

One thing le to another

HOW THE IOT IS CHANGING
DATA CENTRE DESIGN
AND OPERATION



Model behaviour

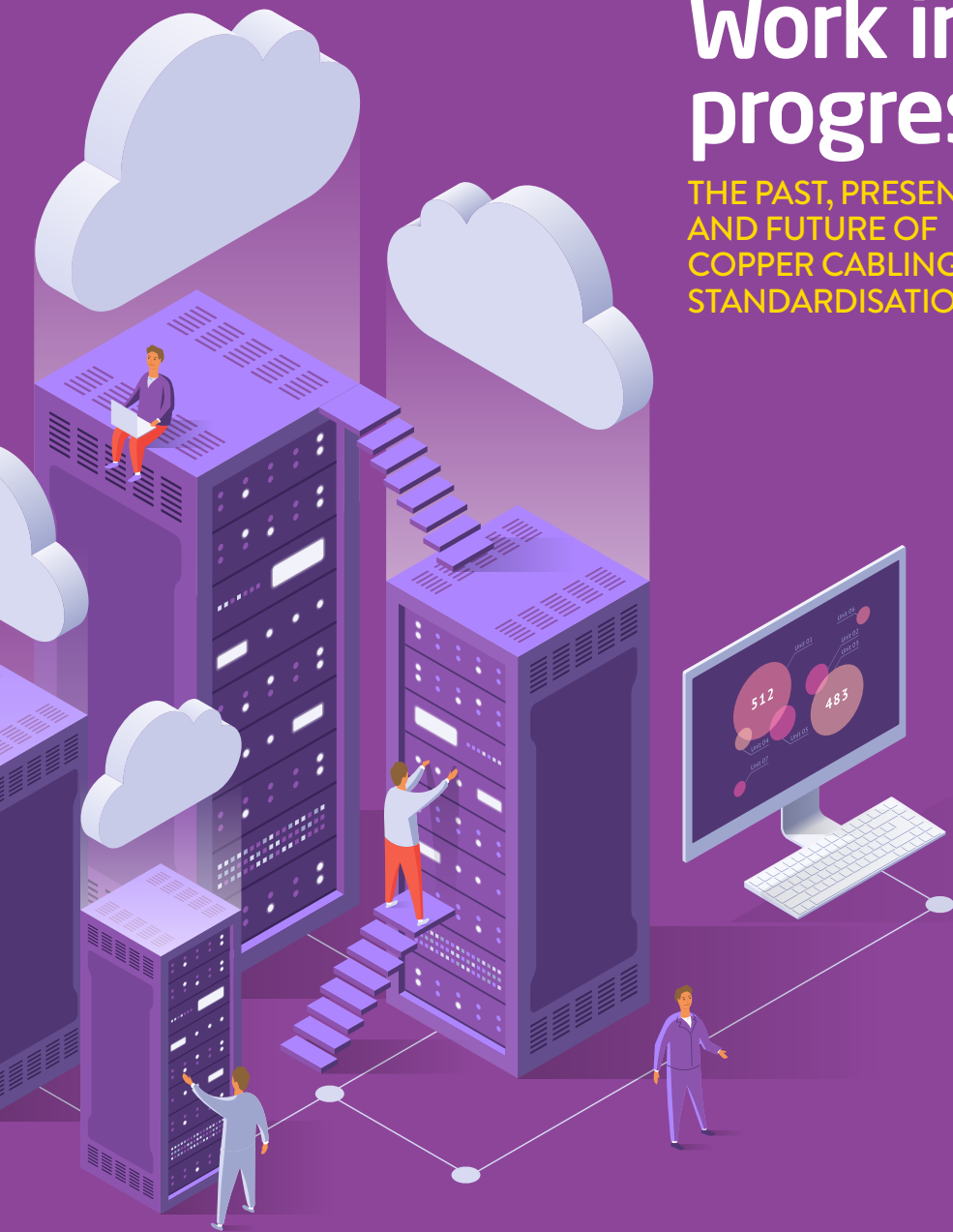
MANAGING ENERGY
PERFORMANCE IN THESE
CHALLENGING TIMES

Inside Networks

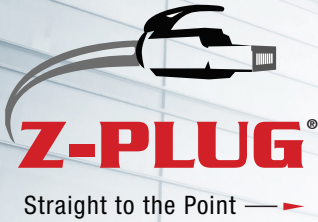
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Positive steps

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As countries around the world begin to ease lockdown restrictions and people slowly return to work, the 'new normal' is starting to emerge. It's clear that the data centre and enterprise network infrastructure sector is poised to play a pivotal role and is doing so with positivity and determination. These qualities have been evident in the many conversations I've had over the last few weeks, and it speaks volumes about this sector and the people who work in it.

In addition to the unwelcome effect of coronavirus, data centre owners and managers are also faced with the implications of the internet of things (IoT) when designing and operating their facilities. In this issue we've asked a panel of experts to explain the measures that should be in place to deal with data traffic of this magnitude, and how to manage capacity and address security challenges. You can read their responses by [CLICKING HERE](#).

The death of copper cabling is a recurring industry theme, but on every occasion it is greatly exaggerated. In fact, copper cabling appears to be in rude health and to prove the point we have two excellent articles on this subject. In the first, Todd Harpel of Nexans examines the past, present and future of copper cabling standardisation, while in the second, Zoran Borcic of Draka/Prysmian looks at the growing popularity of power over Ethernet (PoE). [CLICK HERE](#) to read Todd's article and for Zoran's [CLICK HERE](#).

We also have a special feature dedicated to energy management. Stu Redshaw of EkkoSense looks at how to manage data centre energy performance in these challenging times, while Mike Elms of Centiel UK explains why, when it comes to uninterruptible power supplies (UPS), achieving 100 per cent uptime must be the primary goal. You can [CLICK HERE](#) to read Stu's article and [CLICK HERE](#) to read Mike's.

With much more besides I hope you enjoy this issue of Inside_Networks. Stay safe and look after each other.

Rob Shepherd

Editor



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Post coronavirus fallout could see data centre operators allocating greater resources to training and development

The fallout from coronavirus will push data centre operators to think more innovatively, particularly when it comes to reviewing how internal management and maintenance practices are carried out across the data centre floor. This is according to Chris Burden, chief commercial officer at Memset, who suggests social distancing measures within facilities could be here for some time and upskilling staff to take on more responsibilities could provide a more flexible data centre workforce.

He said, 'The first order of business will be a review of all business continuity planning practices. All facilities should have up to date plans in place, which are



frequently tested against things such as outages, flooding and other forms of natural disaster. Getting suppliers into a facility may become much more controlled,

meaning data centre management teams will need to think more strategically to how they can get more out of their on-site staff.'

Management will need to put in place plans to manage this on a long-term basis

and Burden added, 'One option could be to upskill staff to take on more responsibility when it comes to the maintenance and management of its facilities. I will not be surprised to see operators allocating greater resources to training and development to support this.'

Databarracks claims organisations lacked pandemic preparation

Research from Databarracks has revealed 66 per cent of organisations had no plans in place for responding to an infectious disease pandemic before the coronavirus outbreak. The findings were taken from Databarracks' Data Health Check survey, which questioned 400 IT decision makers in the UK on a number of critical issues relating to security, disaster recovery and business continuity.

Peter Groucutt, managing director at Databarracks, said, 'For years, pandemics have been consistently at the top of both national and community risk registers as the hazard with the



highest potential impact and likelihood of occurring. However, the coronavirus outbreak caught the majority of businesses off-guard.'

Groucutt believes that organisations can learn some valuable lessons from the crisis and added, 'Cognitive biases mean we focus more on the types of incidents that have happened to us recently, rather than those that are most likely to occur. This is why we always recommend

using national and community risk registers in planning. They won't always be a perfect fit, but they serve as excellent sanity checks to make sure you aren't missing something.'

Manufacturing most attacked industry as cybercriminals continue to innovate and automate attacks

Cybercriminals are evolving and increasingly automating their attacks, according to the 2020 Global Threat Intelligence Report (GTIR) from NTT. In the UK and Ireland manufacturing became the most attacked sector, representing almost a third of all attacks, while technology was the most attacked sector globally. The GTIR also highlights the importance of cyber-resilience and security by design, as cybercriminals look to gain from the coronavirus pandemic.

The GTIR reveals that threat actors are innovating faster than ever before. Developing multifunction attack tools and using AI and ML capabilities, attackers are

investing in automation techniques – 21 per cent of attacks globally were in the form of a vulnerability scanner. Despite efforts to layer up their defences, many organisations are unable to stay ahead of attackers, while others are struggling to do the basics like patching old vulnerabilities.

Rory Duncan, security go to market leader at NTT, commented, ‘Manufacturing has become a major target for attackers in recent years, as a result of the increased risks brought about from

the convergence of information and operational technologies. The biggest worry is that security has lagged behind in this sector, potentially exposing systems and processes to attack.’

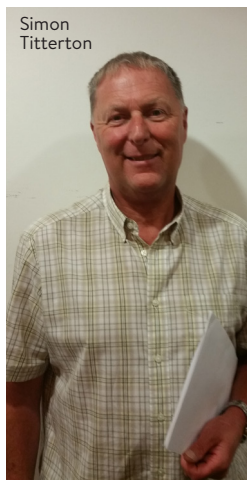


Rory
Duncan

Trinity DC acquires Optimum Data Centres

Trinity DC has acquired Optimum Data Centres (ODC) and is the new multi-tenant data centre operator for the former ODC site in Hayes – now named Trinity London. As a key part of the acquisition, Trinity DC has taken on all of the ODC staff to ensure a seamless transition for clients, partners and suppliers.

Trinity DC is providing significant investment to Trinity London through a multi-stage refurbishment plan in order to facilitate additional clients.



Simon
Titterton

‘We are delighted about the acquisition,’ said Simon Titterton, colocation services director at Trinity DC. ‘Our refurbishment plans for the Hayes site are really exciting and the team is looking forward to enabling the Trinity London data centre to realise its full potential.’

Trinity London boasts 38,000ft² of technical space, much of which is currently vacant. The site is well connected with 11 key carriers present and is conveniently located within the M25 close to Heathrow Airport and with unrivalled road and rail links.

CNet Training reopens Network Infrastructure Centres in the UK

CNet Training has reopened its Network Infrastructure Centres in the UK to deliver classroom based network infrastructure education. Social distancing measures will be in place at all times and class sizes have also been reduced.

Each learner will have a dedicated workspace and be issued a set of personal tools and equipment. These will be thoroughly sanitised after every class, while each facility will be professionally deep cleaned. They will also receive a set of PPE before every class, consisting of disposable gloves, safety glasses, hand sanitiser, anti-bacterial wipes, facemasks and disposable aprons.



Andrew Stevens

Learners will be required to use the PPE for the duration of the program and follow standard safety measures including regularly sanitising and washing hands.

Andrew Stevens, CEO at CNet Training, said, 'The safety of our learners and instructors is of paramount importance, and we have taken every precaution to ensure they can feel safe within the classroom environment. Our aim is for everyone in the classroom to be able to focus on learning and education without the need to worry about safety measures. We will continue to monitor and review the government's advice closely, making additional adjustments as needed.'

Inside Networks

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The event will ask for 4-ball teams to compete in a 'best 2 from 4' full handicap Stableford competition over 18 holes (with a 2-tee start from 10:30am).

Live Scoring sponsorship is available.

Golf will be preceded by tea, coffee and bacon rolls at registration and will be followed by a 3-course private dinner and prize giving with charity raffle.

There will also be opportunities for sponsorship of all aspects of the day – all raising money for Macmillan Cancer Support – since 2005 this industry event has raised over £78,500 through our charity golf events!

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Indoor Simulator Competition

The cost of a 4-ball team will be £595 (+VAT).

There will also be discounted accommodation at Hanbury Manor Hotel & Country Club, which will include breakfast and use of the extensive leisure facilities. Price to be confirmed.

As in previous years – teams will be asked to provide a raffle/auction prize on the day in support of the charity.

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High-speed data centre Ethernet adaptor market tops \$1bn for the first time in 2019

The market for Ethernet adaptors with speeds of 25Gb/s and faster deployed by enterprises, cloud service providers and telecommunication network providers at data centres topped \$1bn for the first time in 2019, according to Omdia.

