

Comtec

Comtec offers test and measurement solutions for a wide range of applications and represents many of the industry's leading brands including AFL, Anritsu, ComSonics, EXFO, Fluke Networks, Honeywell, Ideal Networks, Martindale, Patch App & Go, SAGAB, Televes and Tempo Communications.

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Network Testers

Network Testers is pleased to offer the full Kurth Electronic range of German made no-nonsense, high quality LAN cable and network verification test products to the UK market. Core products are the KE7000 Ethernet FlexiTest, the KE7100 LANcheck and the KE7200 Ethernet Performance Tester.

- The KE7000 (supplied as a pair) is for wiremap cable testing and delivers clear results even with multiple faults present – available at both ends of the link.
- The KE7100 adds precise time domain reflectometry (TDR) based fault location for shorts and opens, loaded power over Ethernet (PoE) testing and active port finder features.
- The KE7200 builds further to add speed detection to 1Gb/s, active network scans, ping stress tests and comprehensive report generation.

Starting from under £100, each product also features a range of test kits that combine carefully selected accessory items or complementary products from the Kurth Electronic range to provide comprehensive professional testing solutions contained in robust carry cases.

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Making the most of it

Multigigabit/NBASE-T facilitates data rates of 5Gb/s or higher on cabling that was originally designed for 100Mb/s or 1000Mb/s. Dan Barrera of Ideal Networks explains how it's possible to determine whether cabling is multigigabit compliant

Historically, when faced with old cabling and a need to deploy modern high-bandwidth applications, network owners had to decide whether the cost and disruption of removing old cable and replacing it was worth the benefit of deploying a new high-speed network. However, a new option is available that makes it possible to obtain a five times or more increase in bandwidth without re-cabling. The technology goes by two names – NBASE-T and multigigabit. Both started as competing standards that eventually merged into a cross-compatible specification (multigigabit will be used from here on).

USE YOUR HEAD

Multigigabit takes advantage of the headroom in Category 5e and 6 cabling to squeeze additional bandwidth out of a system by creating two new data rates that fall between existing 1Gb/s and 10Gb/s

	Cat 5e Class D	Cat 6 Class E	Cat 6A Class E
1000BASE-T	✓	✓	✓
2.5GBASE-T	✓	✓	✓
5GBASE-T	?	✓	✓
10GBASE-T	?	?	✓

rates. 2.5GBASE-T and 5GBASE-T data rates can be achieved by replacing existing switches and devices with multigigabit compatible equipment. Faster speeds on older cabling are not guaranteed with multigigabit but the general rule of thumb follows the chart above.

With cabling installations that comply with ISO/IEC 11801-1, EN 50173-1 or ANSI/TIA 568.1-E, 2.5Gb/s is expected to operate on Class D/Category 5e or better, 5Gb/s on Class E/Category 6 or better and, of course, 10Gb/s on Class EA/Category 6A or better. This is not a rule, just the general expectation. In fact, Class D/Category 5e may support 5Gb/s or even 10Gb/s if the cabling is very high quality and the lengths are short enough to minimise link loss. Conversely, poor quality or exceedingly long Class D/Category 5e may not support 2.5Gb/s as expected.

So before spending the time and money to upgrade a network, how is one supposed to know whether migrating to multigigabit will be a success or a failure?

TWICE AS NICE

There are two supported methods of testing existing cabling's ability to support multigigabit. First is using a traditional cable certifier with specific test settings for 2.5Gb/s or 5Gb/s. Either of these two test settings can be run on Class D/Category 5e or Class E/Category 6 cable. If the test passes the cable should support the new applications.

The only downside to the certifier solution is that most network integration companies and in-house IT departments do not own cable certifiers because of the cost and limited use they would get out of them. The second option is to use an Ethernet transmission tester, which is a device that sends Ethernet frames through cabling or the network to determine the maximum data rate that can be achieved without dropping frames.

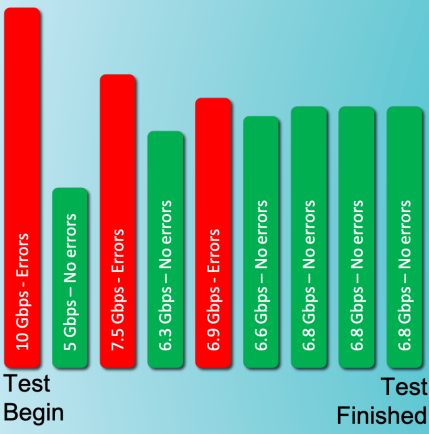
Not all types of transmission testers are the same. Some are capable of testing just cabling and others can test active network links in addition to cabling. When deploying multigigabit, it's important to use a tester that operates on both to provide the most flexibility. The difference being that testing only the cabling is helpful in determining whether installed cabling will support multigigabit, and the ability to test on active networks allows for stress-testing the complete network and troubleshooting a wide variety of problems.

TO THE MAX

A maximum throughput test works by zeroing in on a sustainable data rate using a binary chop process, which allows for automated testing in less time than other methods. It begins with the highest possible data rate and transmits data while listening for errors. Should any errors be detected, the algorithm will choose a data rate half as high and try again. If there are errors the data rate will be cut in half again, or if there are none the rate will increase to a level between the two previous tries. The process repeats until it settles on a data rate that can be sustained without errors.

	Operating Frequency	Min. Cabling Grade	Certification Frequency
1000BASE-T	62.5MHz	D/5e	100 MHz
2.5GBASE-T	100 MHz	D/5e	100 MHz
5GBASE-T	200 MHz	E/6	250 MHz
10GBASE-T	400 MHz	E_A/6A	500 MHz

This is the same process used by the internet speed test apps that are available on computers and mobile devices. Notice on those apps that in the first second the speed meter fluctuates wildly as the system oscillates between very fast and very slow until it stabilises on a speed that can be sustained with a tolerable error rate. A maximum throughput test is doing this same thing on the network or cabling – it's a fast and effective method of demonstrating network performance.



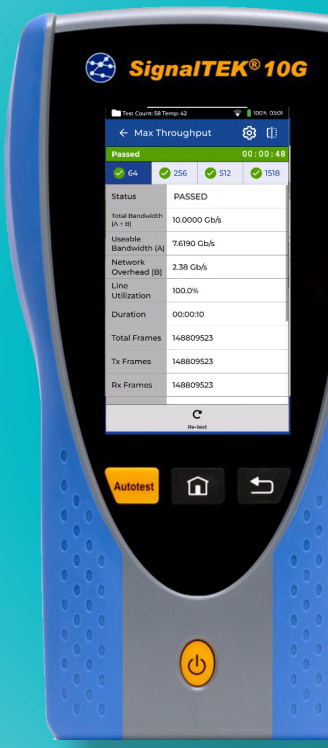
DEFINITIVE ARTICLE

When used on cabling, the maximum throughput test tells the user definitively whether the link will support multigigabit, and with how much margin. In the above figure, the example link can sustain 6.8Gb/s which is 1.8Gb/s (36 per cent) more than necessary for 5Gb/s multigigabit.

