

# Inside Networks



## If you stand the

MINIMISING TEMPERATURE  
INSTALLATION

## To the next

DEVELOPMENT  
COPPER CABLE  
STANDARD  
APPLICATION

THE NETWORK INFRASTRUCTURE

JUL  
18

A yellow triangular warning sign with a black border and a black flame icon, indicating a fire hazard.

# can't the heat

ATURE RISE IN POE  
ITIONS

## he t level

MENTS IN  
ABLING  
DS AND  
ONS

## Time to think

WHAT SHOULD BE A PRIORITY  
WHEN UPGRADING AN  
AGEING DATA CENTRE?



# Shed light on your network

## Siemon's new lighter-coloured cabinet solutions

---

Siemon's VersaPOD®, V800™, V600™, Wall-mounted cabinets and accessories are now available in white and grey, to help improve the look and working conditions of your data centre.

- **Improved Visibility** – Reflects up to 75% more light, making it easy to see connections and equipment in dim lighting conditions.
- **Better Aesthetics** – Lighter-coloured cabinets have a sleek modern look, blend better into the surrounding décor and are less prone to visible scratches.
- **Potential Cost Savings** – Because lighter cabinets improve visibility, lighting energy may potentially be reduced for operational cost savings.

## 6 ROB'S BLOG

Think big

## 9 NEWS

All that's happening in the world of enterprise and data centre network infrastructures



## 14 MAILBOX

The pick of the recent emails to Inside\_Networks

## 19 QUESTION TIME

Industry experts examine what challenges data centre owners and managers face in terms of keeping their facilities up-to-date



## 33 CHANNEL UPDATE

Moves, adds and changes in the channel

## COPPER CABLING STANDARDS

James Withey, liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3, explains the recent developments in copper cabling standards and applications

## 36



## COPPER CABLING PRODUCTS AND SYSTEMS

A selection of the very best copper cabling products and systems available today

## 40

FOR A FREE  
SUBSCRIPTION  
TO

**Inside\_Networks**

[CLICK HERE](#)



46

**QUICK CLICKS**

Your one click guide to the very best industry blogs, white papers, apps, podcasts, webinars and videos



48

**ENERGY MANAGEMENT**

Mo Sheikh of Geist, a division of Vertiv, explains how to cut costs and improve data centre efficiency by using switchable power distribution units (PDUs)



52

**ENERGY MANAGEMENT SOLUTIONS**

State-of-the-art energy management solutions profiled



56

**ENERGY MANAGEMENT**

Peter Thickett of Siemon looks at current data centre energy usage trends and why using the right power distribution devices can help lower Power Usage Effectiveness (PUE)



60

**PROJECTS AND CONTRACTS**

Case studies and contract wins from around the globe

63

**FINAL WORD**

Jonathan Dunbar of Leviton explains how to minimise temperature rise in power over Ethernet (PoE) installations



# Introducing the



## Certified Network Infrastructure Design Professional

Certify your knowledge and gain:

The highest levels of knowledge, skills and confidence to deliver complex infrastructure design projects

BTEC Level 5  
Professional Award

Official  
CNIDP® Certification

Use of CNIDP post  
nominal title

Use of the  
CNIDP® Logo

## 8 DAY PROGRAM

Learn how to complete a detailed network infrastructure design project and deliver this to the market via an effective tender response.

The **Certified Network Infrastructure Design Professional (CNIDP®)** program equips network infrastructure professionals with the knowledge, skills and confidence to deliver complex infrastructure design projects from inception through to customer hand-over.

- ▶ Make effective design decisions
- ▶ Deliver detailed drawings
- ▶ Create effective project plans
- ▶ Generate bill of materials and other documentation
- ▶ Understand tendering processes

*“Since I completed the CNIDP® program I have won two tender bids. I am very impressed with the program and will be recommending it to my colleagues.”*

[Download full program details here](#)



Customer Focused ▶▶  
Quality Driven ▶▶▶▶



Certified Network  
Infrastructure  
Design Professional

BTEC Level 5  
Professional Award

=

PROFESSIONAL UNIT  
3 DAYS

+



CORE UNIT  
5 DAYS

Certified Network  
Infrastructure Design

[info@cnet-training.com](mailto:info@cnet-training.com)  
**+44 (0)1284 767100**  
[www.cnet-training.com](http://www.cnet-training.com)

# Acting your age

## EDITOR

Rob Shepherd  
07708 972170



## SUB-EDITOR

Chris Marsland

## ADVERTISING MANAGER

Kate Paxton  
01603 610265



## CREATIVE DIRECTOR

Vishnu Joory

## TECHNOLOGY CONSULTANT

James Abrahams

## CIRCULATION MANAGER

Debbie King

## ACCOUNTS

Billy Gallop



All rights reserved.

No part of this publication may be used, transmitted or produced in any form without the written permission of the copyright owner. Applications for written permission should be addressed to

[info@chalkhillmedia.com](mailto:info@chalkhillmedia.com)

The views and comments expressed by contributors to this publication are not necessarily shared by the publisher. Every effort is made to ensure the accuracy of published information.

© 2018 Chalk Hill Media

The data centre sector is usually considered to be a new kid on the block and relatively speaking it is. However, time moves quickly and many of the facilities that were built early on are now over 15 years old. Therefore, even with regular servicing, many owners and managers of these facilities will be considering upgrading their technology in order to ensure maximum operational uptime.

Any upgrades will, however, need to be carried out on an incremental basis and live refurbishment of a data centre technology offers many challenges. To look at this issue in more depth and assess what should take priority, we've asked a panel of experts to offer their opinions and you can read this month's Question Time by [CLICKING HERE](#).

After we ran our 'exit interview' with Alan Flatman last month, following his decision to retire, tributes poured in and it's clear that Alan made a significant impact upon the industry. After dedicating so much of his career to standards, he'll be pleased to know that developments in this area continue apace and in this issue James Withey, the new liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3, explains the recent developments in copper cabling standards and applications. [CLICK HERE](#) to read his article.

At Inside\_Networks we've always endeavoured to promote environmentally friendly practices and highlight what's being done to improve energy management. We've got two excellent articles on this subject and, in the first, Mo Sheikh of Geist explains how to cut costs and improve data centre efficiency by using switchable power distribution units (PDUs). Secondly, Peter Thickett of Siemon looks at current data centre energy usage trends and why using the right power distribution devices can help lower Power Usage Effectiveness (PUE) within the data centre. [CLICK HERE](#) to read Mo's article and [CLICK HERE](#) to read Peter's.

Last but certainly not least, I'd like to say a massive thank you to all those who participated, sponsored and provided raffle prizes for the Inside\_Networks 2018 Charity Golf Day. The amazing sum of over £10,000 was raised for Macmillan Cancer Support and a great time was had by all. You can see a round up of the event in next month's issue.

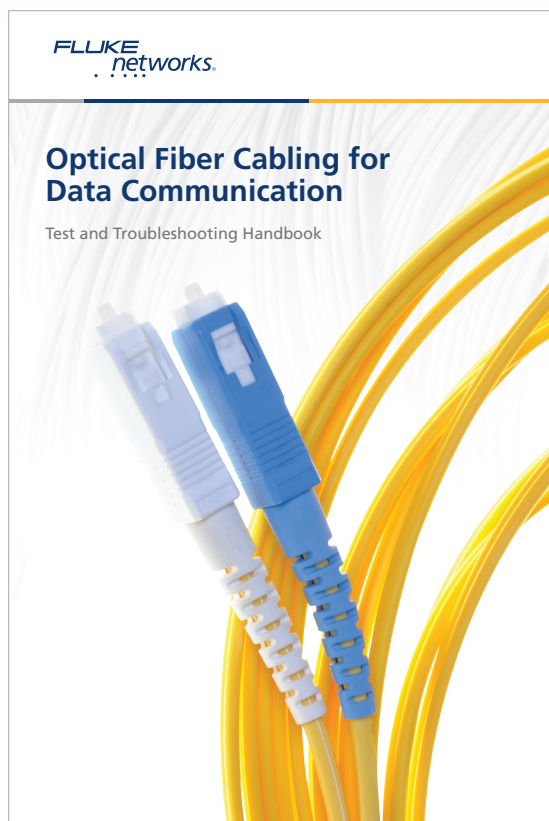
R. Shepherd

Rob Shepherd Editor



**Inside\_Networks**  
THE NETWORK INFRASTRUCTURE E-MAGAZINE

All our  
**OPTICAL FIBER CABLING  
FOR DATA COMMUNICATIONS**  
knowledge in one handbook! .....



Learn the fundamentals and best practices of how to inspect, clean, test, troubleshoot and document fiber cabling infrastructure installations.



ORDER YOUR  
**FREE** .....  
PRINTED COPY NOW!

[www.flukenetworks.com/emea-printed-fiber-test-troubleshooting-handbook](http://www.flukenetworks.com/emea-printed-fiber-test-troubleshooting-handbook)

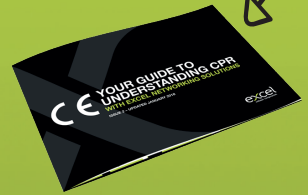


# Are you CPR-compliant?

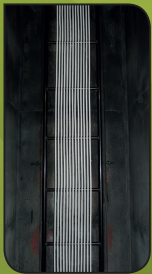
Excel has a range of compliant products across their copper and fibre cabling solution, coupled with a knowledgeable team who can help ensure that you get compliant cable at the right price.

These images highlight the importance of choosing an appropriately classified CPR-compliant cable by showing the difference in results between two classes of cable after a 20 minute vertical flame propagation test.

Download our  
Pocket Guide



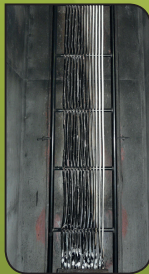
## Dca Example



Before Test

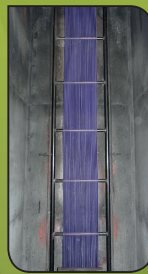


10 minutes

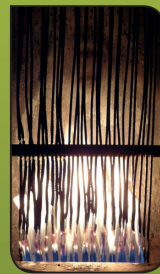


After Test

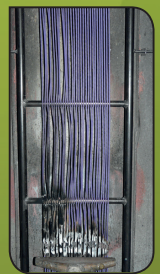
## B2ca and Cca Example



Before Test



10 minutes



After Test

## Take the Excel Challenge

Ask your suppliers and those offering to assist in writing tenders or specifications a few straightforward questions.

Request an  
Excel Encyclopaedia



**T:** +44 (0)121 326 7557  
**E:** [sales@excel-networking.com](mailto:sales@excel-networking.com)



Follow us on @ExcelNetworking

[www.excel-networking.com](http://www.excel-networking.com)

**excel**  
without compromise.

## Network Cabling Government Trailblazer Apprenticeship Scheme nears completion

The Network Cabling Government Trailblazer Apprenticeship Scheme is now near completion with just a few components left to sign off. Work is also underway on developing a Data Centre Technician Government Trailblazer Apprenticeship Scheme.

As it stands, anyone can declare themselves to be a network engineer or infrastructure integrator. The Certified Network Cable Installer (CNCI) education program, which awards both official certification and qualifications, is making some good headway into creating industry self-regulation, with specification within tender documentation, and endorsement from manufacturers and network cable installation companies. However, there is still some way to go to achieve positive recognition of ongoing learning and professional development and it is hoped that the two Trailblazer Apprenticeship

Schemes will help.

Dave Holden, chair of the employers group for the Network Cabling and Data Centre Technician Government Trailblazer Apprenticeship Schemes and Pinacl-GDA's operations director, said, 'With the lack of skilled resource in our industry the apprenticeship schemes will help support bringing youth in to the industry as well as having a government recognised qualification for a skill set that moves away from the more traditional manufacturer specific qualification structure.'

Andrew Stevens, CEO at CNet Training, added, 'The entire industry has been crying out for standardised learning and professional development for years. Achieving sustained quality will create a more confident future and will also help to attract talented individuals into it. The Trailblazer is ticking lots of boxes and is set to make a positive impact throughout the industry.'

## TIA receives ANSI reaccreditation in recognition of commitment to standards development

The Telecommunications Industry Association (TIA) has been reaccredited with the American National Standards Institute (ANSI) as a Standards Developing Organisation.