The total Ethernet adaptor market size stood at \$1.7bn for the year. This result was in line with Omdia's long-term server and storage connectivity forecast. Factors driving that forecast include the growth in data sets such as those computed by analytics algorithms looking for patterns, and the adoption of new software

technologies like artificial intelligence (AI) and machine learning (ML), which are driving larger movement of data.

'Server virtualisation and containerisation reached new highs in 2019 and drove up server utilisation,' said Vlad Galabov, principal analyst for data centre IT at Omdia. 'This increased server connectivity bandwidth requirements, and the need for higher speed Ethernet adaptors. The popularisation of data intensive workloads, like analytics and AI, were also strong drivers for higher speed adaptors in 2019.'

Businesses sleepwalking into IT crisis when lockdown eases

IT professionals are the key workers that have largely gone under the radar since the coronavirus pandemic.

However, figures published by Core have revealed that 29 per cent are now finding their jobs 'too stressful', while 71 per cent are getting less than two hours a day of 'genuine downtime'. This is having a direct impact on the amount of sleep they are getting, with 74 per cent getting less than the recommended 7-8 hours' sleep on weeknights.

The knock-on effects could incredibly damaging – if staff are running on empty, they are more likely to be unhappy, less motivated, unproductive and,

more concerningly, prone to errors. Any mistake, whether it is unintended or not,

could leave businesses vulnerable to a range of threats.

Stuart Dickinson, COO at eacs, commented, 'One of the biggest burdens facing IT teams is the burden of legacy technologies, with the report showing a clear link between the wellbeing of staff and the amount of time they spend on keeping the lights on across outdated environments. The role that managed services could play here cannot be overstated, as finding the right partner can take the pressure off overworked IT teams.'



COVID-19
LOCKDOWN COVID-19 EPIDEMIC

R&M and partners launch Single Pair Ethernet System Alliance

R&M recently participated in founding the Single Pair Ethernet (SPE) System Alliance with Phoenix Contact, Weidmüller, Fluke Networks and Telegärtner. These companies are now bundling and exchanging SPE expertise and knowledge in a targeted manner.

The SPE System Alliance's main goal is to drive development of SPE for industrial internet of things (IIoT) and collaborate on related technological challenges. It aims to accelerate development of SPE technology, ensuring it can be implemented in products faster and more reliably. Datwyler, Kyland, Microchip Technology, Rosenberger, SICK, O-Ring, Draka/Prysmian and University4Industry

have since joined the SPE System Alliance and the breadth of this line-up means it covers a wide range of industries and applications.

Matthias Gerber, market manager office cabling at R&M, commented, 'Implementation of SPE is always a lengthy process and a complete working system must be available to ensure end user acceptance. Providing everything required would be a huge task for one company and probably not feasible. The SPE System Alliance provides the platform for companies from different fields to develop a working system together – reducing risk for each company.'

Multiple network outages costing enterprises millions of pounds a year

More than half of senior IT decision makers and network managers globally say they have had four or more network outages lasting more than 30 minutes in the past year alone, with outages costing between £250,000 and £5m in downtime, according to a recent study by Opengear. More specifically, nearly a third of these organisations (31 per cent) said network outages had cost their businesses over £1m over the past 12 months.

Measuring the True Cost of Network Outages questioned 500 global senior IT decision makers and discovered that for nearly half of respondents (49 per cent), improving network resilience was the top

priority of their IT department, while a further 33 per cent revealed it was in their top three priorities.

Steve Cummins, vice president of marketing at Opengear, said, 'The true

cost of a network outage is much more than just lost revenue. Our survey found that reduced customer satisfaction was the biggest impact of an outage according to 41 per cent of respondents, ahead



of data loss (34 per cent) and financial loss (31 per cent). Organisations need to think in advance about how they can avoid, and then recover from, an outage quickly before the consequences become severe.'

Almost half of organisations have been reported to the ICO for a potential data breach

Apricorn's annual survey into the attitudes towards data breaches found that almost half (43 per cent) of surveyed IT decision makers said that their organisation has been reported to the Information Commissioner's Office (ICO) since the General Data Protection Regulation (GDPR) came into effect.

25 per cent said they had notified the ICO of a breach or potential breach within their organisation, whilst 21 per cent have had a breach or potential breach reported by someone else. Over 160,000 breach notifications have been made to data



supervisory authorities in the European Economic Area (EEA) since GDPR came into play, according to a data breach survey carried out by DLA Piper, up to the end of January 2020.

'The fact that so many businesses are now choosing to notify of a potential breach is positive, but likely precautionary to avoid falling foul of the requirements and any significant financial or

reputational ramifications,' commented Jon Fielding, managing director EMEA at Apricorn. 'Being able to establish a cause and remediate quickly will put businesses in good stead for breach recovery.'

NEWS IN BRIEF

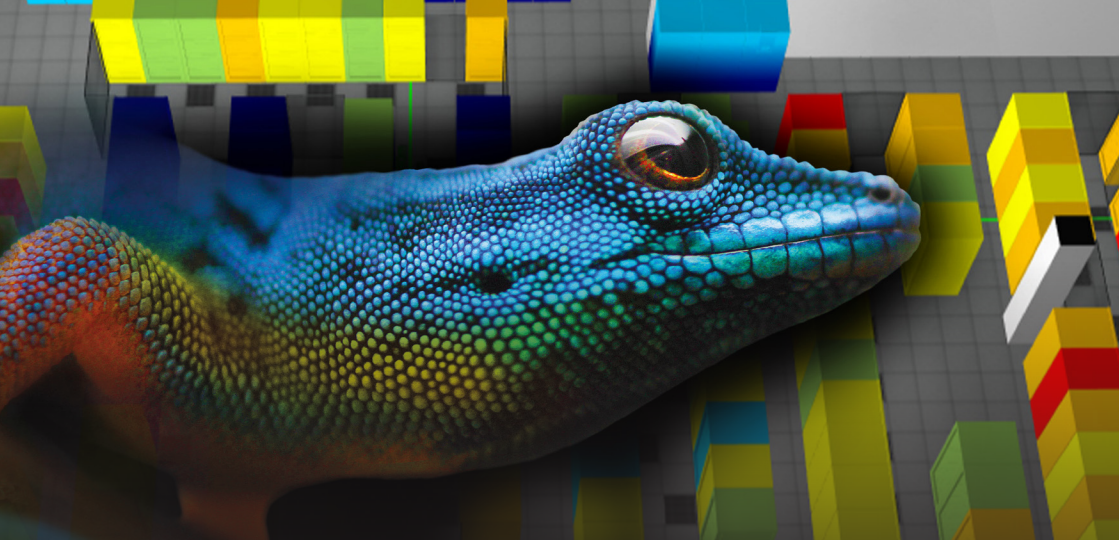
Gary Worrall is the new president of the Electrical Contractors' Association (ECA). Worrall took over from Jim Pridham, who played a key role during the past 12 months, most notably through his promotion of industry training and apprenticeships.

63 per cent of IT workers want more home working opportunities once lockdown is over, with the lack of commuting the main reason for wanting to do so, according to research conducted by Hitachi Capital UK. It examines IT workers' feelings towards working from home during the pandemic, as well as their attitudes towards their environmental impact and how this has changed due to lockdown.

Rackspace has been positioned by Gartner as a leader in its 2020 Magic Quadrant for Public Cloud Infrastructure Professional and Managed Services, Worldwide.

Huawei has announced a new five-year collaboration with Imperial College London, aimed at growing the UK's data science and innovation ecosystem.

DigiCert has named Jason Sabin as its chief technology officer.



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The shape of things to

Hi Rob

The current global situation has necessitated a sudden and dramatic change in the way businesses operate. As well as a cultural and mindset shift, this has required IT teams to optimise their organisations' networks and IT infrastructures like never before. Whilst business has managed to successfully jump over the first hurdle, thanks to a Herculean effort by IT effort allowing employees to work remotely, this rapidly shifting network infrastructure is only one aspect of the challenge the 'new tomorrow' will bring.

As the economy begins to restart following weeks of lockdown, all focus will be on regrowth, agility and particularly on operational efficiency. Purse strings won't be loosening anytime soon. This means IT teams need to do more with less by optimising the tools and team capacity that they have available, without losing the agility to rapidly absorb further upcoming changes to their infrastructures.

In order to achieve this, maximising visibility of all data in motion must be the priority, as this will give teams an uninterrupted view of everything on their network – physical, virtual and cloud applications. Without this clarity, it is easy to flood network and security tools with irrelevant traffic, compromise tool effectiveness by providing incomplete visibility and increase manual tasks through redundant alerts – none of which organisations can afford at this time.

With complete visibility, IT can send precisely the right traffic to the right tool – nothing more, nothing less. Low risk, irrelevant and duplicate traffic can be filtered out, thus instantly freeing up bandwidth from current tool investment and allowing for a stronger security focus on more high risk apps. Depending on an IT organisation's tools and team structure, return on investment in visibility tools is almost immediate.

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Businesses shouldn't forget about their most valuable asset during these challenging circumstances – their people. Even before the pandemic, 85 per cent of organisations reported not having enough skilled IT personnel. With furloughing and reduced hours now common, this figure is sure to be higher.

Clear network visibility brings a number of benefits to IT teams. First, working with a reduced volume of traffic is simply easier – fewer and more reliable alerts, and the right data at hand for faster network and application troubleshooting. Tools can also be put in place to automate certain manual and repetitive processes, which will allow the IT team to spend their time on more important and fulfilling tasks. While this will provide a boost to productivity, its effect on team morale also shouldn't be forgotten.

Businesses are relying on IT more than ever. The first phase was to turn their

network 'inside out' to support a remote workforce. As we enter the next phase of working with tightening budgets, network visibility becomes crucial to running a lean operation but still maintaining infrastructure agility.

Bassam Khan
Gigamon

Editor's comment

Dealing with the impact of the coronavirus pandemic has required IT teams to become more flexible and responsive as they encounter new challenges. Given the sheer volume of people now working from home, it's fair to suggest that they have tackled these challenges head-on, with no small amount of success. However, Bassam is right to state that this is just the beginning and IT professionals will need all the tools at their disposal to continue to optimise their network infrastructures.

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Good thing going

The rapid expansion of the internet of things (IoT) has obvious implications for the way that data centres are designed and operated. [Inside_Networks](#) has assembled a panel of industry experts to discuss how these facilities can manage capacity


 Kevin Ashton of the Auto-ID Center is said to have come up with the term IoT during a presentation he made at Procter & Gamble (P&G) in 1999. Since then it has turned from just another industry buzzphrase to a ubiquitous term for our connected world and each week new and exciting internet connected devices are being introduced.

According to McKinsey Global Institute 127 new IoT devices connect to the internet every second, while Bain & Company predicts the combined markets of the IoT will grow to about \$520bn in

2021. That's a lot of information, which will have to be moved, processed and stored in data centres and means that the IoT is transforming the way these facilities are designed, built and used.

Inside_Networks has assembled a panel of experts to explain how the data centre sector is dealing with traffic on this scale and what measures should be in place to manage capacity and address security challenges.

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



WITH IOT DRIVING THE NEED FOR MORE BANDWIDTH AND INCREASED TRANSMISSION SPEEDS IN DATA CENTRES, HOW IS IT TRANSFORMING THE WAY THAT THEY ARE DESIGNED AND OPERATED. WHAT MEASURES SHOULD OWNERS AND MANAGERS HAVE IN PLACE TO DEAL WITH TRAFFIC OF THIS MAGNITUDE, MANAGE CAPACITY AND ADDRESS SECURITY CHALLENGES?

NANCY NOVAK

CHIEF INNOVATION OFFICER AT COMPASS DATACENTERS

As recent events have reinforced, the impact of any action often extends far beyond the scope of its immediate purpose. The growth of IoT implementations is like this – in a good way.

While still largely still business focused, large scale penetration of the consumer marketplace isn't far away. In other words, your refrigerator will be telling you to pick up some Diet Coke on the way home in a few years. Whether it's counting incoming inventory or crafting your grocery list, the one common theme underlying IoT is the high volumes of data generated that will need to be processed and stored – thereby having a substantial impact on data centres.

The explosion of data associated with IoT ensures the continual need for new data centres for the foreseeable future. Capacity planning – always more art than science – will need to improve in an increasingly accelerated environment. Rigid trigger driven thresholds will become increasingly prevalent to enhance planning precision, along with more extensive contingency considerations to identify the locations for new capacity faster, and more efficiently, than is the case for many organisations today. For providers, the by-product of the combination of escalating demand and more effective capacity planning will be the ongoing need to incorporate technology and new construction methodologies into existing processes to address compressed delivery schedules.