If the above results were obtained from a test on an active 10Gb/s network link, it would indicate that there is problem somewhere in the system, which is causing a reduction in expected bandwidth. To troubleshoot the problem, it is necessary to test each component of the system individually. For example, connect it directly to the switch to make sure it is not a bottleneck, test the horizontal cabling by itself and, most importantly, test individual patch cords. Low quality patch cords can often be a limitation in successful 10Gb/s deployment.

THE RESULTS ARE IN

The results from the maximum throughput test below show the results for various frame sizes, which demonstrates the difference in network efficiency as a function of frame size. When 64-byte size frames are used on a 10Gb/s link, the usable bandwidth is 7.6Gb/s and the network overhead is 2.4Gb/s, meaning almost one quarter of available bandwidth is used by the network and not carrying user data. Larger frame sizes are much more efficient though they are more susceptible



'Multigigabit provides a simple and cost effective way to significantly upgrade network bandwidth in existing networks without re-cabling.'

to network jitter which causes glitches in audio/video conferencing, as well as more noticeable video freezing when frames are dropped.

Having insight to the efficiency of the network when carrying different types of payloads can be very useful to network administrators. For example, if a switch is dropping small sized frames while passing 100 per cent of large frames it can mean that its processor isn't able to process the high frame rate of small frames versus the low frame rate of large frames. The solution is to upgrade the switch to one that is capable of processing more frames per second than the existing switch.

SIMPLE AND EFFECTIVE

Multigigabit provides a simple and cost effective way to significantly upgrade network bandwidth in existing networks without re-cabling. And while most users in a typical office environment may be satisfied with a gigabit connection to the network, applications like wireless access points are prime targets for such an upgrade. Whether it is by cable certification or Ethernet transmission testing, a seamless migration from 1Gb/s to 2.5Gb/s or 5Gb/s can be assured if the existing infrastructure is tested for compliance before dipping your toes into the upgrade path that is multigigabit. ■

DAN BARRERA

Dan Barrera is global product manager data cable testers at Ideal Networks, where he manages product development of the group's data cable and network installation and maintenance test equipment. Barrera enjoys public speaking, the facilitation of technical presentations and getting involved with hands-on training seminars for industry organisations such as BICSI, IBEW/NJATC and CEDIA. Today he represents Ideal Networks on the TIA TR-42 and ISO SC25/WG3 and WG9 committees, developing the latest standards for copper and fibre optic cabling systems.

New management appointments announced for R&M Americas


Paulo Campos


Edison Castro

R&M has appointed Paulo Campos as executive vice president R&M Americas and managing director R&M USA. In addition, Edison Castro is the new managing director for R&M's South America business.

Campos' focus will be on the further development of R&M's business and positioning in North America and South America. He said, 'R&M is already well positioned in both markets. I am excited to merge the two regions and to take them to the next level. There are many synergies from which our customers across the two continents can benefit.'

Castro added, 'It is an honour to be part of R&M, to lead the team and to contribute to the success in this growth region. A new stage in my career has begun and I am completely committed and motivated to be part of R&M's further growth path in South America by supporting our customers with our high-quality products and solutions.'

Excel Networking Solutions announces country manager for Finland

Excel Networking Solutions has appointed a new country manager for Finland. Markku Lönnberg joins Excel's international team to focus on maximising opportunities and broadening the company's reach into Finland and the wider Nordic region.


Markku Lönnberg

With over 20 years of experience within the Finnish market, Lönnberg's knowledge of the industry and understanding of Excel's growing product portfolio will be critical to his success with the business. He will be working with Excel's regional sales manager, Andrew Powell.

Lönnberg commented, 'I am very excited about this opportunity. I'm looking forward meeting all my new colleagues and working together with both old and new customers and to be able to offer them Excel's solutions. There will be lot of challenges in these difficult times but I have a strong belief that we will be able to overcome these to maximise the market's opportunities.'

Ideal Networks gets set to become Trend Networks


Paul Walsh

Ideal Networks has announced that it will be known as Trend Networks from 31st March 2021. The company aims to better reflect its vision, mission, goals and position as a partner providing customers with innovation alongside dependable results, equipment and support.

For the name Trend Networks the firm looked to its history in the field of test and measurement. Trend Communications was a telecoms test equipment manufacturer founded in 1965 and, over almost four decades, it launched numerous innovations – from telegraph testers to telex machines, data transmission analysers and ISDN testers. Trend Communications was acquired by Ideal Industries in 2004 and later became part of Ideal Networks.

'Trend Communications was a leading business with a strong reputation and a dedication to delivering industry firsts,' explained Paul Walsh, CEO at Ideal Networks. 'Under the name Trend Networks we share this same goal. However, our dedicated team remains unchanged and our products are unaffected by the name change.'

CHANNEL UPDATE IN BRIEF

Velocix has promoted Anthony Berkeley to chief executive officer.

Ping Identity has appointed Peter Burke as its new senior vice president of research and development.

Dixa has acquired Melbourne based Elevio in a circa US$15m deal.

LogicMonitor has formed a partnership with Fusion Global Business Solutions. Fusion joins an elite group of resellers, systems integrators, managed service providers and technology integrators within the LogicMonitor Partner Network.

Infovista has appointed Kristian Thyregod as president global enterprise.

North has appointed Paul Comerford as its new chief operating officer. The hire is part of the company's growth strategy and will see Comerford join North's executive leadership team, reporting directly to chief executive officer, Glen Williams, who joined the business at the start of this year.

Misr Systems has been named Gigamon's EMEA Partner of the Year.

Leading from the front

Henry Siemon recently became the fifth CEO and president of the family business that bears his name. Rob Shepherd spoke to him about his life, career and the challenges ahead

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

HS: I was raised in Watertown, Connecticut, just a stone's throw away from the Siemon headquarters. I now live nearby with my wife and three sons.

I earned my undergraduate degree in international business and economics from the University of Richmond in 2007. Following this I went on to work in management consulting for Deloitte Consulting until 2012. I then took a couple of years to earn my MBA from MIT Sloan School of Management, where I focused on operations and supply chain. This resulted in an opportunity to work for Apple for a few years on its global supply chain team and later lead parts of its reseller operations organisation.