TIA has maintained a partnership with ANSI for 26 years. ANSI accreditation recognises continued excellence by TIA in the realm of standards and certifies that TIA is developing high quality standards that meet the needs of the industry.

'TIA is proud to have officially received ANSI reaccreditation in recognition

of sustained success in standards practices,' said TIA chief executive officer, Wesley Johnston. 'Standards play an essential role in the ever-shifting telecommunications landscape. Advancements in technology to date have allowed machines to communicate with one another to make our lives easier – standards are and will continue to be vital as this technology reaches new heights. TIA is at the forefront of this work, and quality is extremely important to us and our industry.'

# Inside\_Networks 2018 Charity Golf Day raises over £10,000 for Macmillan Cancer Support

The Inside\_Networks 2018 Charity Golf Day raised over £10,000 for Macmillan

**Inside\_Networks**  
2018 CHARITY GOLF DAY 23rd MAY

Cancer Support. This impressive sum was the result of fantastic industry-wide support and a great day's golfing at the prestigious Hanbury Manor PGA Championship Course in Ware, Hertfordshire, which was followed by a three-course dinner, prize giving, auction and charity raffle.

With main sponsorship once again provided by LMG, Excel Networking Solutions, Mills, Computacenter and CNet Training, 140 people and 36 teams turned out to make this year's event the best ever and it provided a welcome opportunity for all areas of the industry to

network.

Rob Shepherd, editor of Inside\_Networks, said 'The

number of people who participated this year was the highest ever in the history of the event and we reached full capacity very early on. As always, it was a lot of fun and being able to raise a considerable sum of money for such a worthwhile and important cause as Macmillan Cancer Support is a wonderful achievement. The event wouldn't have happened without such great support and I would like to extend my thanks to all the players and sponsors and, in particular, Andrew Stevens of CNet Training and Mark Cumberworth of Slice Golf and Events for making the event such a success.'

## R&M claims financial services organisations must plan headroom for high bandwidths and scalability

R&M is forecasting an investment boom in the financial sector. Banks, insurance companies and other financial services will have to renew their IT systems in the next few years to be equipped for the age of digitalisation.

Many banks and insurance companies in Asia and the Middle East are already equipped with state-of-the-art network solutions. In India, the market of LAN cabling recently witnessed double digit growth, particularly because financial institutes are upgrading their networks. An investment boom is looming large on the horizon in Europe. Worldwide, IT investments in the financial sector grew more than five per cent in 2017. These



are the results of analyses carried out by IDC. Gartner is also forecasting a worldwide investment volume of \$519bn for 2018 – an increase of 4.1 per cent.

'Financial services are currently focusing on modernising IT,'

states Andreas Rüsseler, chief marketing officer of R&M. 'New software and IT hardware alone are not going to be enough. Financial services have to think about higher categories of data transmission and fundamentally new LAN infrastructures. Banks that invest in secure and future proof cabling and network technology will save later on expensive retrofitting. Agility and scalability of the networks are essential to be able to offer innovative services at all times and to tap new markets.'



# DCA teams up with partners to work on EURECA

For the past 36 months the Data Centre Alliance (DCA) and seven of its strategic partners have been working on a joint Horizon 2020 project called EURECA. This represents the second of three projects the data centre sector has secured research funding for as a direct result of DCA involvement.

The EURECA project call came from the Horizon 2020 innovation and research programme dealing with the adoption of energy efficient best practice and market uptake of energy efficient products and services within Europe's public sector organisations. Although originally focused towards the public sector, the services developed will prove to be of value to the private sector, as they share the same challenges and are all equally looking for best practice guidance and independent support for their IT transformation projects – support which EURECA can provide. The project had to:

- Identify the major areas for innovation in public sector data centres.
- Develop a framework to support efficiency and innovation in a measurable and scalable way.
- Reach out to potential public sector entities that are likely to be interested in procurement.
- Engage with these entities to raise awareness of the importance of embedding energy efficiency criteria, as well as innovation in their procurement

processes.

- Support them throughout their procurement journey.

The EURECA consortium has now trained over 815 stakeholders through 10 face to face events across Europe, with many more stakeholders trained via an online platform. The EURECA team has also held over 14

knowledge sharing events in 10 European countries. The EURECA legacy will continue to be sustained and the benefits replicated through the online support platform created by the project, which includes tools, training material, case studies, and a dedicated marketplace, which already lists over 200 data centre energy efficiency related products and services.

Steve Hone, CEO at the DCA said, 'I would like to thank our fellow consortium partners for a job well done. This includes Mark Acton from CBRE, John Booth from Carbon3IT, Frank Verhaegen from Certios, Mark Andre Wolf from Maki Consulting, Jon Summers, and Zaak, Esther and Julie from Green IT Amsterdam, with special thanks to Rabih Bashroush and his team at the University of East London. This was a great team effort and a demonstration not only in the value of collaboration but also in the clear benefits a trade association such as the DCA can bring to the table. It demonstrates the benefits of working together, sharing knowledge and promoting best practice with the best interests of the whole data centre sector and the customers we ultimately serve at its heart.'



## Research details how higher chilled water temperatures can improve data centre cooling and energy efficiency by 64 per cent

Water chillers account for 60-85 per cent of overall cooling system energy consumption. Consequently, data centres are designed, where possible, to keep usage of chillers to a minimum and to maximise the amount of available free cooling, in which less power hungry systems such as air coolers and cooling towers can keep the temperature of the IT space at a satisfactory level.

One approach to reducing water chiller energy consumption is to design the cooling system so that a higher outlet water temperature (CHW) from the chillers can be tolerated while maintaining a sufficient cooling effort. In this way, chillers consume less energy by not having to work as hard, and the number of free cooling hours can be increased.

Research from Schneider Electric has outlined the various strategies and techniques that can be deployed to permit satisfactory cooling at higher temperatures, whilst discussing the trade-offs that must be considered at each stage, comparing the overall effect of such

strategies on two data centres operating in vastly different climates. It also looked at two real world examples of data centres in differing climates – the first in a temperate region (Frankfurt, Germany) and the second in a tropical monsoon climate (Miami, Florida). In each case, data was collected to assess the energy savings that were accrued by deploying higher CHW temperatures at various increments, whilst comparing the effect of deploying additional adiabatic cooling.

Victor Avelar, director and senior research analyst at Schneider Electric's Data Center Science Center, said, 'The study found that an increased capital expenditure of 13 per cent in both cases resulted in energy savings of between 41-64 per cent, with improvements in total cost of ownership between 12-16 per cent over a three year period. Additionally, it found that by reducing the amount of energy spent on cooling, each facility's Power Usage Effectiveness (PUE) was thereby improved. Overall, the Schneider Electric study found that PUE was reduced by 14 per cent in the case of the Miami data centre and 16 per cent in the case of Frankfurt.'



Victor Avelar

### NEWS IN BRIEF

Paessler has announced the appointment of Steven Feurer as chief technology officer (CTO).

RingCentral has been ranked first in IHS Markit's 2018 North American Unified Communications as a Service (UCaaS) Scorecard.

Siemon was awarded with the Cabling Vendor of the Year Award at the Network Middle East Innovation Awards in Dubai.



**No Compromise.**  
The only intelligent  
PDU you will ever need.

[Learn More](#)



# Let's get serious

Hi Rob

Not a day goes by where we aren't warned about the increasing dangers posed by cybercriminals, our own staff and the dangers of failing to prepare strategically for this.

According to a survey released by Arcserve, less than 15 per cent of businesses have a high degree of confidence in recovering their data should downtime or a disaster event occur – something I found quite startling when you consider those surveyed were channel partners, service providers and IT pros.

Of course, it's common knowledge that today's IT teams are asked to do more with less, but it was interesting to note that survey respondents suggested IT resources were less of a concern than costs associated with downtime, the complexity of managing on-premises, virtual and cloud data, and ransomware events.

When the question was put to them, asking about their position in terms of

their top five data protection concerns, 'managing varied data and systems' came out on top, with 37 per cent more than 'insufficient personnel' or 'budget'.

Such answers tell us much about where businesses are focusing their crosshairs these days, but are they doing enough given the new dangers they face? The figures suggest not. Indeed, rather than showing signs of a decrease in terms of businesses affected, downtime is on the up, buoyed by new threats like ransomware.

Ransomware attacks could potentially be hitting a business every 14 seconds by the end of 2019. If that's true then it will represent a massive spike on this year's statistics of an attack every 40 seconds. That's why businesses must quickly align their strategic thinking and make 2018 the year to implement sound disaster recovery plans that will successfully protect their data and that of their customers. It seems that companies do understand the urgency

## Rittal – The System.

Faster – better – everywhere.



# IT infrastructure from smallest to largest.



ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

of mitigating risk from downtime and ransomware attacks, but the key challenge in successful disaster recovery planning lies in the complexity of their varied infrastructures and not necessarily the lack of IT resources.

Some of those selling data protection solutions are backing into support for cloud and physical systems solutions that were specifically designed for one environment. While these systems were bought with the best of intentions with an eye on simplifying or reducing costs, they've actually ended up creating more complexity around that process.

Rather interestingly, the Arcserve survey revealed while the top IT concern was consistent across channel partners, service providers, and end users, what they look for in a data protection vendor illustrates a different reality. Partners overwhelmingly ranked brand name, or market familiarity, as one of their top three criteria when evaluating a vendor. In contrast, end users stated this to be the least important factor when purchasing a data protection solution.

For end users, ease of use and

deployment were the number one purchasing considerations, closely followed by total price and integration with database applications. This points to businesses being willing to pay more for a data protection solution that is easy to deploy and manage over one that is priced lower and may require more extensive training.

When you consider that over one third of businesses now suggest that just one hour of data loss could put them out of business, isn't it about time we started treating this a little more seriously?

**Richard Massey**  
Arcserve UK

#### Editor's comment

The answer is definitely 'yes'. Quite frankly, the survey findings that Richard references are shocking, not least of all because data protection is such a hot topic at the moment. While complying with legislation is one thing, protecting a business from the potential catastrophe of prolonged data loss should be much higher up the corporate agenda.



# The heart of the mat

Hi Rob

The process of digital transformation is in full swing – at least half of global value creation could be digitised by 2021, according to a forecast by IDC. Faced with high electricity costs, it is becoming increasingly important for companies to modernise the IT landscape and make data centre operations more efficient. Managed cloud services, edge computing and direct current in the data centre shows which technologies are most suitable. The aim is to make ongoing operations cost effective and future proof.

Hybrid multi-cloud environments will dominate future IT agenda. According to IDC, more than 90 per cent of companies could already be using multi-cloud platforms by 2021. There are many reasons for this. For one thing, there is no one-stop cloud provider that can meet all the requirements, since complete cloud stacks always come from multiple providers. Moreover, performance, latencies, compliance and risk management often have to be implemented individually, sometimes with different cloud providers.

In the future, besides expanding central data centres, many companies will be focusing more intensively on establishing decentralised IT capacities. Here, the driving forces include modern Industry 4.0 Internet of Things (IoT) applications – due to the automated production facilities installed there, a large amount of sensor data has to be processed on site in real time. Data transfer to a central data centre

would delay real time processing and overload networks and legacy systems. However, many other IoT scenarios also need extra data centres. These include networked households and smart homes, wearable fitness trackers and smart watches, as well as networked cars and IT infrastructures in smart cities.

In addition, the new 5G mobile standard will drastically increase the volume of data needing processing. Anyone wanting to run IoT infrastructures in future rapid fast 5G networks should also ensure that the server performance required is provided at an early stage, so that applications can use the full network capacity. Edge data centres are used for





# ter



this purpose – they enable the rapid and decentralised establishment of IT infrastructures.

But what makes an edge data centre stand out? In fact, these are turnkey IT environments, which are modular and scalable as rack or complete container solutions. The existing expansion options make these solutions suitable for companies of all sizes. Since the components for cooling, power supply, monitoring and security are pre-installed and coordinated with each other – an edge environment can be created very quickly.

However, central and homogenous hyperscale data centres will still be needed. Operators of such systems are faced with the question of how to optimize the future running costs of their plants. Data centre racks provide one solution for greater energy efficiency – two IT rack standards have become established on the market in the shape of

Open Compute Project (OCP) and Open19. Inside the IT rack, only one central power pack supplies the active IT components with DC power. This cuts about five per cent of the energy costs of each rack.