Since every device that can be added

within an IoT environment is a potential point of entry for hackers, data centre managers and operators will be under

increased pressure to ensure data security. In many instances enhanced security will be driven by continued advancements in artificial intelligence (AI) enabled devices and software governed networks to interpret hostile intervention attempts and automatically take the necessary corrective action.

Every innovation creates both opportunities and

requirements. The ability to accurately track virtually anything offers real benefits to both the corporate and consumer sectors, while forcing data centre managers and operators to implement new solutions and refine old ones. However, as IoT illustrates, enhanced capabilities and more effective modes of operation needn't be mutually exclusive.



'THE EXPLOSION OF DATA ASSOCIATED WITH IOT ENSURES THE CONTINUAL NEED FOR NEW DATA CENTRES FOR THE FORESEEABLE FUTURE. CAPACITY PLANNING – ALWAYS MORE ART THAN SCIENCE – WILL NEED TO IMPROVE IN AN INCREASINGLY ACCELERATED ENVIRONMENT.'

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TECHNICAL PRE-SALES MANAGER AT EXCEL NETWORKING SOLUTIONS

The way we view our buildings due to the IoT has dramatically changed and will continue to do so. There have been two studies published in the last 18 months that back this up. The first, related to power over Ethernet (PoE) enabled devices, forecasts the market growing by over 19 per cent and achieving sales in excess of \$1bn in 2021. The second more recent survey estimated there will be 36 billion IoT connected devices by 2021, reaching 75.5 billion by 2025.

With all these devices potentially capturing data, the way that information is being stored and used is becoming critical. It is not just the threat of cyberattacks we need to be concerned about, it's also the physical security of the infrastructure that is under threat.

Standards bodies have not been slow to react. CENELEC published EN 50600-2-5:2016 Information technology – data centre facilities and infrastructures – security systems. ISO/IEC 22237-6, based on the content of the CENELEC standard, was published in 2018. In parallel to this activity in 2016 the ANSI/TIA- 5017: Telecommunications Physical Network Security Standard was published. This doesn't just look at data centres – it covers the whole physical infrastructure.

There are several key differences between the CENELEC/ISO and ANSI/TIA standards. Therefore, in 2018 ISO/IEC JTC1/SC25/WG3 agreed to come up with

an international version of the latter, and the committee draft of ISO/IEC CD 24383 was published in 2019. It is now out for final comment.

ANSI/TIA-5017 has three security levels in relation to practices. ISO/IEC TS 22237-6, on the other hand, has four protection classes with more detail. Hence, an

alternative approach, which brings the two standards closer together and avoids vague statements of risk and solutions, has been taken to adopt three security classes

with more clarity in ISO/IEC CD 24383.

Continued collaboration is being given more emphasis to maintain and update the standard, as 5G and IoT continue to accelerate their deployments. With all the hard work that has gone into developing standards it is important that not just data centre operators are aware of them, but all infrastructure managers.



'THE WAY THAT INFORMATION IS BEING STORED AND USED IS BECOMING CRITICAL. IT IS NOT JUST THE THREAT OF CYBERATTACKS WE NEED TO BE CONCERNED ABOUT, IT'S ALSO THE PHYSICAL SECURITY OF THE INFRASTRUCTURE THAT IS UNDER THREAT.'

NICLAS SANFRIDSSON

CEO AT COLT DATA CENTRE SERVICES

IoT adoption is expanding at an incredible rate, with Gartner predicting that there will be as many as 5.8 billion enterprise and automotive endpoints by the end of 2020. With adoption rates only set to increase as we look further ahead, it is safe to say that the demands placed on data centre operators will grow exponentially.

In the data centre sector we are seeing customers requiring increased degrees of capacity, bandwidth and connection speed for their mission critical IT applications. So, as operators, we can no longer afford to just think about current customer requirements – we also need to be building for their future needs. Facilities need to be designed with the capability to rapidly scale-up and meet future customer demand. Operators that fail to incorporate scalability into their product roadmaps risk falling behind and potentially losing customers to service providers that are better suited to their needs.

From a design and operations perspective, this means data centre facilities need to be able to increase capacity, while also ensuring they are operating at peak efficiency at all times. Infrastructure upgrades are but one piece of the puzzle. Operators must also ensure the correct management and security protocols are in place to ensure a facility can cope with

the increased load. This means increased staffing and enhanced management systems to proactively anticipate and diagnose infrastructure and network issues to avoid damaging downtime.

It is critical that operators do not to let security fall to the wayside as customer demand increases. Leveraging automation and AI powered solutions can be key in helping ensure data centre services are protected. Physical and cybersecurity systems need to be regularly tested to ensure they can keep up with growth in

facility size and data traffic.

Preparing now for the inevitable boom in IoT adoption is the only way data centre operators can keep pace with the everchanging business landscape.



'FACILITIES NEED TO BE DESIGNED WITH THE CAPABILITY TO RAPIDLY SCALE UP AND MEET FUTURE CUSTOMER DEMAND. OPERATORS THAT FAIL TO INCORPORATE SCALABILITY INTO THEIR PRODUCT ROADMAPS RISK FALLING BEHIND AND POTENTIALLY LOSING CUSTOMERS TO SERVICE PROVIDERS THAT ARE BETTER SUITED TO THEIR NEEDS.'

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BRINGS ENERGY TO LIFE

JOHN SHUMAN

GLOBAL PRODUCT MANAGER DATA CENTRE AND TELECOM AT PRYSMIAN/DRAKA

The growing area of data creation and processing is causing the data centre sector to address the need for networks to be able to handle the ongoing requirement for bandwidth. Just as importantly, this bandwidth needs to be increased between both ends.

In today's data centres, operators are faced with how to increase the amount of optical fibre needed to support the networks required to process a data tsunami. With the adoption of 100Gb/s through 400Gb/s networks, the fibre increases also needed are enormous and require space. This requirement is not only in cables and where to put them but also rack and panel space to allow the increase in port availability.

Using micro distribution cables with increased fibre counts, but with small diameters and high density MPO connectors, is a good way to maximise increased density in legacy cable space such as conduits, cable trays and ducts. This approach allows for much smaller diameter cables over the larger legacy cables of the same or similar strand counts that require 50 per cent or less in space. So, two or even three times as many strands can be added

to the same space over legacy.

With the introduction of 200um fibre over the traditional 250um fibre these space savings and increased densities will continue. Also utilising connectors that allow for 8, 16, 24 lanes (strands) in the same connector also reduce needed space in racks and panels when terminating these cables to distribution and network

elements.

This explosion in data is not only related to IoT but also machine-to-machine, AI, virtual reality and other emerging data intensive technologies. Therefore, the need for data centres to grow in capacity will continue.



'IN TODAY'S DATA CENTRES, OPERATORS ARE FACED WITH HOW TO INCREASE THE AMOUNT OF OPTICAL FIBRE NEEDED TO SUPPORT THE NETWORKS REQUIRED TO PROCESS A DATA TSUNAMI. WITH THE ADOPTION OF 100GB/S THROUGH 400GB/S NETWORKS, THE FIBRE INCREASES ALSO NEEDED ARE ENORMOUS AND REQUIRE SPACE.'

MICHAEL WINTERSON

MANAGING DIRECTOR EMEA AT EQUINIX

While we are increasingly seeing IoT devices deployed in cities and factories to make them smarter through the automation of everyday processes, we haven't yet seen the full potential of this technology.

5G's ultra-low latency – expected to be around one millisecond – should be the catalyst to bring IoT technology into the mainstream. It will enable the machine-to-machine connectivity necessary to transfer huge amounts of data that can be analysed for actionable insights. It will also provide increased support for the development of new business applications that will have the ability to transform whole industries.

However, such innovation produces unprecedented amounts of data, as consumers and enterprises alike take advantage of the increased bandwidth. This significant growth in data will create problems for legacy IT infrastructures, which will struggle to transport and process it effectively, leading to network choke points and sluggish download speeds.

The industry will have to examine how its data centres are designed and operated, focusing on the control and flexibility of software defined interconnection (SDI) offered by colocation data centres. This technology will be instrumental in providing the vital data capacity needed in real time.

By 2021, Cisco estimates the creation of useful data will outstrip data centre network traffic capacity by a factor of 4:1.

This will increase the shift from centralised to distributed IT architectures at the edge. These infrastructures must be able to support the sophisticated applications of new technology and a wide variety of

new use cases, be it for factory production lines, smart cities filled with autonomous cars or servers running deep learning platforms for advancements in medicine and science.

The explosion in IoT will be dependent on data centres enabling enterprises to increase their reach in a cost effective

manner. They will be vital to the global economy, being the hubs through which the world's most valuable information will pass – keeping the digital economy and critical ecosystems operational and unlocking new opportunities for organisations worldwide.



'THE EXPLOSION IN IOT WILL BE DEPENDENT ON DATA CENTRES ENABLING ENTERPRISES TO INCREASE THEIR REACH IN A COST EFFECTIVE MANNER. THEY WILL BE VITAL TO THE GLOBAL ECONOMY, BEING THE HUBS THROUGH WHICH THE WORLD'S MOST VALUABLE INFORMATION WILL PASS.'



NEW

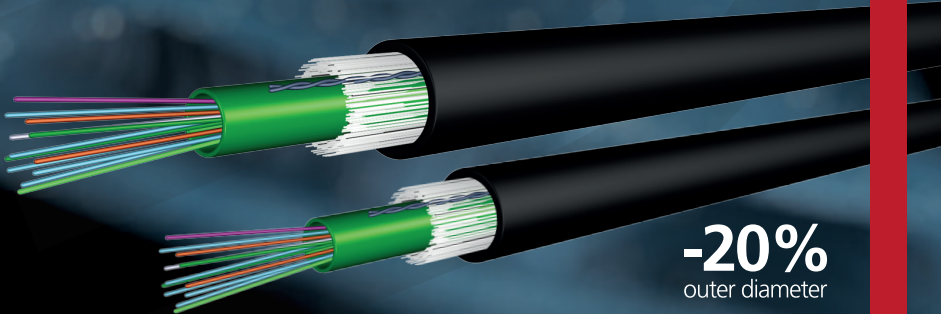
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THE NEW HIGH-DENSITY JACK AND PANEL SERIES PROVIDES:

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- New cable termination process that is easier and faster for Category 6a and 6
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- Flexibility by combining copper and fibre in the same panel

CHRIS FOLKERD

DIRECTOR OF ENTERPRISE TECHNOLOGY AT UKFAST

It's important for data centre operators to have the analytics in place to understand the traffic flows coming in, not only from a performance perspective to ensure customers have a consistent experience, but also to spot any malicious actors. The more traffic you have coming in, the more difficult it potentially becomes to spot a malicious package that's causing damage.

Bandwidth is a key consideration. IoT devices by themselves aren't necessarily bandwidth intensive, with many being sensors transmitting small pieces of information very frequently, or ambient devices like Amazon's Alexa that pull minimal information. But with IoT becoming more prevalent, hundreds of thousands of small data feeds quickly add up to a really significant total. You need to understand the scale of the devices you're working with and the bandwidth they consume.

Packets per second is a metric that is often overlooked. Managing IoT is not just about the bandwidth – it's about the sheer number of packets you're dealing with. The more devices you have connected, the more packets the network will have to be capable of dealing with, and operators need to design architecture with packets per second in mind.

As more of us transition to working from home on multiple devices, IoT service providers need to look at data transmission to their data centres and ask themselves

if they are transmitting only essential information, or if there's a lot of extraneous data that's wasting bandwidth.

The prediction of load on the platform is important too, which comes back to analytics. If you're hosting IoT business devices that monitor machinery, for example, they are likely to be running 24/7. If it's a platform for personal devices, usage may peak more heavily in the evening. Having an understanding of usage and a level of monitoring across your network will help you to better allocate your resources.

When it comes to security concerns for data centre operators, it boils down to the overall data centre architecture and maintaining stringent security measures as standard, including segmenting and isolating customer solutions and monitoring network activity, rather than being overly concerned about the nature of the IoT devices connected to it.

Ultimately, IoT vendors should build their networks on hosting platforms that employ best practice security and have the capability to burst into additional resource when required.