In 2017, I joined Siemon with a focus on supply chain and operations, which was an ideal fit given my previous experience. At the beginning of 2021 I transitioned into the role of CEO and president, succeeding my uncle, Carl Siemon, who served in that role for 38 years. I am the fifth president since the company was founded in 1903.

RS: What do you hope to achieve during your tenure as Siemon's president and CEO, and what do you consider to be an immediate priority?

HS: My immediate priority is to help our team successfully navigate through the uncertainty created by the coronavirus pandemic, which will not disappear in the short-term. Our global teams have done a fantastic job over the past year in adapting to this environment and there is no doubt in my mind that we are stronger today as a result.

My long-term aim is to build upon the company's strengths and capabilities to establish a stronger market position. To achieve this, we will prioritise our efforts

> 'Early in my career at Deloitte, I had the good fortune to develop a mentor relationship with a partner that I held in high regard. He shared with me a quote from Confucius – "If you are the smartest person in the room, then you are in the wrong room"'

where we can add the most value and continue to drive innovation in all that we do. We are proud of where we stand today as an organisation but acknowledge the industry is in a constant state of change.

RS: How 'hands-on' is your management style and have you any direct experience of installing your company's products?

HS: I'm quite hands on in the sense that I enjoy learning as much as I can about every part of our business. I also enjoy helping to solve complex challenges, so will jump in when it makes sense to do so. However, we have incredibly strong teams and I consider myself fortunate to have complete trust in our company's leaders and others throughout the organisation. This gives me the ability to step back while the teams know I'm always available to support if needed.

Regarding direct experience of installing Siemon products, about 18 years ago when I was in college I spent a summer working for one of our certified installers here in the US. That experience was a great learning opportunity for me, allowing me to gain first-hand knowledge of our products and how they're deployed in the field. That experience has also left me with an indelible understanding of the importance of developing reliable, high performing installer friendly products.

RS: What challenges do vendors of copper and optical fibre based network infrastructure solutions currently face?

HS: The changes to working patterns and how we collaborate with one another over the past year have challenged all organisations to adapt rapidly – developing and deploying solutions on the run to ensure business continuity. Specific to network infrastructure vendors, organisations with a robust supply chain and inherent redundancies in place have been able to manage these changes efficiently, whereas others have found it difficult.

Aside from the pandemic, we have seen

the nature of network equipment and applications shift dramatically over the past two decades. Whereas connections at the edge of the network were mostly to the desktop, convergence of applications over IP-based infrastructure has transformed the types, quantity and locations of network devices. A catalyst for this evolution has been power over Ethernet (PoE). Siemon has been at the forefront in providing network infrastructure solutions that are specifically designed for convergence related applications, helping to break through the barriers of traditional structured cabling.

Likewise, today's data centres are experiencing rapid growth in processing requirements and a seemingly unstoppable demand for storage. At the same time, power needs are on the rise and space is becoming an increasingly precious resource. Fundamental shifts at the core of the network, from the traditional three tier data centre design to a two tiered spine and leaf architecture, have posed new challenges and opportunities for infrastructure solutions capable of low latency and terabit level data transfer, while providing modularity, interoperability and a migration path for future applications.

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

HS: This varies by customer. Traditionally, awareness has been quite low in most instances, although in recent years, as more applications have transitioned to IP based connections, the impact of physical infrastructure is being seen and felt more for everyday users. Along with this, the benefits to costs, efficiency and productivity have been realised at the executive level.

It can also depend quite heavily on who is making the infrastructure decisions and whether there is a team in place dedicated to this discipline, or if it is overseen by a more reactive IT or facilities team that doesn't give consideration to the physical layer until something isn't working.

We pride ourselves on our consultative approach and having a team of experienced professionals that can guide end users to the best technical solution for today's needs, while also giving them a foundation for growth in the future. Consistently connecting with these experienced professionals to understand the importance of a proper infrastructure will continue to drive improved engagement and effectiveness. It's an ongoing process, but awareness is certainly improving as those of us in the industry continue to educate others.

> 'I'm quite hands on in the sense that I enjoy learning as much as I can about every part of our business. I also enjoy helping to solve complex challenges, so will jump in when it makes sense to do so.'

RS: What single piece of advice would you give an installer or end user looking to purchase a structured cabling system?

HS: Talk with your infrastructure provider and take time to consider your options. These partners have experts

available to help guide you on the latest technical standards and trends, as well as the experience to help guide your team to deploy a solution that becomes an asset and investment for your organisation, rather than a burden.

Typically, physical infrastructure represents the lowest cost of the overall IT spend within a project but also represents the most critical aspect, as it is the foundation. A well-planned infrastructure is intended to last 10-15 (or more) years and many generations of active equipment. If you get your design correct from the beginning, across the lifetime of that system you will reap the benefits as you seamlessly transition to support new applications, performance requirements and business developments.

RS: It's that crystal ball moment – how do you see the world of structured cabling developing over the next few years and what would you like to see happen?

HS: For the enterprise, we foresee our industry expanding through the adoption of new types of cables and connections that break the 100m, four pair paradigm. One example is Single Pair Ethernet (SPE), which can provide power and data over single pair link segments up to 1km in length. This network technology has far reaching implications and is being actively developed for use in the transportation industry, industrial applications, as well as the internet of things (IoT) as a long-awaited alternative to legacy building control systems like BACnet and proprietary cabling.

For the data centre, there will be a long-term convergence towards singlemode fibre, multifibre connectors and continued expansion of both passive and active direct attach cable (DAC) assemblies. While direct attach products are not structured cabling per se, they will continue to serve a vital role as part of the data centre ecosystem for the foreseeable future.

We welcome these and other trends that create a strong foundation for emerging networking technologies that enhance safety, sustainability and quality of life on our planet.

RS: Who is the person you most admire and why?

HS: It's a long list and, to be honest, it is constantly changing depending on what is going on in the world or what I am reading. In terms of public figures, at the moment my answer is General Stanley McChrystal. I recently read a book where he outlines his approach to leadership during his service in the US Army and there is much to be admired.

A central theme is his view of what leadership looks like. His perspective is that leaders should not seek to be master chess players dictating every move – rather, they should become gardeners who create an environment where every individual can grow and develop.

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

HS: Early in my career at Deloitte, I had the good fortune to develop a mentor relationship with a partner that I held in high regard. He shared with me a quote from Confucius – 'If you are the smartest person in the room, then you are in the wrong room'. In an industry where everyone sought to be the best, he was sharing with me that it's more important to surround oneself with the best.

This has steered many of my decisions as I seek to work with people that I will learn and grow from. As an aside, he is now the CEO of Deloitte Consulting, so it's safe to assume this advice has served him well! ■

Quick clicks

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

The Embodied Carbon in Construction Calculator (EC3), hosted and managed by **Building Transparency,** can measure Scope3 GHG emissions for data centre facilities. **CLICK HERE** to find out more.