Alternative energy and cooling concepts are also important in further improving operating. Providers can achieve very favourable operating costs with electricity from renewable energy sources, with air or seawater cooling and flexibly with service models.

Energy recovery is another IT cooling concept for higher efficiency. This uses the waste heat generated in the data centre for building climate control purposes, in order to heat hot water. The technology itself is not new, but the aim is to develop a long-term strategy that exceeds the usual return on investment calculation of three to five years. To this end, it would be necessary for the, in order to give the energy revolution the new impetus that the IT and telecommunications industries need.

**Clive Partridge**  
**Rittal**

### Editor's comment

The move towards digital transformation is both exciting and highly disruptive. As Clive outlines, it is challenging many traditional methods of configuring data centres and, as there is still some way to go, much could still change.

# Best practice labelling

Professional network  
infrastructure label printer

[brother.co.uk](http://brother.co.uk)

When you choose a Brother PT-E550W label printer, you choose the best; with fast printing and wireless connectivity, plus in-built symbols and templates, you're guaranteed to be more productive on-site.

A wide range of durable, laminated tape colours and widths make it perfect for a range of uses including cable identification, patch panels, outlet points and warning signage.

**Order today from your  
preferred Brother Supplier**

**COMTEC** ▶

**Mills**  
milsted.com

**MGN**  
Home Office Networks

Integrates with:


**LinkWare Live**

Via iLink&Label app:



# Coming of age

As the data centre sector matures, so are the facilities that form it – with a growing number of them now over 15 years of age. [Inside\\_Networks](#) has assembled a panel of industry experts to discuss the implications of this and to find out what should be considered a priority when upgrading

 Although estimates vary, it is now thought that a significant number of the world's data centres are more than 15 years old. Given that it is often considered a 'new' industry, this is something of a

viable logistically or financially, so many owners and operators are faced with making some tough decisions about what to replace and how to ensure uptime while they do it.

WITH A GROWING NUMBER OF DATA CENTRES USING EQUIPMENT THAT IS OVER 15 YEARS OLD, WHAT CHALLENGES DO OWNERS AND MANAGERS OF THESE FACILITIES FACE IN TERMS OF KEEPING THEM UP-TO-DATE, AND WHAT SHOULD TAKE PRIORITY? THESE DAYS, HOW LONG CAN A BRAND NEW DATA CENTRE EXPECT TO BE FIT FOR PURPOSE WITHOUT AN EXTENSIVE REFIT?

milestone – one that isn't necessarily welcome.

Why? Put simply, the older data centres become the more they need doing to them to keep them as up-to-date as they need to be. The trouble is that not only can this prove disruptive, especially when it comes to infrastructure moves, adds and changes (MACs), it can also be hugely expensive to keep replacing equipment.

A data centre that was designed and constructed over 15 years ago will struggle to keep up with modern demands. Furthermore, simply ripping out and replacing all at once is, in most cases, not

For some the major dilemma is whether to invest in mechanical and electrical infrastructure in order to raise power capacity, or spend the money on energy reduction measures such as cooling. Others, however, will believe that hardware and server upgrading are the number one priorities. So, what should take priority? Inside\_Networks has assembled a number of industry experts to give us their views and offer some advice.

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

## JOHN BOOTH

MANAGING DIRECTOR AT CARBON3IT

Back in the distant past, I attended a seminar where one speaker said that the rule of thumb was that a data centre building should last for 65-75 years, the mechanical and electrical (M&E) infrastructure for 20-25 years (thus three major refits) and the IT for 5-7 years (thus between 10-13 replacement cycles) I don't subscribe to that view.

There was a boom in data centre construction in the late 1990s and early 2000s, and many facilities need capital plant replacement.

However, I think we need to make a distinction between enterprise and colocation data centres in terms of capital equipment such as chillers, computer room air conditioning (CRAC), UPSs and generators.

Colocation data centres will, in the main, be aware of the lifecycle of capital plant and will have made line entries in budgets for the replacement of the equipment. Enterprises, however, may not have and could face a funding struggle or be asked to keep the equipment going for a few more years – with all the risks that such an approach entails. In both cases, the real problem comes with the actual physical nature of replacement – detailed planning will be required, logistics, removal, replacement and all the while maintaining services. After all, isn't that what the industry provides – 24/7/365 operation?

In terms of priority, the principle factor is how well the items have been maintained

and the associated test schedule. Regular servicing is guaranteed in colocation sites but perhaps not so prevalent in enterprises. UPS and batteries are, in my opinion, the

most important items, as they provide the energy for everything else to run. Essentially, providing data centre services is rather like maintaining a car – if you don't service it, you will face problems down the line.

To answer the final part of the question, we'd have to define what type of data centre it was, but I'd say a brand new data centre can expect to be fit for purpose without an extensive refit for 15 years. After that you

will need to think about adopting the latest technologies and thinking.

With the growth of cloud/hosting services you could argue that data centres should be largely built for obsolescence. We can replace them with edge or new modular facilities with the latest kit and migrate services over the wire to them. If not, we can use software defined data centres and other load balancing data management techniques, where data and processing is present in multiple locations and if one facility fails it doesn't impact any customer.

**'Providing data centre services is rather like maintaining a car – if you don't service it, you will face problems down the line.'**







# eight reasons for CATEGORY 8



**NEW CATEGORY 8** cabling and connectivity provide huge benefits in data centres. Learn about the eight ways an RJ-45 based Cat 8 system creates a robust infrastructure for today's network needs and prepares you for future network demands.

Learn more at [Leviton.com/8reasons](https://leviton.com/8reasons)



# CONNECTED

## Better visibility for a more resilient edge

### Mitigate risk at edge deployments with the innovative Connected Smart-UPS with APC SmartConnect

Connected Smart-UPS™ with APC™ SmartConnect is like having a small army supporting your power protection.

The new cloud-enabled Connected Smart-UPS now boast an ingenious remote monitoring feature that makes the legendary Uninterruptible power supply(UPS) even more adaptable and easier to deploy. It allows you to monitor your UPS online – anytime– anywhere through any internet connected device. Proactive alerts provide the insight into critical power and helps to identify potential issues before they become costly problems for anyone. These notifications and cloud-based monitoring can enable a more resilient Edge infrastructure.

#### Certainty in a Connected World



Read our research and discover why visibility is critical for resiliency at the Edge landscape.

[apc.com](https://apc.com)

Life Is On

**APC**  
by Schneider Electric

## ALBERTO ZUCCHINALI

DATA CENTRE SOLUTIONS AND SERVICES MANAGER AT SIEMON

Today, data centre facilities that run 15+ year old equipment are facing several challenges. One concern is the data centre networking architecture, which is transitioning from a multi-layer switching to a spine-to-leaf architecture to enable lower latency and greater bandwidth. Consequently, this shift requires management of multiple cross-connecting zones and cabling to cover longer distances between access and interconnection.

Another challenge relates to 'everywhere data', where data today is stored in different places – some locally and some in the cloud. Data centre networks are required to exchange this data to and from the cloud, and often with extremely low latency requirements.

In addition, many older facilities don't feature automated systems for supervision and control, but instead are still being managed manually – a process that comes at extremely high costs. As automated systems will help meet the required quality of service (QoS) levels, their introduction is

becoming a high priority task.

When we look at data centre power consumption, lowering the Power Usage Effectiveness (PUE) score remains an important task, along with the need to reduce power consumption levels and the

amount of cooling dedicated to the active equipment.

The possible transition to hyperconverged systems is a great opportunity to activate multiple virtual servers and other services on the same physical equipment, reducing the required units in each rack and enabling a very modular growth based on a pay-per-need approach.

In all cases above, an obsolete infrastructure

will greatly reduce the opportunity to implement new systems and introduce edge performance equipment, which helps facilitate flexibility to increase rack density and grow infrastructure as and when required. In the case of existing data centres, a gradual move into new generation systems would provide some transitioning area and then a better chance to comply with the latest application requirements.

If data centres are properly designed and built with future proof solutions – particularly on the physical infrastructure layer – they can serve for 10 years. This means they can support two to three generations of active equipment and deliver the required amount of bandwidth, speed, power and cooling, as well as supervision and control, whilst avoiding expensive downtime, even in the event of unexpected system failures.



**'An obsolete infrastructure will greatly reduce the opportunity to implement new systems and introduce edge performance equipment, which helps facilitate flexibility to increase rack density and grow infrastructure as and when required.'**

## ANDY HIRST

TECHNICAL DIRECTOR AT SUDLOWS

Many data centres are getting to an age where even chief financial officers are starting to raise their eyebrows about reinvestment.

Given the potential benefits that the latest technologies can offer in the way of a return on investment, and the fact that the data centre managers are tired of the sleepless nights due

to the growing operational issues that such aging technology and a lack of resilience, its clearly the time to address this.

The good news is that within the last five years data centre technologies have really undergone a major evolution by taking efficiencies, resilience and sustainability to a new level, and now offer some significant engineering advances.

The bad news is that whilst the latest technologies can demonstrate a great improvement, facilities that are of this age have usually been designed and fitted out, often without forethought, so that there is often little or no resilience designed in to physically enable new equipment to be swapped out without an element of pain or even potential downtime.

Whereas today's facilities are designed to operate from a minimum of N+1 up to N+N and beyond, with A and B diverse supplies and routes with an entry level Tier 2 to Tier 3 – and, in some cases, Tier 4 – solution, 15 years ago this was not as common as perhaps it should have been. That said, at Sudlows, we have upgraded multiple data centre infrastructures and even though some facilities are technically more

challenging than others, there is always an engineering solution to swap out legacy technology with minimal downtime.

As far as what takes priority once a business case is put into place, a carefully designed phased programme to upgrade infrastructure is essential. This will usually start with identifying the legacy equipment that has the most immediate concerns, from a failure point of view, all the way through to calculating

what is the highest efficiency saving.

One thing for certain is that by carrying out the due diligence on which equipment to use, it is very important to be as vendor neutral as possible. The reason for this is that often we see equipment and manufacturers that, although very innovative over the previous few years, have not continued to invest in research and development projects, and have quickly fallen behind the leading efficiency and resilience curve.

One final question – once you have carried out the open heart surgery on the existing data centre, how long will it be before the technology you have installed is superseded and you are looking at your next upgrade? At the speed technology is currently being developed it won't be 15 years, that's for sure.

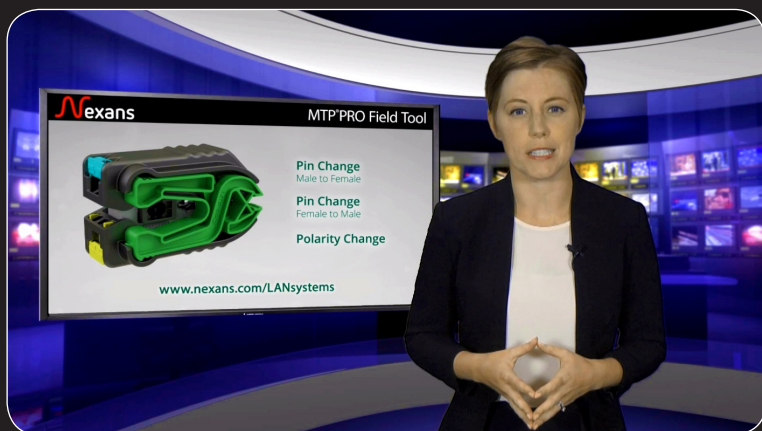


**'Within the last five years data centre technologies have really undergone a major evolution by taking efficiencies, resilience and sustainability to a new level.'**



# MTP PRO – fibre connector

Solving polarity & gender issues in Data Centres



**More about  
MTP PRO**

**Watch  
Webinar**

**Data Centre  
solutions**

**News**

Nexans Cabling Solutions UK  
2 Faraday Office Park  
Faraday Road, Basingstoke RG24 8Q  
Tel: 01256 486640 / [ncs.uk@nexans.com](mailto:ncs.uk@nexans.com)  
[www.nexans.co.uk/LANsystems](http://www.nexans.co.uk/LANsystems)

**Nexans**  
BRINGS ENERGY TO LIFE

# the workhorse has evolved

## The **Evo** Range from Assynia®

Cost effective copper  
networking solutions for  
professional installers

Become an Assynia® accredited  
installer and benefit from...