'PACKETS PER SECOND IS A METRIC THAT IS OFTEN OVERLOOKED. MANAGING IOT IS NOT JUST ABOUT THE BANDWIDTH – IT'S ABOUT THE SHEER NUMBER OF PACKETS YOU'RE DEALING WITH.'

Bringing you up to speed

Todd Harpel of Nexans examines the past, present and future of copper cabling standardisation

▶ Over the years, network cabling has steadily progressed from disparate proprietary systems to standardised, universal structured cabling. As information and communication technologies (ICT) have evolved, network protocols have predominately consolidated on to a common Ethernet platform. During this time, cabling standards and Ethernet speeds largely progressed in sync. However, recent developments in standards are moving from a 'one solution does all' approach to Ethernet infrastructure that can handle a variety of situations using different cables and connectors. This requires making the best choices for each situation.

COMMON GROUND

Let's take a closer look at developments to date. Some 30 years ago we saw the first effort to arrive at a standardised structured cabling approach. A common network topology based on twisted pair cabling was created, with the intention of enabling buildings to be pre-cabled in a way that would support any type of ICT system. At that time, data network transmission speeds of 10Mb/s or 16Mb/s could be supported with Category 3 or Category 4 cabling. Soon, however, network data rate requirements grew and Ethernet speeds progressed from 10Mb/s to 100Mb/s and 1000Mb/s. To keep up with transmission performance requirements Category 5e and Category 6

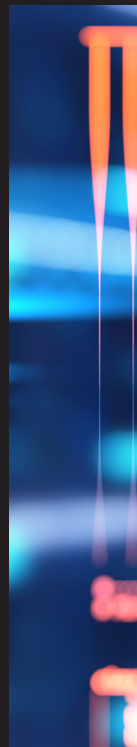
cabling standards were introduced.

During this same period, ISO/IEC decided to get ahead of networking technology standards with Category 7, anticipating what would be needed to support the next Ethernet speed. With this in mind, Category 7 was ratified by ISO/IEC in 2002 with the intention of supporting transmission speeds up to 10Gb/s, just as the Category 6 standard was finalised in both ISO and TIA. When work began in 2004 on the new cabling standard required to support IEEE 802.3an, or 10GBASE-T, the target transmission performance parameters were less stringent than what was provided by Category 7. This, coupled with the Telecommunication Industry Association's (TIA) desire to accommodate an unshielded channel, led to the development of the Category 6A standard.

NUMBER CRUNCHING

Introduction of Category 7A and Category 8 continued the trend of cabling standards bodies trying to stay ahead of networking standards by predicting the next generation of Ethernet. At this point it was already clear that the historical 10x step increment was no longer valid – so where would copper go from here?

In 2010, ISO/IEC introduced Category 7A cabling, with the intention of supporting 25 or 40 Gigabit Ethernet. However, it became apparent that the





1000MHz bandwidth in the Category 7A standard was not sufficient to support 40GBASE-T over the 100m distances used to date. Realising that the primary anticipated use case for these new high bandwidth Ethernet applications was the data centre, the first major shift away from the ‘one size fits all’ approach occurred, with the recognition that a reduced reach was acceptable for data centre applications. So when the IEEE standard for 25GBASE-T and 40GBASE-T appeared, a 30m reach was specified. Category 8 (TIA) and Category 8.1/8.2 (ISO/IEC), with a 2000MHz bandwidth to support 40Gb/s, were developed in 2017.

THE CURRENT SITUATION

As more IP devices appear and convergence and ‘Ethernet everywhere’ become a reality, standards bodies are focusing less on pushing for higher

and higher speeds. Instead, they are increasingly looking at requirements for specific applications and environments.

• Wireless access points (WAPs)

Some years ago, the IEEE started a technology initiative aimed at enabling 2.5Gb/s and 5Gb/s transmission over Category 6 – and possibly 2.5Gb/s over Category 5e – to support WAPs. But with commonly used cable densities, the amount of alien crosstalk when running 2.5Gb/s and 5Gb/s over Category 5e would slow down or even shut down some WAPs. Category 6A, with its improved alien crosstalk performance, put an end to the idea of running these new speeds over Category 5e.

• Data centres

CENELEC’s international EN 50600 series of standards covers all aspects of

design, construction and operation of data centre facilities and infrastructures. EN 50600-2-4, which covers the telecommunications infrastructure, allows for the use of structured cabling as well as application specific point to point cabling, listing recommended cabling types. The acceptance of point to point cabling was a departure from the original structured cabling standards methodology and represents the beginning of a new trend in cabling standards development.

- **Safety and fire performance**

Large volumes of cable have an impact on fire load and recent disasters have resulted in increased focus on the impact of building materials. Different spaces, from hospitals to data centres, have different evacuation and safety needs resulting in different cable fire rating standards. Each country and region tackles fire safety in different ways. The US approach is geared towards controlling smoke release and flame spread – cables should be self-extinguishing and shouldn't propagate fire. Article 800 of the National Electrical Code prescribes fire rated cables for riser, plenum and general purpose spaces. In Europe, however, the focus is on controlling smoke density and toxicity. Since 2017, the Construction Products Regulation (CPR) has offered harmonised rules for certification and labelling of

‘Standards bodies are focusing less on pushing for higher and higher speeds. Instead, they are increasingly looking at requirements for specific applications and environments.’

reaction to fire based on the EN 50575 standard.

- **Power over Ethernet (PoE)**

Power delivered through new generations of PoE is more than six times the level of the initial PoE standard. If not handled efficiently with the right cable design, this may significantly increase heat build-up inside cable bundles. In addition, arc-flash needs to be avoided so connectivity should comply with IEC 60512-99-02. With a clear trend toward powering devices requiring more than 25W, it is more important than ever to choose cabling specifically designed to support this new generation of PoE.

- **Smart buildings**

The ANSI/BICSI 007 standard provides requirements and recommendations for design and

implementation of structured cabling systems in intelligent buildings. This includes recommendations for building automation; heating, ventilation and air conditioning (HVAC); low voltage lighting; data/power transmission and other systems. BICSI 007 leverages requirements from other industry standards such as ANSI/TIA-862-B and ISO/IEC 11801-6, which were developed specifically to address



intelligent building cabling design best practices. These documents all include recommendations for the provision of cabling to new areas of a building that were not previously pre-cabled as data outlets. They are now considered equipment outlets or service outlets, to be connected to support a building's operational technology.

• Single Pair Ethernet (SPE)

New Ethernet standards operating over a single pair have recently been developed for industrial and automotive applications. The most recent is IEEE 802.3cg – 10Mb/s SPE – which supports point to point links up to 1000m and multidrop links for up to eight nodes over 25m. ISO/IEC and TIA have identified the great potential of this technology for use in building automation networks. To this end, new SPE cable and connector standards are in development to support this new technology. Completion of these standards is expected by the end of 2020. Deployment of SPE cabling is widely viewed as an overlay network that will likely support many different intelligent building systems with new SPE devices.

THE BEST OPTIONS

The way in which a building is used is likely to change over time. Automated monitoring, control, asset management and high bandwidth reserves and redundancy are essential. It's also vital to focus on optimising total cost of ownership and balancing growth with energy consumption. As a consequence,

new standards now take account of these different requirements and cover not only the speed of the application but also building use, environmental and climatic requirements, fire safety and security, distance expectations and the power requirements of connected devices. All these need to be considered when considering the optimum solution. ■



TODD HARPEL

Todd Harpel has extensive experience in communications infrastructure design and specification, and has worked with a variety of clients. During his career he has managed marketing, product management, technical support and training departments for several structured cabling industry manufacturers. Harpel is the current chairman for the CCCA Communications Committee and is the standardisation director for Nexans Tek-Center.



Nexans

Nexans has released a Category 6A field installable plug as part of its LANmark-6A offer. This is designed to build modular plug terminated links (MPTL), which are an increasingly popular method to directly



connect patch panels with network devices such as wireless access points and IP cameras. These devices are usually located near the ceiling, where there is often no possibility to

install an outlet or other connection box.

MPTLs are built with infrastructure cable terminated with an RJ-45 jack on one end and an RJ-45 plug on the other. They are now standardised in TIA 568-2.D and specified in the draft version of ISO/IEC TR 11801-9910 ED1.

The LANmark-6A Field Terminable Plug will support all Class EA applications, including 10GBASE-T and power over Ethernet up to 100W. It is fully shielded, accepts cable of 6.0-8.5mm diameter with AWG24 to AWG23 solid wires and is easy to install.

[CLICK HERE](#) to discover Nexans' Field Terminable Plug.

www.nexans.co.uk/LANsystems

HellermannTyton

HellermannTyton manufactures full end-to-end copper network infrastructure systems in Category 6A, Category 6 and Category 5e formats. From patch panels to patch leads and cable through to data outlets, HellermannTyton has an extensive product range that gives installers and end users a number of options when it comes to choosing the best solution for a project.

The HellermannTyton range of Zone Cabling solutions allows installers to work on existing network infrastructure with a range of products designed to make moves, adds and changes easier and quicker. HellermannTyton also offers the

RapidNet solution – a pre-terminated, pre-tested modular cabling system that eliminates the need for on-site terminations and significantly reduces installation times by up to 85 per cent.



HellermannTyton manufactures all of its products in the UK and has over 30 years of knowledge and industry experience. With a reputation for high quality and performance, HellermannTyton has a solution for any project of any size.

[CLICK HERE](#) to find out more, call 01604 707420 or to send an email [CLICK HERE](#).

www.htdata.co.uk

Siemon

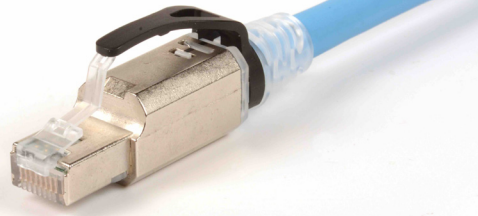
To protect against the impact of delivering higher levels of remote power over a cabling infrastructure to wireless access points, LED lights, video displays, digital signage and more, Siemon has equipped its copper cables, outlets, plugs and patch cords with innovative PowerGUARD technology. PowerGUARD includes patented crowned contacts on the company's Z-MAX, MAX and TERA outlets to ensure the integrity and reliability of contact seating surfaces when plugs and jacks are mated and unmated under load.

Incorporated into Siemon's Category 6A and 7A cables, PowerGUARD technology also combats the effects of heat build-up inside cable bundles, which degrades performance and causes premature ageing of jacketing materials. These cables are qualified for mechanical reliability in high temperature environments up to 75°C and

ensure superior heat dissipation and extremely stable transmission performance.

For connecting IP-based end devices directly to the network, Siemon's Z-PLUG Category 6A field terminated plugs with PowerGUARD technology feature a fully shielded 360° enclosure and 75°C operating temperature, providing superior heat dissipation in conjunction with Siemon PowerGUARD cables.

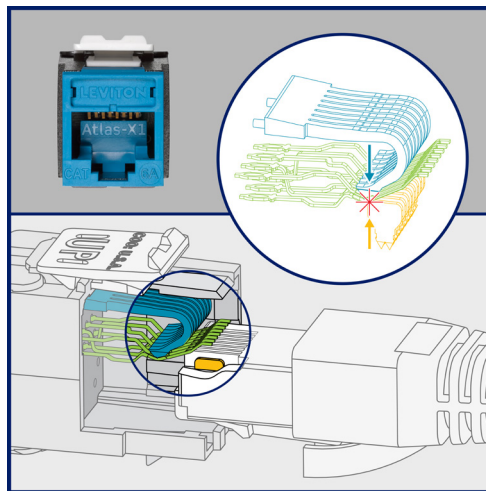
To find out more [CLICK HERE](#).
www.siemon.com



Leviton

Leviton's patented Retention Force Technology (RFT) is a unique polymer spring that supports connector tines and increases their resistance to strain and damage. This extends the life of connectors, saves on costly repairs and increases overall system longevity.

Following the insertion of a 4-pin or 6-pin plug or other foreign object, RFT helps connector tines return to their pre-stress position and protects against long-term damage.



For power over Ethernet (PoE) applications, RFT maintains contact force between the plug and connector, preventing electrical arcing from intermittent disconnects caused by vibration or operational movement.

RFT is available with Atlas-X1 and eXtreme connectors, and

select Leviton patch panels.

[CLICK HERE](#) to learn more.
www.leviton.com

R&M

R&M's new series of blogs covers a wide range of trends, technologies and cabling related topics. With so many different factors and options to consider, the blogs explain how to make smart, safe decisions without overspecifying or overspending, as well as offering guidance on selecting the right solution for an application.