Smart Buildings on the Move is a blog by Andreas Rüsseler of **R&M.** **CLICK HERE** to read it.

Top 5 Best Practices for Data Center Perimeter Security is blog from **Sunbird Software.**
CLICK HERE to read it.

Considerations for Using Hybrid Copper-Fiber Cable is a blog from **Fluke Networks.**
CLICK HERE to read it.

The Software-Defined Power Advantage is a white paper from Harry Soin of **Advanced Energy** and Jeff Zanardi of **Virtual Power Systems.**
CLICK HERE to read it.

How Fibre Optic Cables Are Made is a video from **Nexans.**
CLICK HERE to watch it.

The Value of Remote Management for the Changing Data Centre Model is a blog from **RiT Tech.**
CLICK HERE to read it.

Taking care of business

As the IT network is the digital foundation of the intelligent building, Mike Holmes of Nexans looks at the role cabling infrastructure plays and what to consider when specifying it

Our working practices are changing. As a consequence, workplaces need to adapt to flexible usage and greater efficiency. At the same time, new technologies are rapidly integrating, presenting new challenges and opportunities – but making the most of these requires thought and preparation.

FORM AND FUNCTION

Intelligent buildings provide functionality far beyond that of traditional building management systems, and bring economic, social and environmental benefits to owners, tenants and staff. Benefits range from saving energy and improving productivity to increased comfort and safety – but only if a network supports different systems' bandwidth and power requirements.

Building internet of things (BIoT) connects in-building devices such as sensors and access control, as well as heating, ventilation and air conditioning (HVAC) and metering systems to an (often) Ethernet based network. This connects input from devices such as actuators, switches, system controls and so on with intelligent software, allowing building systems and spaces to function optimally.

Building systems – from audiovisual and access control to fire systems and LED lighting – are merging on to IP networks to allow an almost unlimited number of devices to be connected. Connected IP devices use the same protocols end to end,

so all devices work together seamlessly and can directly communicate with cloud applications.

SUPPORT STRUCTURE

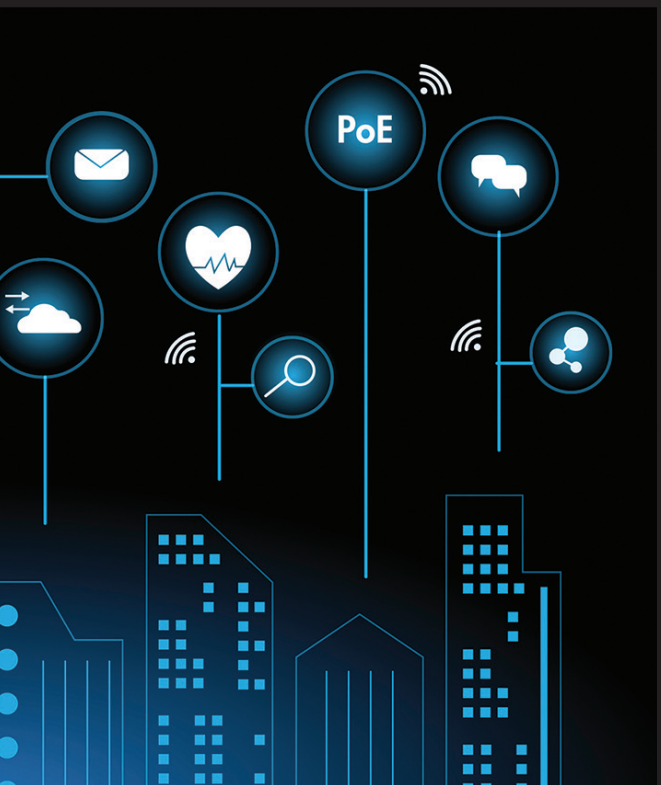
During the coronavirus pandemic this support has become even more important. Many office buildings have been left largely vacant, with a skeleton staff in attendance. This makes automated security, CCTV, monitoring and access control systems vital.

Smart systems based on IP connected sensors and actuators can help reduce costs and prevent power wastage by, for example, closing down unoccupied building areas so lighting and HVAC are not used. It's likely that workspaces will continue to become more flexible as people continue to work from home post-pandemic. BIoT tools based on LAN and IP connectivity can support optimised occupation and make it feasible to automatically restrict the number of people entering certain areas, to support social distancing measures.

POWER TO THE PEOPLE

Today's LAN can offer a physical communication layer as well as power over Ethernet (PoE). PoE provides data and power through the same copper cable, eliminating the need for a separate power cabling infrastructure.

The latest PoE standard – IEEE 802.3bt – offers up to 90W output power at the power sourcing equipment (PSE) and 71.3W at the powered device (PD). Furthermore, the latest standard supports 10GBASE-T, making it possible to provide 10Gb/s transmission speeds while supporting power delivery over copper. However, the consequence of this is that the higher the power the more heat is generated in the cable bundles – especially when lower category cabling is used.



PUMP UP THE VOLUME

Increasing bandwidth becomes essential as the volume of data increases with demand from applications. Drivers include high resolution video conferencing and centralised or cloud data access, as well as a double digit increase in the number of wireless devices. However, bandwidth is often diluted with the number of connections – to the point of becoming unusable.

Wi-Fi 6 (IEEE 802.11ax) counters this by offering higher user bandwidth and channel efficiency. However, as data rates and bandwidth go up, the reach of the

wireless network decreases. Therefore, it is recommended to add significantly more wireless access points and check current cable length limits. 10Gb/s over Category 6A cabling supports high bandwidth and power levels without the risk of overheating in large bundles.

'The key to selecting the right cabling infrastructure is to provide a flexible solution that supports the different bandwidth and power requirements of services and devices in various locations.'

SUPPLY AND DEMAND

Flexibility will help keep up with the increasing demands and changes that occur throughout a building's functional lifetime. Smart building networks have to keep up with demand that is going to keep expanding in coming years – the introduction of new applications and devices, and the constantly changing use of building spaces. The key to selecting the right cabling infrastructure is to provide a flexible solution that supports the different bandwidth and power requirements of services and devices in various locations.

It's important to answer a number of questions first though:

- What type and level of performance do users and devices require – not only right now but also in the future?
- What specific conditions exist in the building or buildings?
- What distances need to be bridged?
- Are there specific requirements with regard to functionality, such as powering devices, or uptime?
- How flexible does the network need to be to accommodate probable future requirements?