- ✓ Access to training facilities
- ✓ Technical support
- ✓ Free training scheme
- ✓ Exclusive pricing



Email our team at [sales@cmsplc.com](mailto:sales@cmsplc.com)  
or call 01252 379 379

available  
exclusively at



[www.cmsplc.com](http://www.cmsplc.com)

 **assynia**®  
**evo**

## ALEX RABBETTS

MANAGING DIRECTOR AT THE EUROPEAN DATA CENTRE ASSOCIATION

Many data centres that were built at the height of the dotcom period are now operating with old plant that may be near to end of life. Most were not designed with any consideration of what might be required when the plant reached end of life.

Live refurbishment of a data centre is challenging to say the least. This is particularly true of any data centre that provides services to customers. Getting all of the customers to agree on a window for a major upgrade is incredibly difficult and, even if this can be done, the data centre can't be taken down, so customers will inevitably be placed at risk whilst resilience is reduced.

The only alternative is to migrate customers into another part of the facility that won't be affected or to another facility altogether. The problem with migration is that there are very few specialists out there who can manage a data centre migration to minimise – or even eliminate – downtime.

Data centre migration is one of the most complex and risky activities any consumer of IT can undertake. It requires an in-depth knowledge of the technology to be moved in addition to a detailed understanding of the mechanical and electrical environment. So many 'experts' think that a data centre migration is just a 'lift and shift' and, in my experience, this is the number one reason

why many migrations fail. A data centre migration is 90 per cent planning and only 10 per cent doing.



15-20 years ago data centre construction was often regarded as a big mechanical and electrical (M&E) project and design was led by M&E consultancies – that is completely the wrong approach. Using people to design a data centre who have absolutely no understanding of the technology they are there to support is exactly why many data centres find themselves in the position that they do today.

Brand new data centres should be designed in conjunction with people who understand the technology that will be installed within them. The industry is maturing and part of that maturing process is for owners and operators to review how the data centre is designed and by whom. If done right, they will never reach end of life.

**'Using people to design a data centre who have absolutely no understanding of the technology they are there to support is exactly why many data centres find themselves in the position that they do today.'**

## CARRIE GOETZ

GLOBAL TECHNOLOGY DIRECTOR AT PAIGE DATACOM SOLUTIONS

The two key factors to replacing equipment are finding the right window for maintenance and/or replacement, and planning for the replacement. This is even harder in facilities that are cramped and not concurrently maintainable.

In fact, it is this window – or lack thereof – that can lead to a data centre being relocated, as major works in a cramped live environment are not ideal. Although replacing end of life equipment or failed equipment both have challenges in time, it is vital to schedule and assure uptime during the upgrades or repairs.

I did some checking and found one manufacturer that has an in-situ upgrade for chillers that triggers a new serial number, new warranty period and new depreciation schedule. But, unfortunately, only one.

Newer data centre designs with service corridors and available room helps, as new equipment can be installed and the older equipment can be phased out. However, for older sites with limited space and means to do an install, a swing centre or swing equipment may be necessary. Planning is a step that does not need to be skipped or occur in a vacuum.

Today, many data centres operate with

hot spare sites or at least hot spares for critical applications. The edge will likely

provide additional relief for some applications, while some can be clouded permanently or temporarily. The trick is going to be scheduling the proper maintenance window.

Applications are more resilient than ever, and if upgrade plans include IT and the applications folks, chances are the upgrades can occur with limited to no loss to data or apps. There are few problems that cannot be solved by involvement of the right team – meaning everyone that has an

interest in the data centre operations, not just facilities.

Plan now or pay later – planning should start well in advance of repairs.



**‘The two key factors to replacing equipment are finding the right window for maintenance and/or replacement, and planning for the replacement. This is even harder in facilities that are cramped and not concurrently maintainable.’**





# Made to connect.

Connecting business and residents in cities, towns and rural locals on a global scale.

HellermannTyton provides a complete end to end range of FTTx solutions, delivering flexible fibre connectivity across every stage of the last mile network.

The comprehensive range of street cabinets, fibre splice closures, MDU enclosures, customer connection points and wall outlets have all been designed to drive quality and high performance connectivity in both residential and commercial applications.

[www.htdata.co.uk/competences/markets-and-industries/fibre-to-the-x-fttx](http://www.htdata.co.uk/competences/markets-and-industries/fibre-to-the-x-fttx)





## Netscale Solutions

Delivering the highest  
fibre density

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

For more information and further details about the highest 10/40/100GbE density of any fiber solution out there, visit [www.rdm.com](http://www.rdm.com)

**Reichle & De-Massari UK Ltd**

+44 (0) 203 693 7595



## SIMON BEARNE

COMMERCIAL DIRECTOR AT NEXT GENERATION DATA

Every data centre will eventually need a refit. The technical evolution of M&E plant will eventually drive older plant obsolescent, even if it is still operable. However, plant evolution is gradual and, in most cases, properly architected and maintained plant can remain fit for purpose well in excess of 15 years.

Some operators take a short-term view – seeking to maximise profit and exit, whilst others lack the resilience in their infrastructure to support concurrent maintenance, or lack a rigorous preventative maintenance regime.

A long life starts with a highly duplicated plant architecture that supports

concurrent maintenance with minimal risk to customers. Without this, thorough lifecycle maintenance is problematic. Taking inclusive original equipment manufacturer (OEM) maintenance packages alongside procurement is also key. Plant manufacturers are focused on new equipment sales, so the operator challenge is to drive OEMs to provide long-term support as a combined package in partnership.

Data centre lifecycle maintenance is similar to aircraft – a full regime requires detailed and continuous test, inspection and replacement. This involves regular replacement of capacitors, fans and batteries, through to stripping and greasing breakers, and even high tech thermal imaging and component testing for minute flaws. The extent this is taken on by

operators varies.

Operating parameters have an influence on lifespan and mean time between failure. Best practice is to avoid high load factors either due to lack of resilience or selling to maximum capacity – operators are gradually beginning to understand the balance between financial returns,

service continuity and reputation. Best practice extends also to operating exactly within OEM stated environmental parameters.

Ultimately, the time comes to refit. This does not mean customer exodus to a shiny new alternate site. It involves thorough planning with customers, coupled with provisions for parallel

build, logistics support and swing space. Larger facilities have the advantage of having free space for refit and generally built their plant gradually, so the refit is gradual.

Customers evaluating the in-house option should bear in mind all that it takes to deliver long-term reliability, and when considering third party data centres should include detailed maintenance in their buying criteria, as there is enormous variation between operators.



**‘Data centre lifecycle maintenance is similar to aircraft – a full regime requires detailed and continuous test, inspection and replacement.’**



# ENHANCED DATA CENTRE INFRASTRUCTURE

Whether you are in the process of designing a new data centre or retrofitting a current one, Eaton has the engineering expertise and solutions to help create an efficient, safe and reliable data centre. Speak with Dunasfern Inc. Auriga about your solution.

## Eaton DRS Series Rack

- o Helps reduce installation times for active & passive infrastructure with its open architecture form & design features such as tool-less adjustment of 19-inch rails
- o Reduced remediation times reducing costs for adds / moves / changes, ultimately reducing TCO
- o Designed to allow the optimisation of air management inside the rack envelope lowering OPEX

## Eaton Intelligent Power Management Infrastructure

IPM Infrastructure – simplified infrastructure monitoring for software-defined data centres.

The Intelligent Power Manager (IPM) Infrastructure from Eaton radically simplifies critical power, energy consumption and environmental monitoring in data centres.

## Eaton Power Protection

- o Ensure mission-critical applications uptime
- o Integrates with VMware's vCenter Site Recovery Manager & provides load shedding capabilities at the VM level
- o Battery charging technology extends battery service life by up-to 50 percent\*



## Eaton Power Distribution Unit

- o Simple fitting and mass configuration
- o Integrated plug retention
- o Personalised threshold alarms on power events
- o Initiation of disaster recovery policies in virtual environments on PDU alarms



\*50% extended runtime on single phase only



**DUNASFERN**  
Inc. **AURIGA**

**EATON**

*Powering Business Worldwide*



## Siemon's Digital Lighting Partner programme brings low voltage business opportunities to installers

Siemon has developed and enhanced its Digital Lighting Partner (DLP) programme, which is uniquely designed to deliver business opportunities to a network of Siemon installers by leveraging key industry partnerships and growth in the development of intelligent buildings.

Siemon's Digital Lighting Partner programme is specifically designed for network and low voltage (LV) cabling installers to help them leverage and further expand their knowledge of IP network deployment and become a go-to expert in the PoE lighting space.



Installers joining Siemon's DLP programme will benefit from specialised training with remote or onsite sessions and access to a vast pool of educational resources including webinars, white papers and technical guides.

Lee Funnell, head of Technical Services Group for Europe, Russia and Africa at Siemon, stated, 'We take great pride in our partnerships and we feel this approach creates most value for customers by leveraging the innovative offerings from the ecosystem of partners that we can pool together to offer truly unique solutions for sustainable smart buildings now and in the future.'

## Cerberus Systems proves data cable terminations are right first time with Ideal Networks

The speed and accuracy of terminating Category 5e and Category 6 data cables with RJ-45 plugs has been improved for Cerberus Systems thanks to the FT-45 from Ideal Networks.

The type of installations Cerberus Systems performs often requires technicians to install RJ-45 plugs at the end of links which connect directly to CCTV and access control systems. Field-terminated RJ-45 plugs are prone to installation errors because they require the installer to trim the conductors to a precise length prior to placing the plug on to the cable. If they are too short, there will be open circuits discovered when testing, and if they are too long, terminations look

sloppy, or performance can suffer when pairs are exposed outside of the plug body/cable jacket.

Tim Widdershoven, global marketing

manager at Ideal Networks, said, 'The new FT-45 solution speeds up and simplifies termination of RJ-45 plugs by eliminating the need to precisely trim conductors to length before inserting the cable into the plug.'



Unlike the plugs with closed ends usually used for RJ-45 connections, the FT-45 feed-thru modular plugs feature open channels that allow the conductors to be fed completely through the connector before crimping '

# CNet Training announces first UK licensee for CNCI

Total Network Solutions Europe (TNS Europe) has been announced as the UK's first Licensed Education Partner for CNet

Training. TNS Europe is licensed to deliver the 10-day Certified Network Cable Installer (CNCI) program at its purpose built training centre in Newcastle-under-Lyme, Staffordshire. Having this additional location means the CNCI will be more accessible and commutable for learners.

The CNCI is dedicated to providing cable installers with everything they need to confidently and accurately prepare, install, test and certify copper and fibre cabling systems, specifically for those wishing to demonstrate the highest levels of knowledge, skills and expertise in network infrastructure. Successful completion provides level three BTEC



qualifications, official CNCI certification and eligibility for an Electrotechnical Certification Scheme (ECS) Datacomms Specialist card – required

to allow individuals to work on-site.

TNS Europe's managing director, Paul Forster, said, 'I very much look forward to delivering the CNCI. The content of the program is constantly kept up to date with the ever-changing industry, making it second to none.'

Martin Smith, international lead network infrastructure at CNet Training, added, 'The CNCI is becoming increasingly popular and the demand is driving the opening of more dedicated education centres across the UK and Ireland. TNS Europe has the experience and expertise we are looking for and further CNCI education centres are planned for the future.'

## CHANNEL UPDATE IN BRIEF

R&M has acquired Transportkabel – DIXI a.s. (TK DIXI), headquartered in Děčín, Czech Republic. The company, founded in 1996, is a premium developer and manufacturer of fibre optic and metallic cables for power and communication applications in data centres, broadband networks, enterprise buildings and other infrastructure projects.

RingCentral has announced a new software defined wide area network (SD-WAN) certified partners program with several industry leading providers including VMware, CloudGenix, Riverbed, Cradlepoint, Windstream Enterprise and GTT Communications.

At NEC's EMEA Partner Conference 2018, held in Noordwijk, the Netherlands, the company awarded its top performing business partners addressing the enterprise ICT market for their excellent performance over the past year. The three-day conference brought together NEC's major distributors, key business partners and solution partners from over 40 countries across EMEA. the development of new client markets in Asia and the United States.



IT'S IN OUR DNA.

Sudlows has been providing infrastructure and technical services to companies like yours for over 100 years. Call **0800 783 5697** or email [hello@sudlows.com](mailto:hello@sudlows.com) to discover more about what we can do for you today, tomorrow and for the next 100 years.