Parties which are largely new to the cable industry are in need of advice but more experienced companies are also facing new challenges, as a consequence of network convergence and new technologies and applications. R&M



offers a great deal of expertise based on practical experience and its research and development capabilities, and can help clear up any confusion.

R&M is more than happy to share this know-how, as it benefits customers and prospects, as well as the networking and cabling industry as a whole. A comment function makes it possible for readers to add their own findings, ask questions

and engage in dialogue, and they are also invited to submit topics for future blogs.

To find out more and to read the blogs [CLICK HERE.](#)
rdm.com

iDAC Solutions (iDACS)

Smart building technologies utilise IP devices, sensors, controllers etc to monitor, manage and analyse facilities management (FM) systems and building usage. This gives owners and occupiers the ability to reduce energy consumption, improve efficiency and increase profitability.

With so much at stake, the cabling infrastructure these systems rely on is more critical than ever. The more provision for growth you build in today, the more you'll get out of it tomorrow – preventing a creaking, struggling cabling system with increased latency every time a new network or smart

device comes online.

iDACS supplies the best cabling

solutions available from industry leading cable manufacturers such as Swiss-based Datwyler (est. 1915), which are engineered to provide superior performance that is consistently higher than industry standards, as well as unrivalled reliability. Backed up by iDACS' free operations and

technical support, and Datwyler's 25-year system warranty, they provide achievable long-term support for your network.

To find out more [CLICK HERE.](#)
www.idacs.uk.com

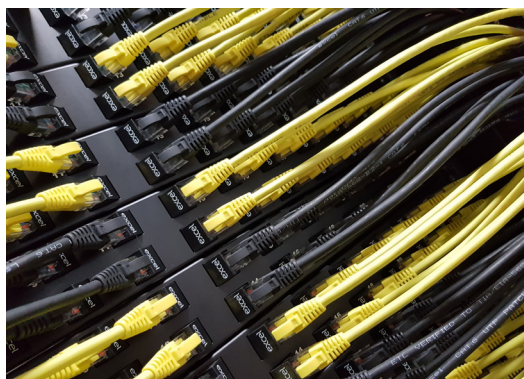


Excel Networking Solutions

Excel Networking Solutions offers one of the market's most comprehensive ranges of copper cabling solutions.

Inclusive of Category 5e, 6, 6A, 7A and 8 copper cable classes, Excel's structured cabling products constitute an end-to-end solution where performance and ease of installation

are prerequisites. Having evolved to face industry challenges, Excel offers high density designs as a space saving solution, such as the 0.5U patch panel and reduced diameter cabling.



When a system is installed by an Excel Cabling Partner, a **25 year warranty** can be awarded. This covers product

and applications assurance of compliance with industry performance standards appropriate to the class of copper cabling being installed. The full portfolio of Excel's copper cabling products is also

available in the **Copper Catalogue**.

CLICK HERE for more details about Excel Networking Solutions and its full range of products.

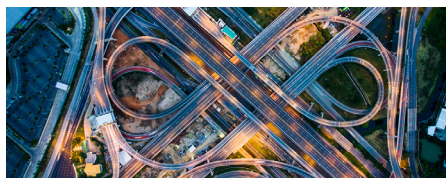
www.excel-networking.com

Draka/Prysmian

Draka, part of the Prysmian Group, has copper and optical fibre manufacturing facilities across the UK and Europe. The company uses its technical resources to reduce cable outside diameters, increase fibre counts within existing cable designs and provide infrastructure designers with more options for future expansion.

Within buildings we are seeing limited space as basket tray and risers become close to capacity. Draka is responding by:

- Developing hybrid designs that allow power, copper data and optical fibres to be incorporated into a single cable, saving



both space and cost.

- Fully integrating Prysmian's Sirocco blown fibre system into the Draka Universal Cabling warranty programme, offering increased design and expansion flexibility.
- Producing copper cables with reduced outside diameters. The Draka

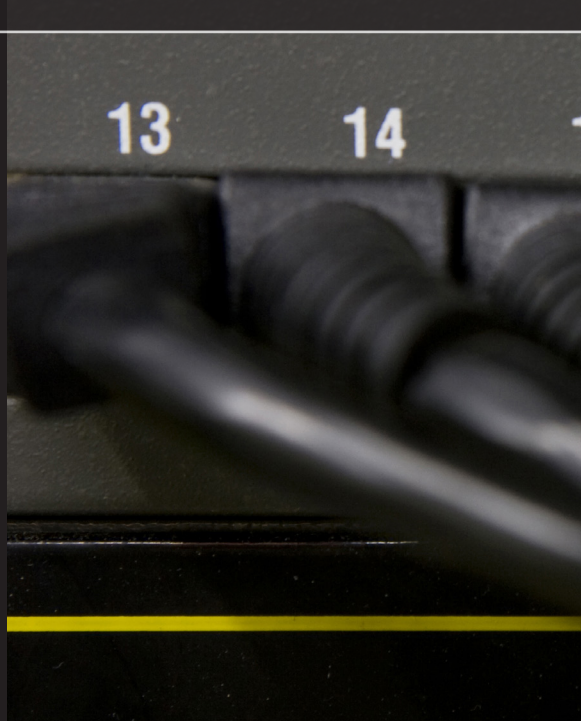
Category 6 U/UTP cable is a class leading solution with a 5.8mm outside diameter, while the Category 6A F/FTP is now 7.2mm and planned to be sub-7mm in the next round of design updates.

We can't predict the future, but Draka can be trusted to offer every possible option to future proof your network.

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

Rising high

Zoran Borcic of Draka/Prysmian examines the growing popularity of power over Ethernet (PoE) and how the latest standards in this area are helping to maximise its potential



40

▶ PoE continues to advance and, according to studies, the number of PoE-capable ports has tripled in the past five years. Network cables that can transmit more and more power are driving the trend.

MANY AND VARIED

Originally developed to power telephones, PoE is becoming increasingly important in other areas as well. These include the internet of things (IoT), smart office and residential cabling, as well as many other network compatible devices in commercial and industrial environments.

PoE transmits power and data over a single cable, saving the cost of purchase and operation of additional cabling. PoE injectors or switches/hubs serve as the power source and this technology can be used to supply remote devices such as webcams, surveillance cameras or wireless LAN access points that are often installed in inaccessible places. Another advantage

of PoE is the increased reliability of connected devices using an uninterruptible power supply (UPS), making continuous operation possible in the event of a power failure.

A WORLD OF OPPORTUNITY

Two variants are available for the transmission of energy between power supply equipment (PSE) and a powered device (PD). The spare pair procedure uses only the free wire pairs 4/5 and 7/8 for the power supply between PSE and PD. With phantom power, the voltage is supplied via all wire pairs, which are also used for data transmission – this means that the current flow is over the data line.

IEEE 802.3bt specifies the maximum achievable power over 4-pair PoE at between 72W and 90W. Thanks to this higher performance, even larger end devices, for example IP TV devices



in full HD, can now be supplied with energy via a data cable. Cable manufacturers are continuously working to further develop the PoE performance of network data cables – recognising the limited power output that the PoE process entails is still the biggest shortcoming to the wider adoption of this technology.

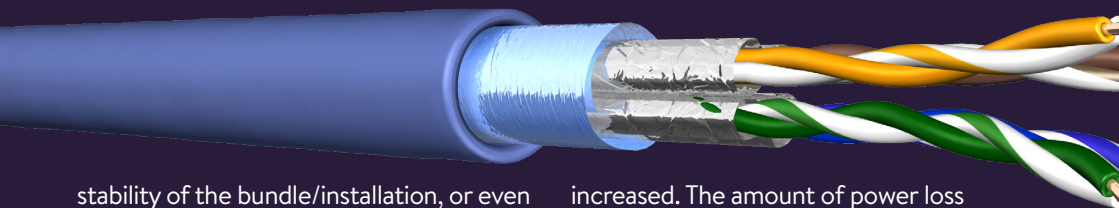
HEAT MANAGEMENT

The addition of electricity means an increased load for the cable/link/channel, which usually results in increasing cable bundle temperature. The more power a data cable delivers, the more heat is generated in the cable. It is a cable's ohmic resistance that generates heat – 25Ω/100m being the maximum channel. In addition, the bundle size and installation environment directly influence the cable's heat dissipation, leading to significant temperature increases.

Special care needs to be paid to patch cords. A channel which includes two/

three patch cords with smaller conductors (higher resistance) than the cable, could lead to the possibility of even higher temperatures being generated. The type of cable pathways used is a decisive consideration here. Grid cable pathway, perforated cable system or completely closed duct pathway made of plastic will have significantly different effects on temperature. Cable laid on open grille can keep cooler through airflow compared to closed duct. EN 50174-2 states under 4.5.4.2 that the degree of filling should not exceed 40 per cent. Correct planning, maintaining and execution of the installation will therefore have a direct influence on a cable's PoE performance.

When planning for PoE applications, heat management of the cable channel must be a top consideration, as continual heating and cooling over time will change a cable's performance. Replacing a patch cord with a product that is smaller in copper size and/or longer in length could change the



stability of the bundle/installation, or even the whole system. Heat build-up over a PoE channel can also negatively impact connectivity components. There is a real risk that if disconnected under load a spark can be generated, which could destroy contacts.

INCREASING EFFICIENCY

The maximum operating temperature for 4-pair cables is 60°C. If the temperature exceeds this limit, transmission properties decrease, along with softening of the insulation material and associated permanent structural symmetry loss. Optimising the efficiency of a PoE channel requires consideration of the maximum operating ambient temperatures of both the cable (60°C) and the components (50°C).

Other factors that need to be considered are power loss and heat dissipation. This leads to the calculation:

50°C maximum ambient temperature + power loss – heat dissipation = <60°C maximum heat limit

To achieve this optimum performance, the total heating effect from power loss versus heat dissipation must not, when combined, exceed 10°C. To maintain this operating limit of 10°C, the power loss must be reduced or the heat dissipation

increased. The amount of power loss depends on the current, resistance and the PoE pairs used. Other factors which influence the heat dissipation include bundle size, patch cords, shielding and airflow.

OUT ON THE RANGE

The key consideration here is DC loop resistance – the higher the loop resistance the less flexibility is available to the designer. A cable with a 24AWG conductor,

typically Category 5e, will have a DC-LR of 173.86Ω/km. A cable with a 22AWG conductor, or 0.645mm, typically Category 7A, will have a DC-LR of 108.70Ω/km. This gives an operating range that is 60 per cent higher than 24AWG. Put simply, larger conductor diameters improve the PoE range twofold.

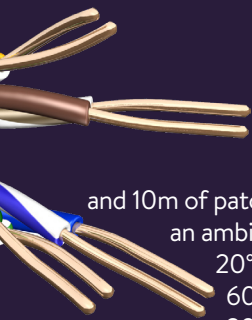
In addition to a larger conductor diameter, shielded cables also have a positive effect on heat dissipation, as the metal of the shield helps to dissipate the heat

generated inside. Smaller bundles and greater flowing air currents also promote heat dissipation and shielded cables allow greater flexibility in heat management at the design stage.

‘When planning for PoE applications, heat management of the cable channel must be a top consideration, as continual heating and cooling over time will change a cable’s performance.’

PLANNING GUIDELINES

EN 50174-2 illustrates how temperature increases the effect of the transmission path. To achieve the same transmission



performance as a cable channel consisting of a 90m permanent link and 10m of patch cords operating at an ambient temperature of 20°C, the same channel at 60°C would need to be 20 per cent shorter. This very clearly illustrates the importance of heat management at the planning stage. As previously stated, poor planning or changing patch cords with smaller conductors will further impact this effect. Patch cords with a conductor of less than 26AWG should always be avoided.

To further illustrate the importance of the cable's conductor size to the impact of heat management, ISO/IEC TR 29125 conducted additional testing of cable bundles at 1000mA per pair. It was found that in the case of 24AWG (Category 5e) conductor size, the maximum bundle size at the 10°C limit was 37. Within the same testing scenario, cables with 22AWG (Category 7A) conductors could be placed into a bundle of 64 cables before reaching the critical value of 10°C.