TALKING POINTS

Neither optical fibre or copper are 'better' for smart building developments – both have their place, depending on the specific requirements. Besides speed and latency, there are other considerations that need to be taken into account. Fibre is best wherever the highest speeds and lowest latency are required, however, not every connection requires the highest possible speed.

In short, fibre offers fast speeds and data delivery over longer distances and generally requires less space. However, it's costly, requires dedicated equipment and is over-specified for many day-to-day uses, both for now and in the foreseeable future. Copper may have some inherent limitations with regard to distance, but it offers sufficiently high speeds for countless practical applications, such as connecting wireless access points. What's more, copper's support for PoE contributes significantly to ease of design and network flexibility.

OFFICE POLITICS

A traditional LAN often uses fibre for the backbone to the different floors and copper for the horizontal cabling on the floors themselves. As an alternative, a fibre

to the office (FTTO) solution combines the best of both worlds – fibre is laid from a central switch to a connection point in the office or workplace. From here, a dedicated Ethernet switch ensures intelligent media conversion from fibre to copper for easy connection to the end device. Furthermore, the device can be powered by PoE more efficiently, as there is no wastage as a result of heat in long cable bundles.

Using this approach, a network of smart digital products and applications, often installed in the digital ceiling, allows networks to support a wide range of devices and applications. This makes it possible to keep up with demand that will continue to expand in coming years, with the introduction of new applications and devices and the changing use of building spaces.

SINGLE LIFE

New Single Pair Ethernet (SPE) equipment will open the way for an extension to the main four pair network, and is designed to support intelligent building systems. This technology will enable economical, high-density deployment of a whole new wave of connected sensors and controls that will make our buildings even smarter.

New technologies are changing the design, implementation and management of data and power infrastructure. For years to come, fibre and copper solutions will exist side by side, each used in applications where they add the greatest value, at a price point that makes sense for the business case. Taking time to select the correct type and quality for each part of the network really pays off in the long-run.

THINKING BIG

By connecting a wide variety of devices to a single network, it becomes possible to take a far more holistic approach to automate the implementation and management of in-building data and power infrastructure, occupancy monitoring, and building control and security systems. Not only will this approach support the introduction and expansion of new technologies, it will also reduce costs whist improving the safety and comfort of a workplace. ■

MIKE HOLMES

Mike Holmes is marketing manager at Nexans and has worked in the cabling industry for over 30 years. Following a period at Pirelli, he joined Alcatel in 1994 as the UK product manager for optical fibre and copper LAN cables. He has worked in various product management and marketing roles within Nexans in the UK and Europe, where he is now responsible for channel marketing programmes.

Leviton

As connected technology and the internet of things (IoT) proliferate into every area of the enterprise, many organisations are considering an intelligent or smart building infrastructure. Yet this undertaking can bring challenges and complex choices that aren't always apparent at the outset.

Leviton can help you build the ideal infrastructure for smart buildings, with cabling systems that are optimised for power over Ethernet (PoE) and solutions designed for connecting remote smart devices.

CLICK HERE to check out our white papers, on-demand webinars and other resources to prepare your network for the future.

www.levitonemea.com

Siemon

In an ever-changing landscape it is critical to have infrastructure solutions that can keep pace with your business needs. To support you, Siemon provides a range of industry leading Category 6A solutions that are perfectly aligned to intelligent building requirements.

The Z-MAX Category 6A copper cabling system has best in class performance, the industry's fastest termination and remote powering capabilities. It provides an ideal IP based physical infrastructure to effectively converge data, voice, video, lighting, security, building automation and other low voltage building systems in today's intelligent buildings.

For field termination needs, the Siemon Z-PLUG enables the seamless connection of power over Ethernet (PoE) devices for a range of applications including lighting, wireless access points, audiovisual equipment, distributed antenna systems (DAS) and building automation systems (BAS). Z-PLUG can be terminated to both shielded and unshielded, as well as solid and stranded cables. It eliminates the need for work area outlets and patch cords, enabling custom length cables that can be terminated on-site for quick connections directly to the end device.

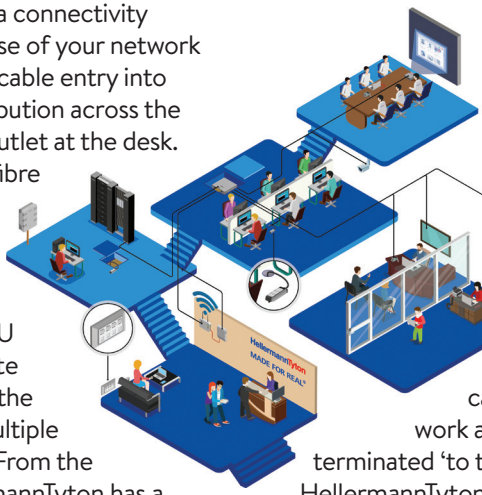
To find out more **CLICK HERE.**

www.siemon.com

HellermannTyton

HellermannTyton has a connectivity solution for every phase of your network infrastructure – from cable entry into the building and distribution across the building, to the data outlet at the desk.

From the moment fibre optic cable enters the building, HellermannTyton's products come into their own. The S5 MDU enclosure will distribute any incoming fibre to the comms room or to multiple zones in the building. From the comms room, HellermannTyton has a number of copper and fibre solutions that can then be used to connect offices, active equipment and hardware to the outside world.



HellermannTyton manufactures a wide range of innovative solutions that are designed to provide connectivity to different zones within a building. Whether it's the new Zone Termination Box, an under the floor cable distribution box, a work area pod or a pre-terminated 'to the desk' solution, HellermannTyton has a product that can meet the network infrastructure demands of any intelligent building.

For more information **CLICK HERE.**

www.htdata.co.uk

Cable Management Warehouse (CMW)

CMW's occupancy and well building sensors are based on proven technology. They connect wirelessly via a gateway link to record an almost infinite range of data to a cloud based analytics platform.

Sensors register to the network within seconds of installation and can instantly record data on occupancy, humidity, temperature, air quality and a host of other measures. This makes it possible to identify areas where safe working occupancy limits are being breached, and instantly solve the problem with a sequence of alarms or notifications to those responsible for staff safety.

These sensors can be used as triggers to control a lighting scheme, monitor air quality, humidity, temperature, CO2 and noise levels. As such, they can adjust a range of building management system (BMS) components to optimise a working environment and ensure the wellbeing of occupants.

CLICK HERE to find out more or to send an email **CLICK HERE.**

cmwltd.co.uk

Theory of evolution

With remote working habits transforming the way we view and use workplaces, Mike Hook of LMG explains why buildings must be connected, intelligent and deliver real value

Smart buildings are increasingly at the centre of discussions about the future of the workplace, as they deliver positive and personalised experiences for the people working inside them, which, in turn improves their safety and wellbeing. In truly interactive and flexible smart buildings, these experiences have the potential to completely change our perception of the built environment and the places where we work.