[www.sudlows.com](http://www.sudlows.com)



CRITICAL INFRASTRUCTURES



ENTERPRISE SERVICES



FIBRE SPECIALISTS



ELECTRICAL SERVICES



BUILDING SERVICES



FACILITIES MANAGEMENT

# Do the twist

James Withey, liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3, explains the recent developments in copper cabling standards and applications



▶ Since the first days of computer networking, industry soothsayers have gathered around their crystal balls and prophesied the future of cabling media. Predictions that optical fibre would replace copper, or that one type of fibre would dominate over another, have all fallen in front of the overwhelming development of applications whose advantages draw upon the strengths of a certain media type or configuration. When combined correctly, a range of cabling media types will provide the best performance and opportunity.

## WITH GREAT POWER COMES...

Perhaps the most obvious example of this was the introduction of remote powering, introduced back in 2003 with IEEE 802.3af (15.4W), which reminded us that even if copper cabling could not carry the same blistering data rates as singlemode fibre, it had other advantages.

Now copper cabling could also be used to power the far end device from the same cable that carries the data, allowing for easier installation of devices around the premises. The uptake was instant, and power over Ethernet (PoE) moved



forward, first to IEEE 802.3at (30W), and now to IEEE 802.3bt (90W), which is due for publication in mid-2018. These higher supplied powers can support a much wider range of devices, and bring with them the need to plan and manage the heating caused by the current flow on the cabling.

## THE HEAT IS ON

The heating caused by power on cabling causes the attenuation of the cable to increase and results in both a reduced drive length and the need manage the thermal rise. This is an area where relevant standards groups are producing guidance and requirements to help the premise owner plan and run powered cabling system.

ISO/IEC TS 29125, and the Telecommunications Industry Association (TIA) equivalent – TIA TSB 184-A – provide detailed guidance of the thermal rise within the cabling in variety of installation conditions. The ISO/IEC 14763-2 Planning and Installation standard is also being

revised to require consideration of these issues prior to new installations or refurbishments of cabling.

Active management of the power within the cabling is also being addressed with a new project to develop an amendment to the ISO/IEC 18958 automated infrastructure

management standard (AIM). This amendment will combine data about

length and resistance from test instrumentation, with information about which cable and cable bundle the power is being delivered on, to help manage power consumption and minimise thermal rise.

With such focus on power delivery, it may seem incongruous that work is being done to update these ISO/IEC and TIA powering guidelines to include considerations for 28AWG cabling, as these smaller diameter cables heat up more. In particular, as the upcoming TIA 568.2-D (due mid-2018) standard specifically adds 28AWG cabling to its scope, it is especially important that the standards advise of the limitations to the design and operation of a powered network that are inherent with the use of 28AWG cabling.

## THE NUMBER IS ONE

Developing the right media for the latest IEEE applications has often meant pushing the upper frequency limits of the cabling, and with each step from Category 5e to

Category 8 the frequency of cabling rose from 100MHz to 2000MHz.

Not all new IEEE developments were focused on those same objectives, and projects aimed at the automotive industry quietly

**‘The developments in standardisation don’t only relate to the applications that communicate over the channel or the media, but they can also provide new topologies, or recognise those that have been in common use but not yet standardised.’**

began working on single pair cabling that would reduce the weight and expense of

automotive wiring harnesses. Whilst some in the industrial cabling sector were taking note of these projects, the lack of reach – typically 15m – provided little application to commercial premise installations.

That was to change with launch of IEEE 802.3cg 10BASE-T1L early in 2017. This introduces single pair cabling to support 10Mb/s, at lengths of up 1000m, allowing for support of range of Internet of Things (IoT), building automation, signalling and sensor applications. The cabling groups immediately started to introduce this into their own standards, with the TIA beginning work on 568.5-D, which will add generic single pair cabling to their recognised media types.

## SINGLE LIFE

ISO/IEC has begun work on both a technical report to cover application specific uses of single pair cabling and a new generic cabling document for single pair, both within the ISO/IEC 11801 series of standards. In both cases the cabling standards are in the process of selecting a new single pair connector, making this the first twisted pair cabling standard in many years not to reference the RJ-45 connectors.

The 10Mb/s limitation of 10BASE-T1L means that single pair cabling does not replace traditional four pair cabling, but

can be used to complement and extend the four pair network to low data rate devices that would no longer require four pair cabling.

Some, including me, may ask if a single pair application might ever be developed that could reach 100m at a higher capacity than 10BASE-T1L. It would require more soothsayers to answer this,



but consumer feedback and the adoption rate of 10BASE-T1L would certainly form part of the consideration for such future possibilities.

## MISSING LINK

The developments in standardisation don't only relate to the applications that communicate over the channel or the media, but they can also provide

new topologies, or recognise those that have been in common use but not yet standardised.

Such an example is the modular plug terminated link (MPTL), which is being introduced with the publication of TIA 568.2-D. This configuration occurs when a device such as an LED light fixture, security camera, building automation

control, or Wi-Fi access point is located in an inaccessible location such as a ceiling space, where it is not practical to install a faceplate outlet. Instead, there is just one patch cord in the telecommunications room and the permanent link is terminated at the other end with a plug so it can plug directly into the device, making it an MPTL. This essentially eliminates the equipment cord.

Up to the introduction of the MPTL, this was an unrecognised configuration and as such had no performance requirements, or any way to assure the conformance of the installation. The TIA update provides requirements for this, and ensures that the plug portion of the MPTL is included in the conformance criteria.



## CONSIDER YOUR OPTIONS

With new applications like 2.5GBASE-T and 5GBASE-T, developed to function on existing cabling classes, new media like single pair cabling and higher power delivery systems, a vision of the future copper cabling emerges that is more nuanced than simply increasing bandwidth and capacity. When it comes to cabling, there is no 'one size fits all' and generic

cabling should be carefully selected based on the requirements of where it will be used within the network. With the overwhelming trend to see more applications converge on the Ethernet network within the building, it is even more important to consider all the diverse use cases that occur within today's cabling installations. ■



### JAMES WITHEY

James Withey is a senior engineer at Fluke Networks. He has 20 years of experience in testing of cabling systems and has been involved with most international standard bodies including TIA, ISO/IEC and IEEE. He is the liaison officer between IEEE 802.3 and ISO/IEC SC25 WG3.

## 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 solutions, such as the 0.5U patch panel and reduced diameter cabling.

When an Excel Cabling Partner installs



a system, a **25 year warranty** can be awarded, covering 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 **A5 catalogue**.

More details about Excel Networking Solutions and its full range of products are available by **CLICKING HERE**.  
[www.excel-networking.com](http://www.excel-networking.com)

## Corning Optical Communications & Blue Helix

Fires feature in the mainstream news with somewhat disturbing regularity and recent tragedies make alarming headlines.

There were little in the way of comparable global flammability standards until July 2017. At that point requirements were put in place throughout Europe, when a fire rating and CE marking became mandatory for indoor cables under the Construction Products Regulation (CPR).

The result for cable manufacturers is that anyone producing communication cables for the European market must test, classify and label products according to standards. Testing must be performed by



an authorised body under the main criteria of flame propagation and heat release, smoke opacity, droplets falling during combustion and smoke acidity.

For this initiative to succeed

regulations must be diligently enforced, ensuring the use of high performance B2 and C rated products for high fire risk buildings.

Corning has embraced the new regulations and full data sheets are available by **CLICKING HERE**.  
[www.corning.com/emea](http://www.corning.com/emea)  
[www.bluehelix.co.uk](http://www.bluehelix.co.uk)



## EDP Europe

To help designers and installers create data centre and enterprise networks that support 10GBASE-T growth, Hubbell Premise Wiring – distributed in the UK by EDP Europe – has introduced its HCL Series Low Diameter Patch Cords.

The problems associated with traditional Category 6A and 6 cables – such as thickness, stiffness, airflow reduction and larger cable organiser requirements – are minimised with HCL Series Low Diameter Patch Cords.

The smaller size makes port access easier and helps adds, moves and changes occur more quickly. Cable routing is also easier, and size requirements for cable trays and organisers are reduced.

With a tighter allowable bend radius than traditional cords – 63 per cent better for Category 6A, and 40 per cent better for

Category 6 – HCL Series Low Diameter Patch Cords can be routed easily into tighter spaces and be managed more easily.

They help improve airflow, as well as lowering operating costs and making sure active equipment doesn't overheat.

For more information call 01376 510337, **CLICK HERE** to send an email or to visit the website **CLICK HERE**.  
[www.edpeurope.com](http://www.edpeurope.com)



## MISSED AN ISSUE?

CLICK ON THE COVER TO READ MORE



FOR A FREE SUBSCRIPTION TO **Inside\_Networks** **CLICK HERE**

## Leviton

The Leviton Atlas-X1 Category 8 system of connectors, patch cords, patch panels, and cable is now available in Europe and the Middle East.

The shielded system offers IT managers a versatile and cost effective option for 25Gb/s and 40Gb/s in the data centre access layer, using the globally adopted RJ-45 interface. The system is fully backwards compatible to Category 7A, 7, 6A, 6 and 5e cabling products and provides seamless auto-negotiation



between active equipment.

All Category 8 system components are manufactured by Leviton in its production facilities in the United States and the United

Kingdom, and have been third party tested to comply with the ISO/IEC 11801 Class I channel standard and support power over Ethernet (PoE) applications up to 100W.

To learn more about the Atlas-X1 Category 8 system [CLICK HERE.](http://www.leviton.com)  
[www.leviton.com](http://www.leviton.com)

## Panduit

Panduit's 28-gauge cabling system offers up to 50 per cent space saving and reduced costs over 24-AWG cabling systems in data centres. Developments in cabling technology and the changing needs of installations are driving the requirement for 28-AWG copper wires in these environments. 28-AWG cabling offers significantly smaller diameter wire than 24-AWG copper conductors generally used in network and cabinet racks.

A Category 5e cord with 28-AWG wires is 3.78mm outer diameter (OD), which is 48 per cent the size of a typical Category 5e cord with 24-AWG wires. A Category 6 cord with 28-AWG wires is 3.8mm OD, which is 41 per cent the size of the

typical 24-AWG Category 6 cord, while a Category 6A cord with 28-AWG wires is 4.7mm OD, 45 per cent the size of a typical 24-AWG 6A cord.

With today's primarily used 24-AWG cabling systems there are situations where a rack or cabinet can accommodate more equipment, however, there is limited space to effectively add the patch cabling that would be required

affecting moves, adds and changes (MACs). In this type of situation, 28-AWG patch cabling is an effective solution to cabling system space limitations.

To find out more call +44 (0)208 6017200 or [CLICK HERE.](http://www.panduit.com)  
[www.panduit.com](http://www.panduit.com)



## HellermannTyton

HellermannTyton manufactures a full end-to-end copper network system in Category 6A, 6 and 5e.

From patch panels to patch leads and cable through to data outlets, HellermannTyton has an extensive product range, giving the installer and end user a number of options when it comes to choosing the best solution for a project.

The Category 6A solution is available in UTP and FTP. High performance jacks are at the centre of the systems which, when combined with HellermannTyton Category 6A cables and patch cords, deliver superior Category 6A performance.



HellermannTyton offers a range of products in its Category 6 and 5e systems. With Global, AlphaSnap,

Gigaband and Ecoband patch panels, customers can benefit from a wide range of panel options. The Category 6 cable is available as shielded or unshielded and with PVC or LSOH outer sheaths.

With a wide selection of patch panels, data outlets, cabling and patching options, there is a HellermannTyton solution for any project.

**CLICK HERE** to find out more, call 01604 707420 or to send an email **CLICK HERE.**  
[www.htdata.co.uk](http://www.htdata.co.uk)

## R&M

When it comes to structured cabling for local area networks (LAN), planners, installers, and building owners are increasingly demanding compact solutions.

R&M has developed the slimline 1HP DRM45 adaptor for RJ-45 network connections required to support Internet of Things, Industrial Ethernet, internet connections for machines, and controllers for smart buildings.

35mm top hat rail is often the installation platform of choice in these applications.