FLEXIBLE APPROACH

All cable categories support the PoE standard IEEE 802.3af, at and bt. However, when the critical impact of heat generation and, consequently, the need for heat management are taken into consideration, there are significant differences between the maximum bundle sizes that can be used and the maximum drive distances that can be achieved. It is clearly the case that the larger the conductor size and the shielding of the cable, the more flexibility is available at the planning stage, and this should affect the choice of patch cables both at planning stage and for ongoing maintenance. ■



ZORAN BORCIC

Zoran Borcic is Draka's global product manager datacom. He has been responsible for the worldwide product management of copper data cables and the implementation of Draka's brand strategy since 2005. He plans and manages the Draka data products portfolio, as well as coordinating EMEA marketing. His telecommunication and IT career started at Krone as product manager EMEA for main and digital signal distribution solutions, where he also worked in marketing.

Schneider Electric and Aveva extend partnership to deliver innovative solutions for the data centre market

As hyperscale providers build data centres with an expanding fleet to meet worldwide demand, the complexities in operating and maintaining these facilities are creating an unprecedented set of challenges. Operating at this scale requires a different approach for mission critical facilities powering the globe's digital infrastructure.

Aveva and Schneider Electric have announced their expanded partnership to deliver innovative solutions for the data centre market. Their monitoring capabilities will enable both deep and expansive visibility of day-to-day operations.



Pankaj
Sharma

Hyperscale data centre providers will benefit from this partnership by connecting platforms and data sets that previously existed in disparate systems. Data centre staff will be empowered to make faster, more informed decisions and optimise asset and operational efficiency throughout the data centre lifecycle.

'At a time when the world's digital infrastructure is being pushed to its limits, we are delivering a comprehensive solution for hyperscale data centres to operate and maintain their critical environments,' said Pankaj Sharma, executive vice president of the Secure Power Division at Schneider Electric.

Mayflex installs thermal cameras at its head office

Mayflex has installed thermal elevated temperature screening solutions from Hikvision to improve the health and safety of its employees and visitors during the coronavirus pandemic.

The system works by automatically checking forehead skin temperature in real time as people pass by. If a person is over a normal temperature threshold, an audible and visual alarm is given and they will be asked to verify their body temperature using a medical thermometer. If in the future face

masks become mandatory, the system can also verify if a visitor or employee is wearing one.

James Vian, technical and training manager at Mayflex, said 'The temperature screening solution has been installed in our main reception as well as the entrances at both the head office and our Environ House



MAYFLEX
A Sonepar Company

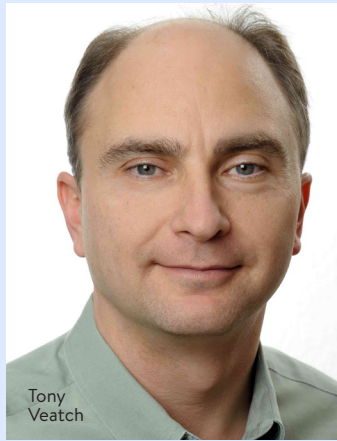
warehouse. The system includes the Hikvision Thermographic Bullet and Turret Cameras, with the addition of the Hikvision Blackbody Calibrator that increases the accuracy of the readings from $\pm 0.5^{\circ}\text{C}$ to $\pm 0.3^{\circ}\text{C}$.

Siemon joins HDBaseT Alliance to promote the benefits of standards based structured cabling

Siemon has joined the HDBaseT Alliance as an Adopter Member. The HDBaseT Alliance is a cross-industry group tasked with promoting and advancing the HDBaseT audiovisual (AV) application.

HDBaseT is a reliable, proven application for the transmission of ultra-high definition 4K video and audio along with 100Mb/s Ethernet, USB 2.0, bidirectional control signals and 100W of power over balanced twisted pair cable and RJ-45 network connectivity. The HDBaseT Alliance is active in educating the market on the benefits of the technology through dedicated content, webinars, participation in conferences and tradeshows, and more.

‘Over the past decade, we’ve seen balanced twisted-pair copper cabling



Tony Veatch

become a clear choice for connecting AV equipment and end devices,’ said Tony Veatch, global director of product management at Siemon ‘As a leading manufacturer of these cabling systems, we understand that high-performance cables and connectors play an important role in ensuring HDBaseT signal quality, remote powering capability

and the bandwidth to handle ultra-high definition video. We are therefore pleased to join the HDBaseT Alliance, as we see significant opportunities to further educate integrators about standards-based structured cabling and best practices in the design, installation and testing of the infrastructure that enables HDBaseT transmission.’

CHANNEL UPDATE IN BRIEF

Cato Networks has signed a distribution agreement with the Nuvias Group.

MAC Solutions has expanded its range of industrial data communication products by becoming a Cisco Select Partner. This partnership allows MAC Solutions’ customers to access the entire Cisco product range.

LogicMonitor has expanded its LogicMonitor Partner Network. New channel partners include Atos in the UK, Sirius in the US, Blue Turtle in South Africa, AIS in Mexico, and Aquion in Australia.

Gigamon has appointed Dave Woodcock as vice president EMEA to further accelerate market growth and support the region’s heightened demand for digital transformation, 5G and cloud initiatives.

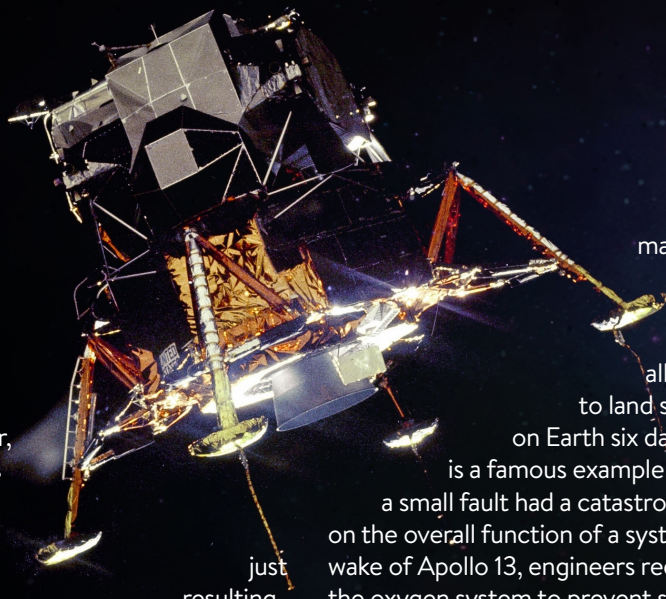
Exertis Hammer and A10 have extended their distribution agreement to service resellers in the Nordics.

Failure is not an option

When it comes to uninterruptible power supplies (UPS), Mike Elms of Centiel UK explains why achieving 100 per cent uptime must be the primary goal

▶ Apollo 13 was due to be the third crewed mission to land on the moon. However, the mission was aborted when an oxygen tank ruptured three days in, in a loss of oxygen supply capacity that put the lives of the crew in jeopardy. Complete disaster was avoided by the crew devising a workaround using

just resulting materials onboard the ship, which allowed them to land safely back on Earth six days later. This is a famous example of where a small fault had a catastrophic effect on the overall function of a system. In the wake of Apollo 13, engineers redesigned the oxygen system to prevent similar accidents, with a third oxygen tank added as a back-up. Eight more Apollo spacecraft flew and none of them experienced the same trouble again.



VALUE ADD

When it comes to UPS systems, as indeed spacecraft, if you value your critical load then ensuring the highest availability is paramount. But there is always a trade-off. The highest levels of resilience can be achieved within any electrical system by removing as many single points of failure as possible, and by adding redundancy. However, the more redundancy that is introduced, naturally the more it costs. But if the critical load really is that critical, compromising on correct configuration and quality to reduce costs is a false economy.

UPS technology has seen huge developments over the years. Systems have technically advanced, become more efficient and take up significantly less space than they previously did. The good news is that they cost less to purchase and run too.

Efficiency-wise, the most modern UPS have become about as close to perfect as possible, keeping in mind there will always

be some losses due to the very nature of electrical switching.

TRUTH WILL OUT

The latest true modular UPS systems are designed so each module contains all the power elements of a UPS including rectifier, inverter, static switch, display and, importantly, all control and monitoring circuitry. This configuration places it above other designs that can have a separate, single static switch assembly and the technology behind the intelligence modules means there is no single point of failure. Repair is easy, as whole modules can be hot swapped, giving a mean time to repair (MTTR) of less than three minutes.

However, installing a truly modular UPS, which ensures maximum resilience and availability, is only helpful if the cables connecting all the components themselves do not create a single point of failure. The simplest communications bus is a single cable – if this breaks, or becomes disconnected, the entire system could be compromised. For this reason, the ring circuit has been introduced within the majority of modern UPS systems. If



‘UPS technology has seen huge developments over the years. Systems have technically advanced, become more efficient and take up significantly less space than previously. The good news is that they cost less to purchase and run too.’

the circuit breaks the signals can simply communicate the other way around the fault. However, the introduction of the triple mode communications bus is the safest option of all.

THREE CHEERS

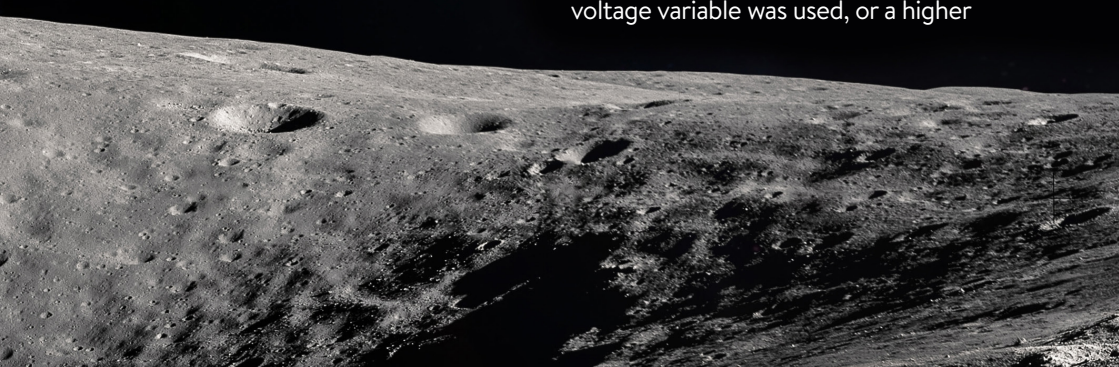
As its name suggests, the triple mode communication bus has three paths of communication between UPS modules and parallel frames made up of three separate ring circuits. Three brains communicate with three other brains in each module – it’s the belt, braces and buttons approach.

We can liken triple mode to the comparison between a tightrope walker and someone walking across a bridge. If a tightrope breaks, the consequences will be dramatic and far reaching. In the same way, a single communications bus is far more precarious than a triple mode ring connection, which is more like a bridge with multiple supports. Here the single points of failure are completely removed. Even if one or several bridge struts fail, the others will support the load.

POWER RANGER

It’s a similar story with batteries. Modular systems can either have individual batteries associated with each module, or an option where a common battery string is used for all the modules. But what if the busbar connecting all the batteries in the common battery string fails? The whole UPS system becomes unavailable. Each time we remove a point of failure we increase the level of availability, but this also increases the cost. It is important customers are aware of this trade off from the outset and are comfortable with the level of availability their system provides.

There are other areas too which can introduce issues that reduce the availability of a UPS. I’ve talked about battery calculations in *Inside_Networks* before. If two manufactures quote for a similar system and one has a significantly cheaper battery calculation there will be a good reason for this when you look at the small print! It may be that the calculation was made for batteries operating at a higher temperature than normal, it may be because a low battery end of discharge voltage variable was used, or a higher



percentage efficiency improvement was estimated by negating the front end rectifier conversion. Always read the fine print.

CHECK MATE

Maintenance is another area of concern. The best, most available UPS configuration will only continue to do its job if it is properly checked and maintained over time. There is sometimes a perception that a UPS is a bit like an item of mechanical plant, like a boiler or a pump, so there is a tendency to overlook its importance. But it's no good spending vast sums on new servers to sit in a rack if they're supported by an ageing UPS system that has been sat in a plantroom and not maintained for several years. For medical applications needing power for equipment to save lives, the UPS is even more important.

Therefore, deciding on the level of resilience requires an assessment of the value of the critical load. Any manufacturer can quote for a cheaper system, however, customers need to be aware that this will result in less resilient protection. It may be a cheaper part made of lower quality materials that is more likely to fail, or a lower battery calculation resulting

in a shorter runtime. Similarly, availability may be reduced by introducing the small risk of using a common battery string or purchasing a modular system without triple mode. However, if that critical load is worth protecting the increased availability is worth the price, so it's important for customers to be aware of the cost versus limitations of their UPS system.