HARD WORK

The question of where and how we work is one that is being asked more frequently than ever. From how safe and secure a building is to how well equipped it is to connect occupants with those working remotely, businesses are now taking a close look at how their workspaces can support occupants in the coming months and years.

For the vast majority of businesses, it is going to be necessary to encourage a reasonable level of in-person collaboration within the office. However, if landlords and business owners are to encourage people back to the office, once it's safe to do so, then they are going to have to work hard. Creating and delivering superior employee experiences will be absolutely critical to the success of these strategies.

APPETITE FOR CHANGE

Intelligent buildings have been firmly on the agenda of corporate real estate and facilities professionals for many years. Functions such as wayfinding systems, software to enable users to book and schedule space, and mobile access control have long been lauded for the added safety, security and efficiency they bring. The post-pandemic imperative to keep a careful eye on occupancy levels, space sharing and the whereabouts of employees will only accelerate the need to equip buildings with such features.

Research LMG carried out amongst business leaders to explore attitudes around corporate real estate showed that 60 per cent are reconsidering the role that their corporate buildings play in their businesses. Fuelled partly by the coronavirus pandemic and partly by the possibilities afforded by new technologies, almost half (49 per cent) said instead of relocating or acquiring new

office space they would look to transform their existing spaces and enhance them with smart features.

MAKING CONNECTIONS

Before delving into exactly what is possible in smart buildings, we must talk about connectivity. None of the features and services we associate with smart buildings are viable without a robust and flexible connectivity infrastructure in place to underpin them.

The need to ensure buildings are connected, intelligent and deliver value is escalating. Building this framework and ensuring it can support not only the technology and features of today, but is also able to adapt to the next three or four generations of upgrades, is (or certainly should be) the cornerstone of every business' real estate game plan.

RETURN ON INVESTMENT

While we take wired connections, and even Wi-Fi, for granted in buildings today, we cannot lose sight of the vital role it plays as the workspaces we build continue to evolve. Not only is connectivity crucial in providing the infrastructure and platform needed to facilitate a successful convergence of information and operational technology features in smart buildings, it also paves the way for personalised and compelling user experiences, harnessing all the data available and turning it into functional and smart features that are fully aligned with emerging standards such as those proposed by WiredScore's Smart Council and UL/TIA's SPIRE programme.

If you only listen to the hype about the benefits of the internet of things (IoT) and

the huge increases in the variety of sensors and other end point devices being added to a building's ecosystem, you might assume that everything is ticking along nicely. But the existence of these end point devices is only part of the picture. Unless connected devices have the infrastructure and support needed to function at a high level and over the long-term, customers will not reap the much promised rewards from their substantial smart building investments.

'Universal connectivity continues to be a vital prerequisite for enabling every aspect of the smart buildings vision. This doesn't just encompass the connectivity we have come to expect, but also includes bringing mobile 4G and 5G into buildings.'

SMART VISION

Universal connectivity continues to be a vital prerequisite for enabling every aspect of a smart building vision. This doesn't just encompass the connectivity we have come to expect, but also includes bringing mobile 4G and 5G into buildings.

Creating a reliable, robust backbone of connectivity – of every type – is critical if we are to be successful in using technology to establish compelling new standards for the built environment and engender new working cultures within organisations. For example, a 5G network will play a crucial role in realising the full benefits of IoT devices and systems. And, as previously mentioned, this infrastructure needs to be not only fit for current purposes but also strong and flexible enough to adapt to future revisions and upgrades.

However, creating this level of permanent connectivity is no easy task. Even a traditional ICT infrastructure fitout – involving wired and Wi-Fi connectivity – is a huge challenge on its own.

PARTS OF THE PROCESS

The process of deploying the physical infrastructure, the access points and the supporting systems is a massive undertaking – to say nothing of specifying and connecting the potentially tens of thousands of devices that will rely on these networks. The addition of mobile connectivity steps this challenge up a level, but is a vital hurdle to overcome, as today's businesses see it as huge priority when planning and fitting out their workspaces.

Without seamless access to 4G service and a plan for 5G future proofing, the connected experiences for employees and visitors are significantly compromised. When companies have invested heavily in enabling these experiences, the last thing

they need are connectivity issues derailing the entire process.

CONNECTIVITY AS A SERVICE

It's not just about getting the fundamental elements in place, as a connected network alone will not enable a building to be fully smart. Beyond the install, there is also a longer-term operational challenge that facilities and building professionals face.

What happens when an incident occurs, or a device fails? Building networks span a huge range of technologies and systems, and building managers often rely on a host of specialist contractors to deal with each system in isolation. But this siloed approach is ripe for mistakes and/or communication problems, resulting in unintended errors. When everything is built on one central platform, to really take advantage of the opportunities on offer you really need engineers and partners that understand the whole picture and how individual systems interact with each other.

In our research, we looked into what tools business leaders are looking to prioritise when they do decide to make enhancements to their current real estate. The data shows that businesses are placing significant value on measures and tools aimed at increasing and improving connectivity and unified communications – an encouraging sign that the message is getting through about needing the right infrastructure in place. Based on average scores out of 10, the following systems all ranked 8/10 – mobile/Wi-Fi connectivity, unified communications and access control systems.

NEXT STEPS

As we navigate the return to workspace and the increasing appetite for flexible working, such measures are becoming crucial for companies to oversee and manage who is where within their buildings. It's these real-life issues that are driving leaders to have conversations about smart buildings with a new sense of urgency. Quite frankly, unintelligent or dumb buildings are not an option as we face the next chapter in corporate real estate. Smart buildings are the way forward and, if the right steps are taken, they can deliver considerable benefits for the businesses and employees who use them. ■

MIKE HOOK

Mike Hook is executive director at LMG. Over a 30 year career he has acquired a unique combination of technical and business skills that enable him to convert technological innovation into valuable business outcomes. He works closely with property developers, owners, occupants and general contractors around the world to ensure they get full value from their investments through the intelligent use of smart building and ICT technology.

Equinix invests €32m to expand its data centres in Finland

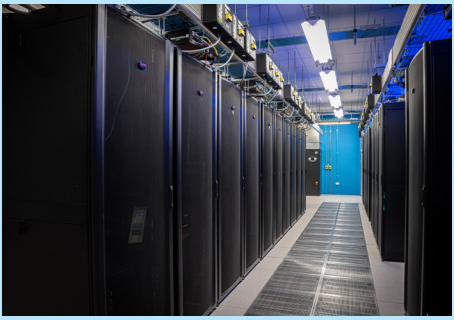
Equinix is continuing to invest in growing its data centre capacity in Finland. The company is expanding two of its International Business Exchange (IBX) sites – HE5 and HE7 – in Helsinki, with a €32m investment, boosting the capacity for further digitisation of local and international customers.