The new slimline 18mm rail adaptor for copper and fibre optic connectivity supports high-density LAN cabling on top hat rails. The rail adaptor

corresponds to 1 horizontal pitch (HP), the typical pitch pattern on standard 35mm top hat rails (DIN EN 50 022) and can be easily clicked into place. The adaptor supports LC duplex and SC simplex fibre optic cabling connections, as well as

shielded and unshielded versions of RJ-45 copper modules Cat. 6A EL, Cat. 6A ISO, and Cat. 6A coupler.

To find out more **CLICK HERE.**  
[www.rdm.com](http://www.rdm.com)

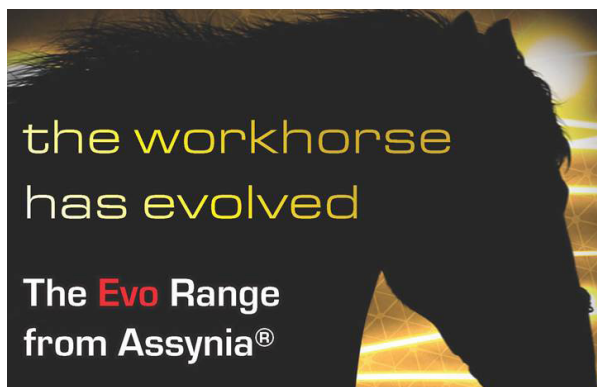
## CMS

Are you installing Construction Products Regulation (CPR) compliant cable?

CMS stocks a range of Eca-B2ca compliant cable, which is available

from our Assynia, Corning, CommScope and HellermannTyton partners. For advice on your product requirements or for CPR compliance advice, give our technical team a call on 01252 379379.

Designed for the professional installer and continuously developed over the last 15 years, the Assynia solution is a high



performance, CPR compliant structured cabling system that's backed by a comprehensive 25-year warranty.

Become an Assynia Accredited System Installer and benefit

from access to training facilities, technical support, free training (one day course covering CPR, networks, copper/fibre and best practice) and exclusive pricing. To join our Accredited System Installer Scheme.

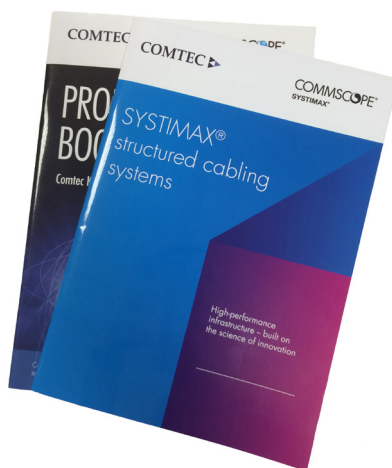
**CLICK HERE.**

To find out more **CLICK HERE.**  
[www.cmsplc.com](http://www.cmsplc.com)

## Comtec

Trading for 40 years, Comtec is the UK's largest independently owned distributor of CommScope's SYSTIMAX and NETCONNECT portfolios of copper cabling solutions.

We hold a significant stockholding of both SYSTIMAX and NETCONNECT, all available for free next day delivery. The range includes cables, patch panels, patch cords, POD boxes and much more – everything required for your



CommScope copper cabling installation.

Our team has many years' experience working with CommScope and is ideally suited to support you in your CommScope projects. Call us on 01480 415000 to arrange a meeting.

The SYSTIMAX and NETCONNECT range may also be viewed and ordered

online by **CLICKING HERE.**  
[www.comtecdirect.co.uk](http://www.comtecdirect.co.uk)



## Siemon

With ConvergeIT Siemon provides a unified intelligent building cabling solution that combines Siemon's proven quality with advanced copper and optical fibre cabling technology. This

creates a structured cabling system that converges critical data, voice, video and low voltage building systems onto a single unified physical infrastructure that also delivers power over Ethernet (PoE).

The latest addition to Siemon's ConvergeIT solution is the innovative Z-PLUG Category 6A field terminated plug that enables quick and reliable high-performance direct connections to IP-based and PoE-enabled devices in intelligent buildings.



Z-PLUG terminated links allow for custom length connections to wireless access points, security cameras, LED lights, distributed antenna systems and building automation devices, eliminating the need

for network boxes, outlets and patch cords to connect to the network.

Z-PLUG plugs can be terminated to shielded, unshielded, solid and stranded cables and support 10Gb/s system transmission performance for today's high speed applications and the latest PoE applications including advanced four pair Type 3 (60W), Type 4 (90W) and power over HDBaseT (POH).

To find out more **CLICK HERE.**  
[www.siemon.com/uk](http://www.siemon.com/uk)

# PASS IT ON

## SHARE THE KNOWLEDGE!



TO SHARE **Inside\_Networks** **CLICK HERE**

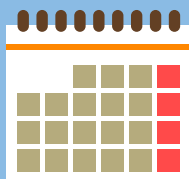
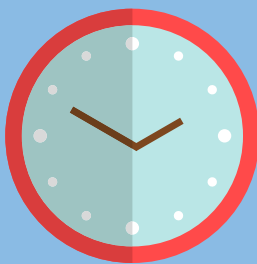
# Quickclicks

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

Yes, Data Center Flexibility and Standardization are Possible is a blog from **Schneider Electric**.  
[CLICK HERE](#) to read it.

**Fluke Networks** has updated its Fiber Testing Best Practices pocket guide. To obtain a free copy [CLICK HERE](#).

Design and Cost Considerations for Digital Buildings is a webinar from **Siemon**.  
To view it on demand [CLICK HERE](#).

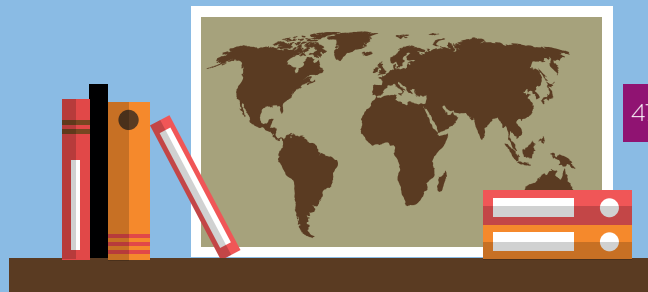


FOR A FREE  
SUBSCRIPTION TO  
**Inside\_Networks**  
[CLICK HERE](#)

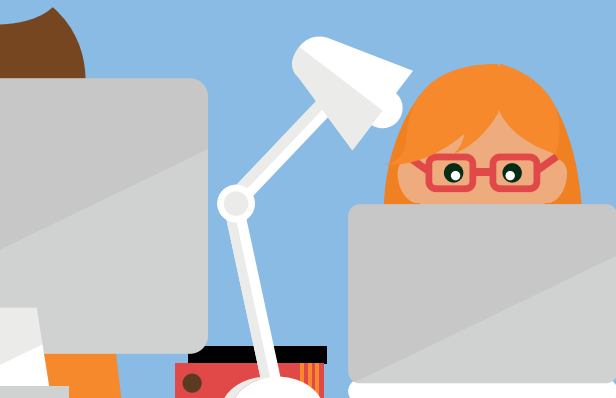
Pay Attention to These 5  
Rack PDU Details is a blog  
from **Geist**.  
[CLICK HERE](#) to read it.

5 Reasons Power over Ethernet is Right  
for Enterprise is a blog by Kirk Krahn of  
**Leviton**.  
[CLICK HERE](#) to read it.

**Chatsworth Products'**  
**(CPI)** has announced  
details of its new Drive  
Forward Webinar  
Series, which looks at  
industry trends and  
best practices.  
[CLICK HERE](#) to find  
out more.

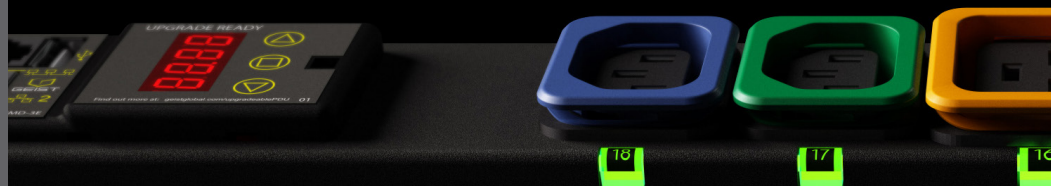


Lengthonomics and the  
Benefits of Reach is a blog from  
**Paige Datacom Solutions**.  
[CLICK HERE](#) to read it.



# Efficiency drive

**Mo Sheikh** of Geist, a division of Vertiv, explains how to cut costs and improve data centre efficiency by using switchable power distribution units (PDUs)



48

▶ Managing power has become a critical and variable factor in data centre operating costs. Energy efficiency in data centres is often measured using Power Usage Effectiveness (PUE). PUE is the ratio of total facility energy to IT equipment energy within a data centre. Essentially, it is a measure of how efficiently the power and cooling is being delivered to the IT equipment.

## NUMBER CRUNCHING

According to the Uptime Institute's 2014 Data Centre Survey, the global average PUE of respondents' largest data centres is around 1.7. This means for every 1.7W in at the utility meter, only 1W is delivered out to the IT load. Reducing the usage of non-IT facility equipment including cooling and lighting, while optimising the use of IT resources is key in improving PUE.

Modern data centres are purchasing more energy efficient hardware and making design changes to improve performance and get as close to a PUE of

1.0 as possible. An area that's often overlooked is the rack power distribution unit (PDU).

## RACK 'EM UP

Rack PDUs play a vital role in safely delivering power to servers, storage devices and network equipment. What is less understood is how much PDUs contribute to overall efficiency, when properly managed. There are a variety of available PDU types, which mainly consist of basic, metered, monitored and switched formats. Higher end PDUs typically have more capability and intelligence while also providing power metering – aggregate and outlet level – and environmental monitoring.

Monitored and switched PDUs have networking capability and are often referred to as intelligent PDUs. Intelligent rack PDUs provide access to historic and real time power usage data,

'Having PDUs with reboot, as well as provides data centre effectively and safely online.'





ch the ability for remote  
power-on sequencing,  
centres with a way to  
safely get equipment back

allowing  
managers to better  
balance  
and  
reallocate  
energy  
resources.  
These

people, having to dispatch administrators  
to an unresponsive server is time  
consuming and costly.

When a server becomes unresponsive, often the only viable resolution is a hard reboot requiring the administrator to physically unplug the device and plug it back in. These manual reboots often translate to longer downtime, which impacts revenues, reputation and overall productivity. This especially rings true for remote facilities, where there is far more expense involved in getting personnel to the facility. Having the ability to perform a remote hard reboot through the PDU interface offers an instant fix. Additionally, switched PDUs provide secure control of individual outlets enabling authorised users to address such issues instantaneously.

The costly effects of one or two unresponsive devices in a large scale outage, like a brownout or blackout, can be debilitating to data centre operations. Recovering from a downtime incident requires more than just restarting

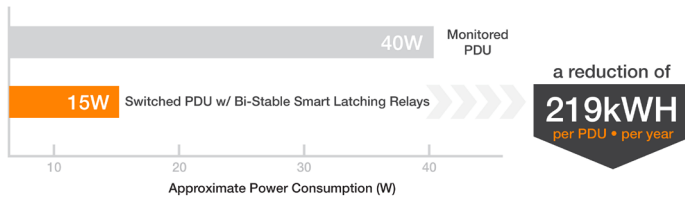
PDUs also can generate alerts when circuits are at risk of overloading or have been tripped. Intelligent PDUs help improve PUE by integrating environmental sensors to determine airflow patterns, identify hot spots and provide insights for system design improvements.

Some switched PDUs offer additional features such as remote reboot of unresponsive servers, the remote shutdown of idle equipment and reduced energy use.

## MORE WITH LESS

Given that most data centres are struggling to get more done with fewer

### 36 Socket PDU Power Consumption Comparison



and optimise facility power and cooling to operational IT infrastructure.

According to a Wall Street Journal article in 2015, there were up to 10 million zombie

equipment. Even if remote and/or automated rebooting is possible, equipment must be powered-on sequentially to avoid an in-rush current event or an event in which the significant amount of initial energy required to start equipment overloads the equipment.

In cases like these, having PDUs with the ability for remote reboot, as well as power-on sequencing, provides data centres with a way to effectively and safely get equipment back online. Power-on sequencing utilises power state sensing to ensure relays are de-latched if power fails. This allows each outlet on the PDU to be rebooted sequentially when power is reapplied to avoid an in-rush current event.