SAFE SPACE

The crew of Apollo 13, and the team who worked so hard to get them home safely, would have preferred to know there were no elements of the space shuttle where maintenance was overlooked and which would have avoided the whole mission being compromised. So, when failure is not an option, the simple message is don't cut corners and don't compromise on availability. ■

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MIKE ELMS

Mike Elms has more than 25 years of experience in the UPS industry and joined Centiel in 2018. As managing director, he has overall responsibility for driving the UK business forwards as part of Centiel's global expansion plans.



Sunbird Software

Easily transform all the data being collected in your facility into actionable information with Sunbird's data centre infrastructure management (DCIM) software.

With the latest release of dcTrack 7.1, Sunbird now comes out of the box with over 100 zero configuration dashboard

widgets to deliver at a glance views of your most important data centre resource and capacity key performance indicators (KPIs).

The new Circuit Breaker Utilization widget allows greater insight into all the breakers in your power chain, providing you

with the ability to get the most out of your existing power resources, while avoiding potential costly downtime. And the new

Historical Item Counts widget gives you a simple view of your asset deployment trends.

Additional new features include full support for DC power,

configurable breaker ratings, 3D views of colour coded cabinets and equipment by customers, easier impact analysis and much more.

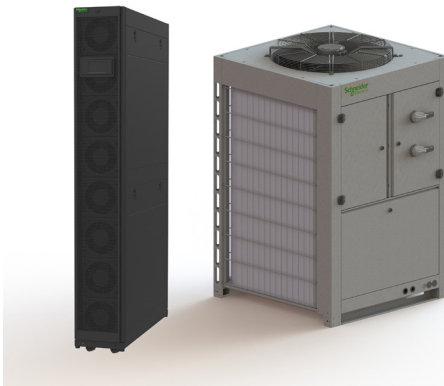
[CLICK HERE](#) to schedule a demo.
www.sunbirddcim.com



Schneider Electric

Schneider Electric's EcoStruxure Ready cooling portfolio with the 30kW InRow DX solution is available in a 300mm rack format and offers industry leading efficiency.

The trend towards the modernisation and consolidation of data centres is driving the need for a cooling solution that provides more capacity in a smaller footprint and can flexibly adapt to the actual data centre load. The 30kW InRow DX is ideal for data centres that are being modernised or retrofitted, or anywhere IT space is at a premium.



It uses energy efficient compressor and fans to reduce operational expenditure and make more power available for other IT equipment. Furthermore, due to its powerfully compact size and energy efficient design, the InRow DX is the most

versatile and predictable cooling system for next generation small and medium data centres, and an optimal choice for edge and enterprise environments.

To find out more [CLICK HERE](#).
www.schneider-electric.co.uk

EDP Europe

Energy management in data centres and enterprise IT environments is vital if they are to be cost and energy efficient. One of the areas where the biggest savings can be achieved is through effective airflow management and cooling optimisation. Energy management is often measured as Power Usage Effectiveness (PUE), with cooling representing 35 per cent of the total load and 73 per cent of the non-IT load.

EDP Europe, in association with Upsite Technologies, recently conducted two webinars on how following airflow management and cooling

optimisation best practices can achieve quick improvements to a data centre's efficiency that have a big impact on energy costs and performance.

The webinars were conducted by Lars Strong, a leading expert in data centre airflow management, and recorded. A link to request access to the recording can be found on EDP Europe's website.

[CLICK HERE](#) to find out more, call our sales team on 01376 501337 or [CLICK HERE](#) to send us an email.

www.edpeurope.com

The graphic features the EDP logo and website URL at the top. The main text reads 'Data centres don't stop. Neither does EDP Europe.' Below this, a red banner says 'COOLING OPTIMISATION' with a thermometer icon. The bottom section contains the text: 'How quick improvements to Airflow Management and following Cooling Optimisation best practices can have a BIG IMPACT'. To the right is a diagram of a data center room with labels for 'RACK', 'ROOM', and 'RAISED FLOOR', and an illustration of a person pointing at it.

Centiel

Centiel UK has been awarded ISO 14001:2015 Environmental Management System accreditation by the BSI, which it has added to its BSI accredited ISO 9001:2015 Quality Management System and its BSI accredited OHSAS 18001:2007 Occupational Health & Safety Management System certifications.

David Bond, chairman at Centiel UK, explained, 'We are now one of the very few companies in the UK's UPS industry to hold all three of these key BSI accreditations, enabling us to deliver more than regulatory compliance and the ability to meet supplier requirements. BSI has received official UK accreditation status from UKAS, which means it has been assessed against

internationally recognised standards.'

Karen Rough, service and compliance manager at Centiel UK, added, 'Our ISO 14001 certification required us to document multiple aspects of our business

in relation to the environment. This included recording processes about how we purchase, manage, store and dispose of certain products such as batteries, for example, and how we work to reduce our impact on the

environment. We needed to show working examples of our processes and records, and how all staff adhere to the management system we have in place.'

For further information [CLICK HERE](#). www.centiel.co.uk



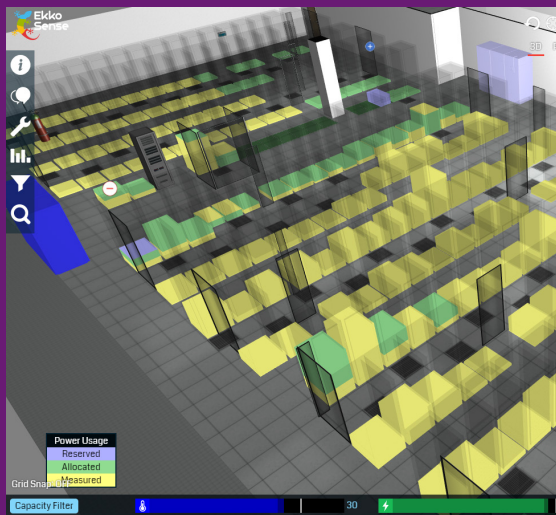
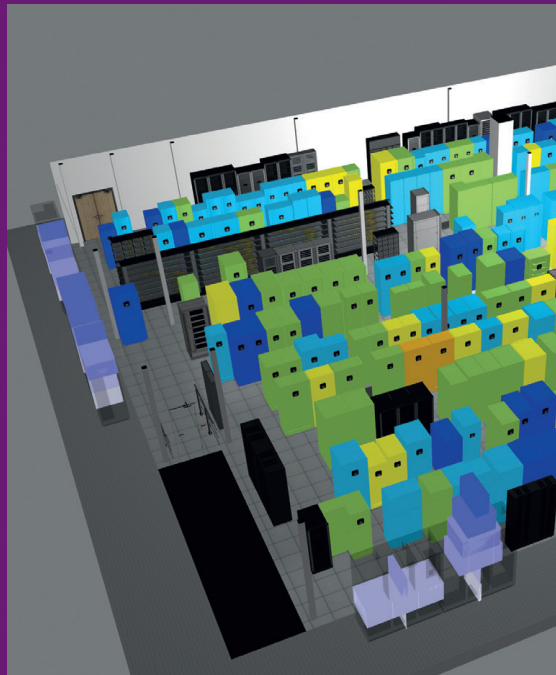
Winds of change

▶ A doctor was asked about how the coronavirus lockdown saw him transition from a world of 95 per cent face-to-face appointments to a diary that's now almost entirely full of online consultations. He said it was like undergoing 10 years of change in under a week. This is just one indicator of the multiple resets that were triggered across the world by the cumulative response of governments and organisations to the pandemic. It's also a reflection of just how quickly people and operating models can actually adapt when they are faced with a profound external change.

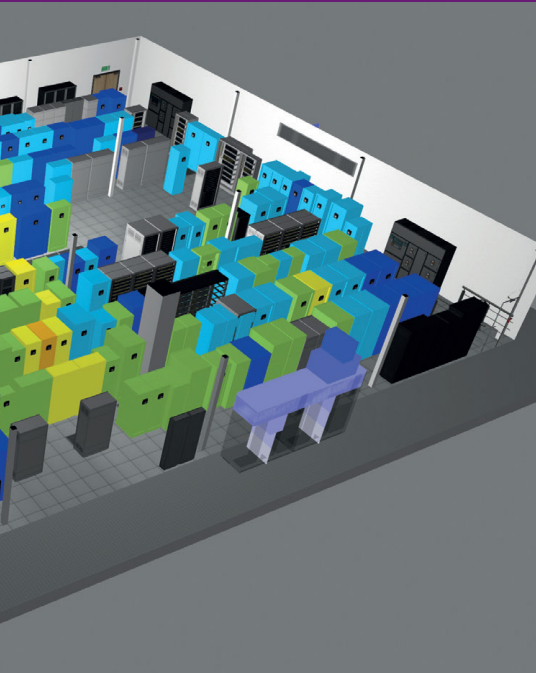
REMOTE CONTROL

Nowhere was this more apparent than in the rapid switch from accepted standard working patterns to widescale remote working. Google Mobility research for the UK, for example, showed that during the last two weeks of March, commuter activity at transport hubs was down 75 per cent, and 55 per cent down at places of work. That's a massive shift, and one echoed by Microsoft, which reported a 200 per cent increase in meetings on its Teams platform and a 10x increase in video call volumes over the same period.

With everyone apart from non-critical workers in lockdown – either working from home or furloughed – it was clear that new levels of demand were being placed on hosted service providers. Social media usage went up by 50 per cent, video streaming on Netflix and YouTube by 60 per cent – necessitating a reduction in streaming quality – while many enterprise



tu Redshaw of EkkoSense looks at how to manage data centre energy performance in these challenging times



cloud platform users experienced much slower service levels due to increased customer demands.

CLEAN AIR

The sheer scale and speed of this transition has led some commentators to wonder whether these resets are somehow providing us with an early insight into what a net zero world could look like. Certainly, with the early lockdown leading to dramatically less traffic on our roads and an almost complete lack of planes in the skies, the pandemic initially led to a noticeable improvement in air quality across many of the world's major cities.

However, these improvements were only ever likely to be short-term. Data from NASA showed that air pollution in China picked up quickly as soon as people started returning to work. It also perhaps illustrated that any longer-term transition towards a net zero future was never going to be simple, particularly as it appeared that during lockdown we simply traded physical congestion for heightened levels of digital consumption.

DEEP IMPACT

It's against this background that we need to consider the exceptional impact of the pandemic on data centres worldwide. Given that maximising data centre performance is difficult enough during normal conditions, it's hardly surprising that optimising while also trying to accommodate additional coronavirus related pressures only increased complexity levels for data centre operations teams.

What's clear is that data centre teams – facing unprecedented levels of demand for services – needed more help than ever before during the lockdown period, particularly as it made it difficult for

‘Remote monitoring capabilities provide an immersive 3D digital twin of a data centre – letting individuals monitor individual rack and cooling unit thermal performance in real time.’

anyone but essential staff to work on-site. Many operators restricted access, while others closed their facilities to customers, contractors and other external visitors.

This made it challenging for organisations to ensure business continuity, while at the same time dealing with the day-to-day reality of site lockdown such as having staff absent through self-isolation, ensuring social distancing within data centre rooms, as well as managing the resource implications of split rosters.

WALK THE WALK

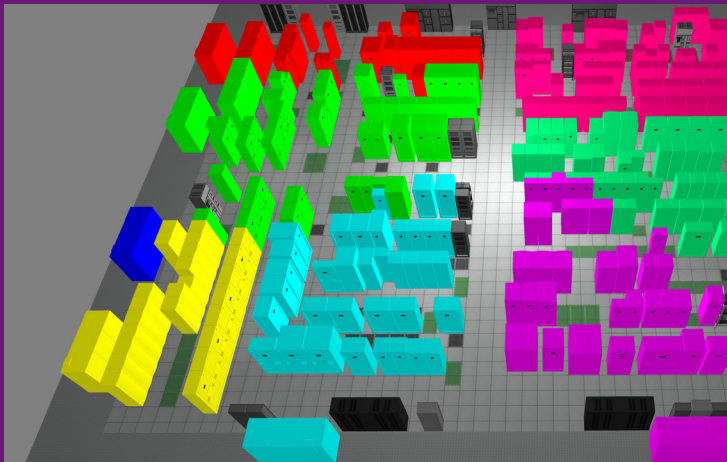
As operations need to do everything possible to reduce staff exposure to potential coronavirus infection, it makes facility walkthroughs difficult. And with heightened levels of customer demand leading to increased pressure on energy and thermal performance, new monitoring approaches are necessary.