This investment is part of Equinix's continuing metro growth strategy in the Nordics region, with Finland being an ideal location to reach the 27 million consumers in the Nordics area. The expansion also utilises and further supports Finland's standing as a connectivity hub between Europe, the Baltics and Russia.

Finland is seeing a rapid increase in cloud adoption and deployment, with the hyperscale sector expected to grow to $17bn by 2025. Through Equinix's expanded data centre capacity, Finnish and Nordic customers further afield have increased access to Equinix Fabric, a global interconnection service.

EfficiencyIT secures contract to upgrade power infrastructure at Wellcome Sanger Institute

EfficiencyIT has secured a new contract with the Wellcome Sanger Institute, which will see it deploy more than 300 custom designed APC by Schneider Electric rack power distribution unit (PDU) metering systems at its on-premise data centre near Cambridge. This will deliver key insights into energy consumption and stranded capacity, while helping to lower operating expenses.

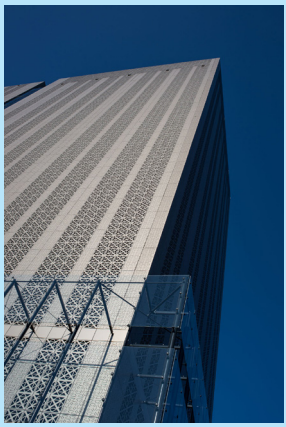


The Wellcome Sanger Institute conducts key research into life sciences, human disease and genomic sequencing. The sheer volume of data produced by its fleet of sequencing machines, and the speed at which it is generated, requires use of an on-premise data centre with vast storage, power and high performance computing (HPC) processing capabilities.

The upgrade continues the long-term partnership between the two organisations and will offer decision makers greater visibility into energy usage, while reducing power consumption to provide savings. The project will also benefit other key Wellcome Genome Campus partners, forming part of a wider digital transformation initiative.

Lenovo to power SURF supercomputer in the Netherlands

Lenovo Data Center Group (DCG) will deliver a high-performance computer infrastructure for SURF, the ICT cooperative for education and research in the Netherlands. The €20m project, which began in early 2021, will result in the creation of the largest and most powerful supercomputer in the country.



Supporting scientists from over 100 education and research institutions throughout the Netherlands, the supercomputer will power highly complex calculations in life enhancing work across all fields of science including meteorology, astrophysics, medical and social sciences, as well as materials and earth sciences. Lenovo's technology will include its ThinkSystem servers, powered by 2nd Gen AMD EPYC processors and ThinkSystem servers powered by future generation AMD EPYC processors.

While optimal performance is a necessity for the SURF Dutch national supercomputer, it is also vitally important to ensure the system is energy efficient. Lenovo's water-cooling technology will remove approximately 90 per cent of the heat from the system, reducing overall energy consumption, significantly increasing overall efficiency and allowing the processors to perform at their peak.

PROJECTS & CONTRACTS IN BRIEF

Vogel Telecom has deployed Brazil's first 800Gb/s network using Ciena's Waveserver 5 optical platform. The network in Sao Paulo will support customers in delivering high-quality cloud, edge computing, video streaming and gaming experiences.

Inverness' digital transformation has reached another milestone now that its first homes have connected to CityFibre's new gigabit capable full fibre network.

Robert Gordon University has deployed Nutanix Xi Frame to complement and extend its existing on-campus end user computing solution. This will support researchers in its schools of architecture and engineering, as well as students on the Scottish Graduate Apprenticeship (GA) scheme who are studying remotely whilst working.

Unite Private Networks (UPN) is offering a full suite of high-bandwidth Ethernet, IP, dark fibre and data transport services to customers at Stream Data Centers' DFW VII facility in Garland, Texas.

MLL Telecom has been awarded a seven year contract by The Kemnal Academies Trust (TKAT) to provide a high speed broadband services, as well as centrally managed firewall and content filtering.

Rittal

Baying enclosures are frequently employed for freestanding use cases but are not always the best approach. The advantages of standalone products such as the Rittal VX SE have often been overlooked. This represents a best of both worlds solution midway between Rittal AX compact enclosures and the VX25 baying portfolio.

VX SE offers even quicker time to delivery and faster, simpler assembly, greater safety and compatibility with other Rittal systems. The VX SE range also includes a 300mm deep version that is suitable for cramped environments.

The VX SE offers significant benefits compared to baying systems. It can be used in many areas of industry and in building services management. Typical fields of application are in compact machinery and equipment and their power distribution and automation components, which can be accommodated in a single enclosure.

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R&M

In the data centre segment, data growth is boosting demand for efficiencies in the areas of energy and operational management.

As the migration to 100Gb/s, 200Gb/s and 400Gb/s continues, further developments include enterprise data centres increasingly moving to the cloud and the rise of hyperscale data centres, as well as hybrid, edge and integrated data centre solutions that include racks, power cooling, monitoring and cabling.

To support all of this, more optical fibre cabling is required. However, according to a recent blog from Andreas Ruesseler, CMO of R&M, just adding fibre isn't enough. In order to optimise capacity and space usage, data centre infrastructure management (DCIM) and ultra-high density solutions will be absolutely necessary. Furthermore, to keep infrastructure manageable in the longer-term, intuitive user interfaces and artificial intelligence (AI) will be required.

CLICK HERE to read the blog.