## ZOMBIE APOCALYPSE

Another cost management benefit of individual outlet monitoring and control is having the ability to identify idle servers that are silently sucking up data centre power but providing little to no IT processing power – commonly referred to as zombie servers.

Individual outlet monitoring and control allows data centre personnel to identify when servers are needlessly using power. Once these servers are identified, applications can be consolidated to fewer servers, power to these servers can be cut to decrease costs and, consequently, updates may be made to concentrate

servers in operation, using the power equivalent of eight large power plants. This doesn't even include the cost savings in hardware maintenance or network ports usage consumed by the unused servers. Implementing PDUs that provide the right kind of visibility and control capability can have a significant impact on savings and operations. Administrators can further utilise switchable PDUs to gain control of equipment by disabling and locking unused outlets until proper authorisation and permission is granted to power new equipment.

Regulating unused outlets decreases the opportunity for zombie servers to occur and prevents inadvertently overburdening the power system. All of which contribute to improved PUE rating and reduced costs.

## SWITCHED ON

Using less power improves PUE. Switched PDUs, which are equipped with bi-stable smart latching relays that magnetically hold contacts closed or open without the need for continuously energising the relay coil, which can save significant amounts of energy.

Consider a 36 outlet monitored PDU that typically uses about 40W in an idle state. Compare that with a 36 outlet intelligent switched PDU with bi-stable smart latching relays that uses

approximately 15W when idle. Use of the switched PDU with bi-stable smart latching relays could provide a yearly reduction in power use of up to 219kWh per PDU. In a data centre with 500 PDUs, that equates to up to 109,500kWh in reduced power usage. Incorporating smart latching relays offers significant energy savings compared to traditional switching PDUs that require continuous power to hold the contacts closed or open.

### ON THE LOOK OUT

As data centre designers and operators look for ways to reduce energy consumption, making the right choice with regards to cabinet power distribution units will make a significant impact. PDUs equipped with outlet level monitoring, control and energy efficient hardware provide the insights and operations to optimise uptime, significantly improving PUE and reducing costs. ■



#### MO SHEIKH

Mo Sheikh is a product manager at Geist, a division of Vertiv. He focuses on embedded technologies including PDUs and environmental monitoring solutions. With nearly a decade of experience in the data centre industry, he is passionate about building evolutionary solutions that will continue to refine and enhance data centre operations as technology continues to advance.

## Uninterruptible Power Supplies Ltd

Recognised for being at the forefront of power protection innovation and technology, PowerWAVE UPS products from Uninterruptible Power Supplies Ltd are amongst the class leaders in terms of system reliability, efficiency, availability, scalability and flexibility. Products range from the single phase, 1-10kVA PowerWAVE1000 right up to the three phase 100-500kVA modular PowerWAVE 9500DPA.

Uninterruptible Power Supplies Ltd products are ideal for a range



of applications and industries including IT, telecommunications, financial services, education, healthcare and more – PowerWAVE UPS generate less CO<sub>2</sub>, save valuable floor space and significantly reduce total cost of ownership.

Uninterruptible Power Supplies Ltd was the first company to introduce modular UPS and transformerless technology to the market and continues to innovate with new products, such as the PowerWAVE 9500DPA UPS

and PowerNSURE battery monitoring technology.

To find out more [CLICK HERE](http://www.upspower.co.uk).  
[www.upspower.co.uk](http://www.upspower.co.uk)

## Excel Networking Solutions

Excel Networking Solutions offers a range of power distribution units (PDUs), designed to simplify energy management and monitoring of cabinets or data centres.

Available to suit an assortment of environment requirements, Excel has intelligent PDUs, standard PDUs, desktop PDUs and modular PDUs, allowing for complete flexibility when designing an end-to-end infrastructure solution. PDUs are an important and often overlooked part of an infrastructure design and installation. At their simplest they deliver the power required for the equipment



within the rack, while more advanced units provide management information on power consumption and local environmental conditions such as temperature and humidity.

It is important to consider the PDU requirement at the rack installation stage rather than as an afterthought at the equipment installation stage. Making sufficient provision for the power will ensure the longevity and best use of the rack.

To see the full range [CLICK HERE](http://www.excel-networking.com) and for further information about Excel [CLICK HERE](http://www.excel-networking.com).  
[www.excel-networking.com](http://www.excel-networking.com)

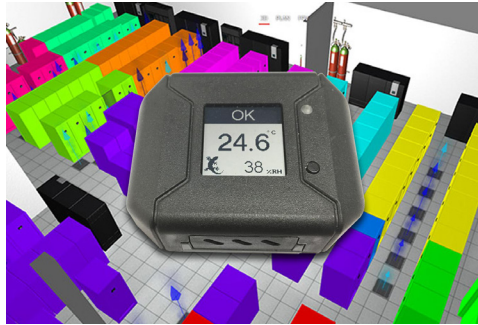


## EkkoSense

EkkoSense combines key hardware, software and optimisation services to deliver a step change improvement in data centre thermal risk management. The results are compelling, with

EkkoSense effectively eliminating the thermal risks associated with under-cooling as well as the unnecessary costs and energy usage that's linked to over-cooling.

With EkkoSense you not only eliminate thermal risk completely, but also get to identify and achieve ongoing data centre cooling energy cost savings of up to 30 per cent.



EkkoSense consistently delivers these kinds of results by monitoring and reporting temperature and cooling loads in real time on a rack-by-rack basis. Unfortunately, less than five per cent of data centres

actually collect this level of granular data. However, EkkoSense goes further by combining its data with smart monitoring and visualisation software that lets you start to really track cooling loads in realtime.

To find out more call 0115 823 2664, [CLICK HERE](#) to send an email or to visit the EkkoSense website [CLICK HERE](#).  
[www.ekkosenesense.co.uk](http://www.ekkosenesense.co.uk)

## GET YOURSELF SEEN

BY THE TIME YOU READ THIS YOUR COMPETITORS' ADVERTISEMENTS WILL HAVE BEEN SEEN BY OVER 19,000 READERS OF INSIDE\_NETWORKS.

IF YOU WOULD LIKE TO PROMOTE YOUR PRODUCTS AND SERVICES AND MAXIMISE THE POTENTIAL OF YOUR ONLINE ACTIVITIES, [CLICK HERE](#).



FOR A FREE SUBSCRIPTION TO **Inside\_Networks** [CLICK HERE](#)

## Geist

Geist Upgradeable Metered PDUs improve system reliability, energy efficiency and guard against crippling downtime caused by power overloads.

Visibility into real time power consumption metrics through local digital displays helps managers keep efficiency and safety top of mind when deploying or moving critical server equipment. Equipped with a digital current meter, the Geist Metered GU PDU provides reliable rack mount –zero U, 1U or 2U – locking receptacles, and single or three phase power distribution from a protected UPS,



generator or main input power source.

Flexible and upgradeable, users can hot-swap an interchangeable monitoring device (IMD) to transform their units from a metered to monitored PDU on the fly, as requirements become

more sophisticated.

The metered PDUs cater to a wide range of power input and output requirements to distribute 100-240V to multiple outlets. They are available in various horizontal and vertical configurations to meet different accessibility needs.

For more information [CLICK HERE](http://www.geistglobal.com).  
[www.geistglobal.com](http://www.geistglobal.com)

## Mayflex

Available from Mayflex, the ECS2100 Series from Edgecore Networks is a range of web-smart switches designed for the small to medium sized enterprise (SME) market.

The switches can be deployed in different target network topologies, from small to large. Besides powerful software features, the switches provide a complete solution from 1Gb/s to 10Gb/s, including both non-PoE and PoE options. Using green saving technologies, within the Energy Efficient Ethernet standard, the switch automatically decreases power usage when network traffic is low.

The ECS2100-28P offers the necessary speed and power required for the new Ethernet systems. Whether the network



is needed for wireless access points, IP cameras, HVAC, traditional data or access control, the ECS2100-28P has the port speed and PoE budget to cope.

All Edgecore Networks products are supported under a Limited Lifetime Advance Replacement Product Warranty. Products will be supported up to two years from being made end of life, while software warranty is 90 days.

Mayflex distributes the Edgecore Networks range in the UK and leads the way in converged IP solutions. For further details on the Edgecore Networks range of switches, please speak to our team of experts on 080075 7565 or [CLICK HERE](http://www.mayflex.com) to send an email.

[www.mayflex.com](http://www.mayflex.com)

## Rittal

The Rittal Edge Data Center comprises two Rittal TS IT racks plus corresponding modules for power distribution, UPS, climate control, fire suppression, monitoring and secure access. These units are available in various output classes, and can be easily combined for rapid deployment. Moreover, to safeguard critical components, the Rittal Edge Data Center can be implemented in a self-contained high availability room.

Customers that would prefer not to operate the edge data centre themselves can opt for Rittal's data-centre-as-a-service (DCaaS) offering. Hand-in-hand with its IT-as-a-service (ITaaS) platform provider, iNNOVO Cloud, Rittal also



offers private cloud data centres in shipping containers, plus ITaaS. The containers are fully equipped with all key active components, such as servers, network connectivity and storage for immediate use.

The Rittal Edge Data Center can be extended two racks at a time. Moreover, the modular approach provides customers with diverse options, allowing it to accommodate a variety of scenarios – for example, installation in an IT security room, or in a container, to be located wherever it is required.

To find out more [CLICK HERE](http://www.rittal.co.uk).  
[www.rittal.co.uk](http://www.rittal.co.uk)

55

## Inside Networks

2019

CHARITY GOLF DAY

*An opportunity to compete and entertain clients and colleagues at the superb Marriott Hanbury Manor Hotel & Country Club.*

[www.marriottgolf.co.uk/club/hanbury-manor](http://www.marriottgolf.co.uk/club/hanbury-manor)

Indoor Simulator  
Competition



### Playing the Hanbury Manor PGA Championship Course:

This prestigious golf course was the first to be designed by Jack Nicklaus II and still incorporates features from an earlier 9-hole course designed by the great Harry Vardon. The course is now widely recognised as one of the best in England.

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 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 £55,000 through our charity golf events!

Supporting:

**WE ARE  
MACMILLAN.  
CANCER SUPPORT**

Organised by:




Promoted & Supported by:



To book a team or for further information email [info@slice golf.co.uk](mailto:info@slice golf.co.uk) or telephone 077 69 69 69 76

# Made to measure

**Peter Thickett** of Siemon looks at current data centre energy usage trends and why using the right power distribution devices can help lower Power Usage Effectiveness (PUE) within the data centre

 Energy consumption is still a significant operational expense in a data centre, accounting for 20 to 30 per cent of the total cost of ownership. It plays a critical role in data centre management, and will continue to do.

## PAPER WORK

A paper titled Trends in Data Centre Energy Consumption Under the European Code of Conduct for Data Centre Energy Efficiency, which was recently published by the European Commission, shows that energy consumption in data centres across Europe is estimated to reach 104TWh by 2020. Whilst power consumption has been addressed through new technologies including Energy Efficient Ethernet and virtualisation, and has hence reduced in recent years, operators continue to be driven by the requirement for energy efficiency and intelligent power utilisation.

For most data centre operators, Power Usage Effectiveness (PUE) is the tool of choice to measure the energy efficiency of their facility, meaning how effectively and efficiently a data centre can support and run its equipment. PUE is the ratio of the total energy delivered to a data centre to the actual energy used by the equipment.

$$\text{PUE} = \frac{\text{Total Facility Power (kW)}}{\text{IT Equipment Power (kW)}}$$

The lower the PUE score, the more efficient a facility operates, and the perfect score would be 1. However, to

achieve this, a data centre would need to provide energy to the IT equipment with zero losses, and it would not need to spend energy on cooling the devices – so obviously a PUE of 1 is unrealistic. However, some companies have come very close.

## CHILL OUT

Since a huge portion of energy consumption is associated with cooling, there have been major strides in recent years with the adoption of more efficient cooling methods. Systems vary from passive cooling such as hot aisle/cold aisle containment through to more involved, active cooling practices to control device temperatures in the most efficient manner possible. Also, data centre owners have opted to select locations in cooler climates, where the potential to adopt free cooling methods is more achievable.

In some cases, owner/operators will claim their lowest PUE in the year when outside temperatures are the lowest and climate control energy spend is the lowest. This is where the PUE method has some shortcomings, since it does not specify if it is to be captured over a long period of time or just as a brief snapshot, which could be a poor measurement of efficiency.