Remote monitoring capabilities provide an immersive 3D digital twin of a data centre – letting individuals monitor individual rack and cooling unit thermal performance in real time. This kind of control is vital when data centre operations

teams have more limited resources, enabling them to ensure management to ASHRAE key performance indicators (KPIs) and gain early insight and alerts into any concerning thermal and cooling metrics. Additionally, being able to monitor remotely also could have proved essential during any potential site evacuation or deep clean.

ONGOING REQUIREMENT

While these challenges will ease in time, organisations still need to recognise that the requirement for remote thermal, energy and capacity management is



likely to remain a requirement for the foreseeable future. And while there’s acknowledgement that operations teams had to move quickly to balance increased data centre loads and business continuity during the immediate shift towards remote working, there’s now an understanding that accommodating this kind of change can’t come as a distraction to their long-term business and operational goals.

That’s particularly the case with carbon reduction commitments. Given the scale of the challenge, the data centre

sector – which already burns more carbon globally than the aviation industry – has a critical role to play in supporting progress towards net zero. Most data centres still aren't doing enough to optimise their energy performance. When faced with an external challenge – such as adapting to the increased thermal demands placed on facilities by a switch to homeworking – the default position for many operations teams quickly reverted to throwing more cooling at the problem.

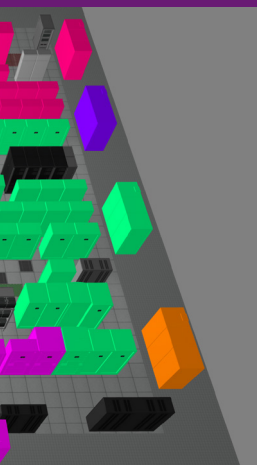
Before the coronavirus outbreak we knew that even today's best run data centres still have power and capacity challenges – and that cooling issues already accounted for almost a third of unplanned data centre outages. Despite these concerns, less than five per cent of data centre managers were actively gathering the data they needed to effectively manage their thermal performance. And, although it's understandable that data centre teams should prioritise risk avoidance

for their critical services, the standard practice of simply adding more and more expensive cooling hardware to handle escalating capacity demands is storing up a serious carbon issue for organisations trying to move to net zero.

NEXT STEPS

Some of the smarter data centre teams are already using the latest software driven thermal optimisation techniques to not only secure data centre energy savings but also successfully remove 100 per cent of

thermal risk from their facilities. Because of this, the best practice bar is shifting, with average cooling energy savings of 24 per cent helping data centre operations to address both their operational and environmental goals. ■



STU REDSHAW

Stu Redshaw is chief technology officer at EkkoSense. He holds a doctorate in heat transfer and thermodynamics from Nottingham University and specialises in revolutionary clean tech and energy efficient systems. In addressing today's data centre thermal challenges, his goal has always been to look at technical problems from first principles and challenge the status quo.

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

Where Next For Hyperscalers? is the question posed in a blog by **AFL Hyperscale**. **CLICK HERE** to read it.

OLTS & OTDR: A Complete Testing Strategy is a white paper from **Fluke Networks**. **CLICK HERE** to download a copy.

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Nexans is writing a series of papers
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technology. The first takes a closer
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possible configurations are.
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SEDC supports ABB's Smart Buildings factory

Developed by Rittal, Hewlett Packard Enterprises and ABB, the Secure Edge Data Centre (SEDC) supports all the critical systems of a full size data centre in a 19-inch server rack. An SEDC has recently been installed in the 40,000m² ABB Smart Buildings factory in Schaffhausen, Switzerland.

The factory upgraded its production and logistic systems to achieve a higher degree of automatisation, and this required appropriate IT infrastructure and systems to operate smoothly, as well as to store and back-up relevant data. However, the factory lacked any dedicated space on-site in which to host the IT equipment for the machines.



The decision was taken to install a SEDC to store the back-up IT systems. The SEDC is a secure enclosure, which has been designed and manufactured by Rittal to provide a safe environment for sensitive electronic or electrical equipment. A Rittal cooling system maintains optimal climate conditions inside the SEDC, while a Rittal monitoring system gives users remote access to climate conditions and provides data on the status of the systems within the enclosure.

EcoDataCenter to deploy chassis-level immersion liquid cooling solution

Iceotope, in conjunction with Schneider Electric and Avnet, is to deploy its chassis-level immersion liquid cooling technology at EcoDataCenter's new colocation facility in Falun, Sweden.

The Iceotope solution will enable 46kW per rack, with the core technology capable of scaling to power densities of 100kW plus.

Liquid cooling can improve chip and hard drive reliability by providing a lower stable operating temperature, as well as increasing the available white space by

eliminating the requirement for hot aisle/cold aisle layouts. Importantly, the cooling arrangement enables high-grade heat to be

captured for reuse in a local renewable energy scheme.

With an operating PUE of 1.03, analysis of chassis-level immersive cooling shows significant capital expenditure savings of 14 per cent and at least 10 per cent energy

savings, when compared with traditional air cooled approaches for a 2MW facility. Over a 20 year period, this provides a reduced total cost of ownership of 11 per cent.



Nexans delivers fibre optic infrastructure for the Société du Grand Paris

Nexans has successfully completed a fast-track project for the Société du Grand Paris (SGP), which comprised an optical fibre infrastructure for its new 30,000m², nine-floor, Ile-de-France headquarters.

The building has been equipped with Nexans' LANactive Fibre to the Office (FTTO) solution, which enables lower energy consumption, reduced air conditioning and simplified access controls, as well as optimisation of space usage for employees. This is an alternative



approach to traditional LAN that uses fibre cabling together with FTTO switches to deliver Ethernet services to equipment via standard RJ-45 copper technology.

The LANactive solution installed for the SGP

comprises 4.3km of fibre cable together with connectors and 530 FTTO switches. As well as installing the infrastructure, Nexans also supported SGP in the configuration of the FTTO switches, trained SGP teams on the use of the management and supervision software platform, and ensured the interoperability of services.

PROJECTS & CONTRACTS IN BRIEF

Equinix has expanded the Equinix Cloud Exchange Fabric in Barcelona, Brussels, Geneva, Istanbul, Lisbon and Sofia, and Hamburg in Q2 2020, to help global businesses simplify hybrid and multi-cloud infrastructures.

Deutsche Telekom Global Carrier recently implemented the first European 800Gb/s network connecting its data centres in Vienna. The technology, provided in cooperation with Ciena, will satisfy customers' demands for higher speeds and efficiency.

SSE Enterprise Telecoms has won a £10.5m contract from Aberdeenshire Council to supply full optical fibre to hospitals, schools and businesses.

UKCloud has announced further investment in its partnership with VMware through the achievement of VMware Cloud Verified status and the launch of various VMware based capabilities, which help public sector organisations accelerate their digital transformation.

Nextgenaccess has completed a new 67km high capacity carrier neutral fibre network connecting Bradley Stoke in Bristol to Next Generation Data's (NGD) data centre near Newport in South Wales.

Asperitas has announced a partnership with maincubes. The two companies will start offering immersion cooling solutions in dedicated immersion cooling colocation suites in the maincubes Amsterdam AMS01 data centre.

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The real deal

Niclas Sanfridsson of Colt Data Centre Services (DCS) examines why artificial intelligence (AI) is here to keep data centres innovative



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▶ There is no denying the importance of the role that data centres play in modern IT solutions. As an integral part of modern IT strategies in enterprises and organisations of all sizes, it is critical for data centre providers to ensure that their services are reliable and keep up with the demands of customers. Ensuring that issues are resolved proactively is the key to preventing damaging downtime.

SOUND OF SILENCE

With the uptake of demand created by the rapid adoption of data intensive technology such as AI, some providers are struggling in silence when it comes to providing and maintaining the required services. This is because many older data centres still contain infrastructure that was

designed for simpler and less data intensive age.

However, as we see time again with new technology, the challenge can also create the solution. In this instance, AI is increasingly being used by data centre operators to simplify and enhance their operations, allowing them to boost network efficiencies and improve the reliability of their services. This approach is mutually beneficial for providers and customers alike – data centre providers are better equipped to meet the most demanding of service requirements, whilst improving day to day management. On the flipside, customers can rest assured that their IT solutions are hosted in a stable and reliable environment with a minimised risk of disruption.

‘In an industry where downtime is money lost, AI is a vital tool for operators in identifying faults and preventing issues from compounding into service disruption.’

SMART ATTACK

Many data centres still retain dated practices that are from a bygone age. Traditionally, data centre operations teams are on perpetual high alert for faults in facility infrastructure. For example, an overheating server from a malfunctioning cooling unit can have very serious consequences for customers if the problem isn't immediately solved. Since no-one can tell precisely when a component will fail, this requires data centre engineers to be on constant standby, either in the data centre itself or on-call.

Compare this to far simpler machines such as automobiles or assembly lines, which often have thousands of sensors constantly monitoring every component involved in operation. To use an everyday example, sensors in your car provide real time insight into problems or failures. When an issue is detected by a sensor, the driver is alerted by a warning light and in modern connected cars, even local dealerships may be alerted when the car senses a part is exceeding tolerances.

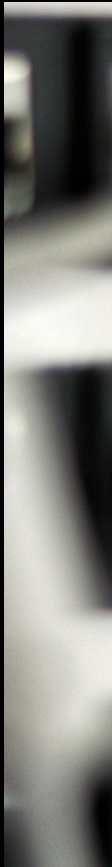
In order to ensure reliability, today's data centres must employ the same technology to monitor their vast and complex network infrastructures. With the increased visibility afforded by sensors, AI can monitor an entire data centre, including physical and virtual infrastructure, for anomalies 24/7. If a sensor detects that an area of infrastructure may be at risk of failure, an alert will be sent to the

operator. This affords valuable time for the engineers, who can then investigate the issue before any failure can occur. If there is an issue, it can therefore be solved proactively, minimising the potential for disruption or downtime.

ENERGY BOOST

Data centres are invisible to the average internet user, who has no idea of the huge amount of energy that they consume. In fact, it is estimated that data centres will account for a fifth of the world's electricity consumption by 2025. With the current climate in mind, data centre operators have an obligation to their customers – and, of course, the planet – to manage their energy usage efficiently. Operators must implement solutions that ensure reductions in running costs whilst meeting targets for reduced carbon footprint.

When it comes to energy efficiency, AI has a critical role to play. It can be implemented to continuously monitor and evaluate energy usage, ensuring that energy is being distributed and recycled in the most efficient manner possible. Take heat recycling – temperature control is one of the most energy intensive elements of day to day data centre operations and even the smallest of efficiencies in cooling systems can have a considerable impact on overall energy consumption.



INTELLIGENT SECURITY

Data centres are some of the most secure places on the planet, but they are not invincible. In both physical and virtual spaces, AI is an invaluable weapon in protecting an organisations data. For example, intelligent CCTV can be implemented to track every person on

spot anomalies that could be missed by security teams.

On the virtual side, AI and machine learning are crucial for identifying and neutralising new types of malware. The modern threat landscape is highly complex and teeming with threats that are constantly evolving to evade traditional



the data centre premises, automatically detecting suspicious behaviour and alerting security if required. This improves physical security around the perimeter as well as within the data centre itself and can help

signature recognition based cybersecurity systems. Further, AI can not only identify suspicious data traffic but it can also suggest solutions that prevent malicious activities from occurring in the future,



activities from occurring in the future, allowing cybersecurity teams to anticipate threats before they can occur.

IN FULL EFFECT

AI's potential in the data centre is nearly limitless, and we've only been able to focus on a few of the areas where it will bring transformational benefits. AI and machine learning have a massive role to play in bringing down the time taken to identify and resolve infrastructure issues. In an industry where downtime is money lost, AI is a vital tool for operators in identifying faults and preventing issues from compounding into service disruption. For these reasons and many more, AI will be increasingly utilised in data centre operations for the foreseeable future, so watch this space. ■

NICLAS SANFRIDSSON

Niclas Sanfridsson is the CEO of Colt DCS. In his current position he is responsible for the strategic growth of the entire data centre business, and the aggressive growth and expansion plans for its hyperscale portfolio across Europe and Asia. His previous positions include CEO of Pulsant and managing director of Equinix in the Nordic region.

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