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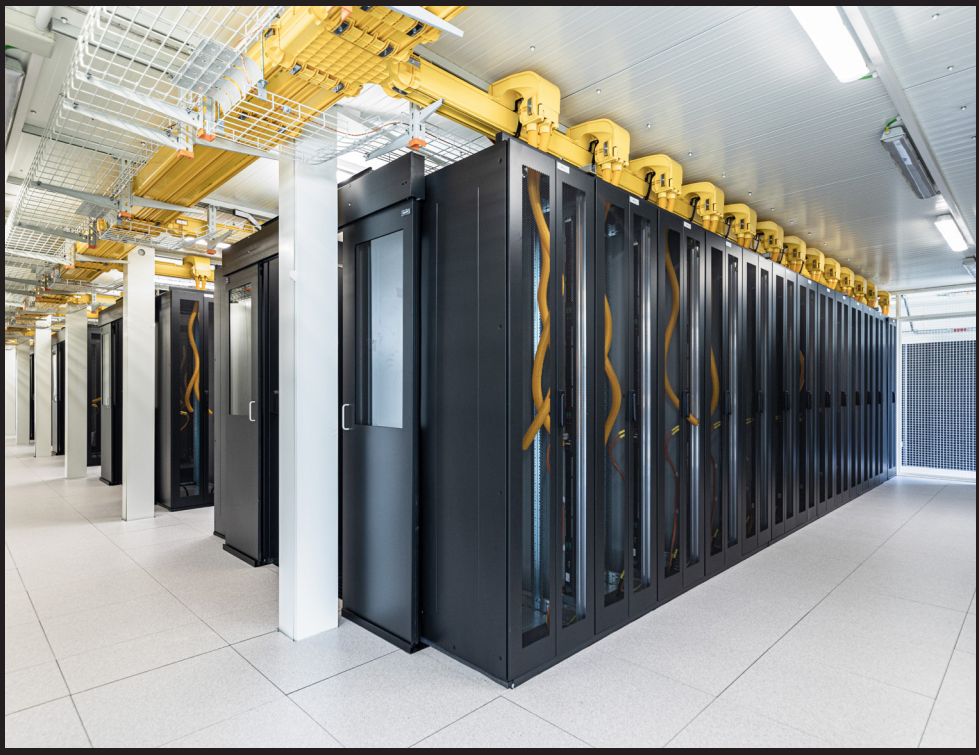
A flexible future

Kresimir Krpan of Vertiv explains why there is growing demand for prefabricated modular data centres that are fast to build, adaptable and often more cost effective than traditional facilities



Companies and consumers have an insatiable appetite for data. In the past decade cloud computing, big data technologies and entertainment streaming services such as Netflix and Spotify have caused an exponential rise in the data we consume, and the computing power needed to facilitate it. New technologies such as artificial intelligence (AI), self-driving cars and the rollout of 5G mobile phone networks will further increase the use of data.

MEETING POINT

To meet demand, data centres have been getting bigger and smaller.

Cloud computing companies have been building bigger colocation data centres, while the largest cloud platform providers have signed leases so large that they have altered data centre size by a factor of 10, according to a report from Cushman & Wakefield.

Five years ago, companies were deploying 10-20MW in a data centre. Now operators are talking about a campus with 100MW-

200MW. Conversely, there is also a trend for data centres to get smaller and be quicker to build. In the past few years there has been strong growth in modular edge data centres – small, prefabricated facilities that use modular designs for speed of construction.

This new type of data centre is often on the edge of the corporate network, for example, in a car park or on a rooftop. They are much faster to build – taking three to four months rather than a couple of years for a large data centre built using traditional methods. And they are usually closer to users, perhaps 40-60 miles away, rather than hundreds of miles away as traditional data centres often are.

READY TO DEPLOY

According to 451 Research, the market for prefabricated modular data centres is set to expand at a five year compound annual growth rate of 14.4 per cent through 2021, when it will be worth $4.4bn. I believe this market will exceed this forecast, partly because the coronavirus pandemic has boosted demand for prefabricated modular data centres.

Popular types of prefabricated modular data centres include all in one modules with integrated IT, power and cooling infrastructures, which are often used in education, industrial and healthcare sectors, as well as remote and harsh environments. Edge site deployments range from a 2MW facility in a city to a single, hardened rack next to a 5G mast on a building rooftop. Prefabricated modular data centres help organisations quickly add computing capacity and offer improved system integration, testing and commissioning.

‘Prefabricated modular data centres are assembled, integrated and tested in a factory environment to shorten deployment time and improve the predictability of both schedule and their cost to build. They are flexible, allowing for faster deployment and lower risk.’

TAKING ADVANTAGE

Prefabricated modular data centres have been around for about 15 years. Sun Microsystems introduced one of the first – based around a containerised design – in 2006. Within a few years, other large IT companies including Dell, IBM and HP followed suit. The IT industry is not the first industry to see the advantages of prefabricated facilities. Other sectors, such as pharmaceuticals and oil and gas, have used prefabricated modular buildings to accelerate constriction and house machinery to strict deadlines, often in difficult locations such as remote oilfields or offshore platforms.

Prefabricated modular data centres include two separate concepts that dovetail :

- Modularity refers to building and adding units of data centre capacity in blocks to meet growing need. This means less computer power is wasted and it's easier to meet surges in demand from customers.

- Prefabrication refers to the process of manufacturing and assembling units of capacity – rows, rooms, data halls, power and thermal infrastructure – off-site. It enables activities to move forward in parallel, which wouldn't be possible in a conventional on-site build.

SIZING IT UP

Prefabricated modular data centres are assembled, integrated and tested in a factory environment to shorten deployment time and improve the predictability of both schedule and their cost to build. They are flexible, allowing for faster deployment and lower risk. Other benefits include the ease at which they can be scaled – adding blocks of computer capacity fast to meet to unforeseen demand.

A prefabricated modular data centre can include thermal management, power protection and distribution, controls and management software, and fire protection and physical security. They can range from single server racks to larger multi-racks, and can even be assembled to become multi-storey buildings.

MODULAR BENEFITS

The additional benefits of prefabricated modular data centres include rapid and cost effective design, enhanced

standardisation and high-quality control during construction. Industry standards for the resilience and reliability of prefabricated modular data centres are set from the Uptime Institute Tier Certification of Constructed Facilities.

When designing and installing modular data centres, cost and time can be minimised if most of the construction is in a factory, rather than on a customer's premises. For small modular data centres, it's possible to rollout four to five units in just one week. Edge data centres are ideally suited to being run without engineers on-site and managed remotely, which can further cut costs. The pandemic has highlighted the importance of working remotely, as well as the key role that data centres play in keeping businesses running and people connected.

Prefabricated modular data centres are proving especially popular in developing economies, where rapid deployment is critical. However, there is a growing demand in developed markets as well – a large amount of traditional colocation sites use prefabricated building blocks such as power modules. Also, edge rollouts in developed markets can be done seamlessly with a prefabricated approach.

MORE POWER TO YOU

Latest technologies including AI and 5G mobile networks will require a lot more computing power. Traditional data centres, no matter how big they get, will struggle to cope with an ever growing use of data and prefabricated modular data centres can help shoulder the burden. The market is growing fast, as organisations are attracted by their lower cost and far speedier construction, plus the ease at which computing power can quickly be added to meet spikes in demand. In time, they may even become the default for new data centres. ■

KRESIMIR KRPAN

Kresimir Krpan is sales director for Vertiv's integrated modular solutions for data centres, telecom facilities and industrial projects across Europe, Middle East and Africa. He has 15 years of experience with the design and deployment of more than 100 prefabricated modular data centres and critical facilities in EMEA, as well as other regions such as Australia and Brazil.

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