With data centres becoming increasingly efficient through the adoption of more effective cooling strategies, the emphasis has now shifted to ways in which to analyse and monitor PUE to better understand



inefficiencies. Power distribution units (PDUs) can help determine where these inefficiencies lie.

## SELECTION PROCEDURE

Typically mounted in a 19-inch rack, a PDU forms the link between the power and IT infrastructures. Basic PDU versions simply ensure reliable power distribution to IT equipment, whilst more intelligent options accurately and routinely measure power consumption of the IT devices they are connected to.

Whilst PDUs are not able to prevent inefficiencies and losses in the power delivery system, such as those that

inherently occur when AC power is distributed across a data centre and when bringing mains voltage from outside into the data centre and stepping it down/up to the required voltage, they can assist the data centre operator in achieving their desired energy management goals. The importance, however, lies with selecting PDUs correctly.

As a general rule, data centre operators must ensure that a PDU is compatible with the power being delivered to a rack, so the voltage and current rating for the PDU matches that of the circuit that the PDU will be connecting to. The circuit feeding the rack needs to be defined according



‘Whilst power consumption has been addressed through new technologies including Energy Efficient Ethernet and virtualisation, and has hence reduced in recent years, operators continue to be driven by the requirement for energy efficiency and intelligent power utilisation.’

to the devices that will be mounted into the rack. Any future growth plans should also be considered to ensure that the rack and the power being delivered to it could support expansion later.

### SMART THINKING

With a view to assisting in the energy management of a data centre, it is important to select the right type of PDU and the level of intelligence it provides. Rack mounted PDUs can monitor current and power usage on various levels. The entry level method, a PDU with on-board metering, can display the total current being used by all the connected devices.

Intelligent PDUs can connect to the network and this data can be accessed remotely or consolidated by a data centre infrastructure management (DCIM) package. Higher end variants report not just the total current and energy being used by all the devices connected to the

PDU but this data can be reported at the outlet level for each connected device. Some versions also offer outlet level switching that allows for individual outlets to be remotely controlled and switched on or off as necessary.

### UNDER ANALYSIS

Having access to this much more detailed level of information and control means that data centre operators can analyse energy usage at an increasingly granular level, right down to individual equipment, and can take action accordingly.

Monitoring not just the entire PDU energy usage

but that of the discrete connected devices allows the owner to identify patterns as they emerge over time. This will mean that if devices are acting outside of their normal parameters they can be identified



quickly. For example, if a server is running hotter than it should – and this could be for many reasons including even physical issues like airflow blockages – the device fans must spin faster and hence use more energy to keep the temperatures under control. This not only can identify future problems and downtime, but it can also ensure that the energy consumption at the device level is known and monitored ensuring they operate within the intended ranges for energy use.

## FLICK THE SWITCH

It is often the case that devices aren't running critical services 24/7. In those cases, rather than having the unit idle or on standby, if a PDU with outlet level switching is being utilised, power to the device can be switched off entirely and restored when needed. This can be done automatically by a predefined schedule and it can even be done remotely which is a benefit for 'lights out' data centre operations where no-one is on site.

In some organisations, understanding peak energy cost periods and peak processing periods is important, as this can help shift more intensive processes to hours with lower utility tariffs, for example, to hours outside of 08:00 to 17:00, when demand is usually the greatest and utility companies using smart grid technology might have raised rates across the grid.

A bank, for example, might determine that the highest processing periods are when people are finishing work, from 16:00 to 18:00. When other applications are shifted to run after 18:00 this can enable power savings. Here, a PDU with outlet level monitoring can ensure that power is being drawn at its intended rate and at the time that has been set for the server/device.

## HELPING HAND

PUE remains the measure of choice to determine energy efficiency in the data centre and PDUs are a great tool to help analyse how effectively and efficiently a data centre can support and run its equipment. In order to increase energy efficiency, power consumption must first be measured, since you can't optimise if you haven't measured. Adopting the use of intelligent PDUs with outlet monitoring as part of the power delivery system to devices helps data centre operators collect and analyse energy usage at a very detailed level. Any 'abnormalities' in power consumption can be identified and rectified and overall PUE ratings will improve. ■



### PETER THICKETT

Peter Thickett is product manager for data centre systems at Siemon, where he is responsible for the PDU, pre-configured cabinet and containment product lines. He holds a degree in industrial product design and a master's degree in mechanical engineering. Prior to this role, he worked as a development engineer for Siemon.

## Schneider Electric ensures Angel Trains' data centre stays on track

Angel Trains provides rolling stock to several of the UK's largest train operating companies. Its data centre comprises a rack-based containment system, with critical power protection provided by Schneider Electric's Symmetra PX UPS units.

For additional resilience, there is a dual power feed running direct from the mains and an emergency back-up power generation unit on-site.

With key challenges that included cost

effectiveness, reliability and footprint, Angel Trains chose to adopt Schneider

Electric's ISX Pod architecture with inrow cooling for its data centre.

As part of a recent upgrade to the standard maintenance agreement, Angel Trains has also recently connected the data centre infrastructure components to Schneider Electric's

EcoStruxure IT monitoring solution, which was previously known as StruxureOn. This delivers detailed 24/7 monitoring and critical insights straight to the users' mobile phone.



## Equinix to expand London data centre

Equinix will expand its LD4 International Business Exchange (IBX) data centre at its London Slough campus. The new phase supports the continued growth of the world's largest multi-asset class electronic trading ecosystem, which consists of a robust collection of interconnected execution venues, trading platforms, market data vendors, service providers, buy-side firms, and sell-side firms. The new £29m expansion is scheduled to open Q4 2018.

The new expansion of the LD4 data centre will enable customers to interconnect securely with 1,000+ businesses in London including leading capital markets participants, insurers and electronic payments firms, as well as 200+ network service providers and 275+ cloud and IT service providers. Today, LD4 has 3,777

cabinets in approximately 10,000m<sup>2</sup> of colocation area – the expansion will add an additional 1,075 cabinets in approximately 3,300m<sup>2</sup> of colocation area.

Leading financial services companies such as Nasdaq leverage Equinix's global interconnection platform – Platform Equinix – to securely transact with ecosystem participants. As the creator of the world's first electronic stock market, Nasdaq has deployed with Equinix in LD4 in London, as well as New York City for close proximity to customers and partners who demand high performance, low latency connectivity. This private connectivity allows for sharing large amounts of data with multiple stakeholders through private business exchanges, securely bypassing the public internet completely.



# EkkoSense saves Daisy £115,000 in first months of data centre cooling managed service

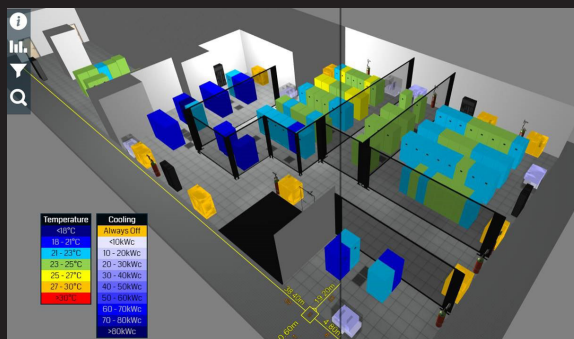
Daisy Group has saved over £115,000 of data centre cooling energy costs during the first months of its five-year data centre thermal optimisation managed service with EkkoSense. The service is already reducing data centre thermal risk, increasing cooling capacity and cutting cooling equipment energy costs across five Daisy UK data centres.

The EkkoSense thermal optimisation managed service combines Internet of Things (IoT) enabled sensors, software as a service (SaaS) 3D thermal visualisation and

monitoring software, and data centre cooling optimisation skills to deliver an improved data centre thermal performance thanks to specialist airflow and cooling optimisation capabilities.

EkkoSense's Thermal Optimisation Managed Service features the company's EkkoAir IoT sensor technology, the latest EkkoSoft Critical 3.2

SaaS enabled software for 3D thermal visualisation and monitoring, as well as advanced 3D data centre room building capabilities.



## PROJECTS & CONTRACTS IN BRIEF

KCOM has deployed fibre to the premises capability to 150,000 properties in Hull and East Yorkshire, representing 75 per cent of its network in the region.

Iskratel's Innbox G108 home gateway is being used in a next generation PON trial by one of the leading EMEA Tier-1 operators involved in the Central Office Re-architected as a Datacenter (CORD) project.

The Grand Hotel Huis ter Duin in Noordwijk, the Netherlands, has selected NEC's Smart Hospitality Solutions to migrate to an all IP environment that exploits the benefits of present day business mobility and unified communications. Telematch, NEC's certified business partner, provided the advanced solutions as part of the hotel's renewed ICT infrastructure.

Keysource has won a five year contract with Indectron to provide facilities management and technical services at its Gloucester data centre.

Colt Data Centre Services (DCS) has strengthened its partnership with Eurofiber. Eurofiber's future proof digital infrastructure will enable Colt DCS' customers added resilience, flexibility and scale for their European operations.

# All you need to know



CLICK ON THE COVER TO VIEW THE 2018 MEDIA KIT

# Taking the heat off



**Jonathan Dunbar** of Leviton explains how to minimise temperature rise in power over Ethernet (PoE) installations

▶ When twisted-pair cabling is used for PoE, the majority of the power entering the cable from the power source equipment (PSE) is successfully delivered to the powered device (PD). However, a percentage of the power supplied is dissipated in the cabling as a natural result of DC resistance – the Joule-Lenz Theory.



## HOT STUFF

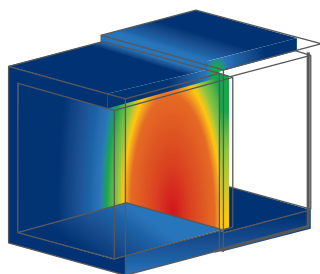
Power dissipation as a result of DC resistance means an increase to the temperature of the conductors and the entire cable, particularly cables in bundles. This can cause the cable's temperature to increase above the temperature of its surroundings. As the operating temperature of a communications cable

rises, its signal attenuation will also rise and could affect network performance and cable stability as a result. It is important

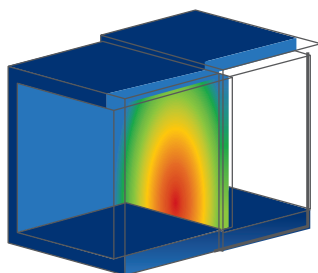
‘The maximum temperature to which a cable will increase depends on a number of factors including the amount of power being applied to the cable, the cable’s DC resistance, the cable’s construction, ambient temperature, and the amount of heat allowed to radiate out of the cable.’

to keep cable temperatures at reasonable levels and below the maximum operating temperature of the cable, as indicated by the manufacturer. This will:

- Prevent transmission impairment due to



Plastic



Metal

- cable structural compromise
- Reduce long-term cable degradation
- Minimise the negative effect of heating on transmission performance (attenuation)
- Reduce the amount of heat added to the surrounding environment

## COMPONENT PARTS

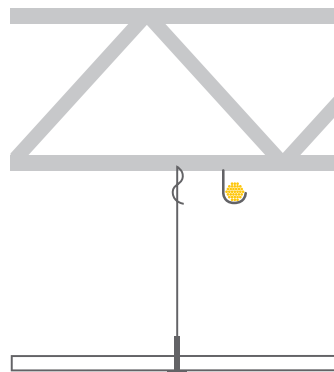
The maximum temperature to which a cable will increase depends on a number of factors including the amount of power being applied to the cable, the cable’s DC resistance, the cable’s construction,

ambient temperature, and the amount of heat allowed to radiate out of the cable.

If cables are bundled or closely grouped, those near the centre of the bundle have difficulty dissipating their heat out into the environment. Therefore, the cables in the middle heat up more than those toward the outer surface of the bundle. The larger the bundle size, the more the cables will heat up.

Industry standard cables carrying PoE at low power levels like 15W and 30W are unlikely to overheat, unless extreme conditions exist such as huge bundle sizes or extreme ambient temperatures. It is only

when high levels of PoE are deployed like 60W and 100W that heating can become a potential issue. Industry best practice is to limit the temperature rise of cables to no more than 15°C above ambient temperature and to keep the maximum



operating temperature of all cables to below the maximum operating temperature of a cable per manufacturer's specifications.

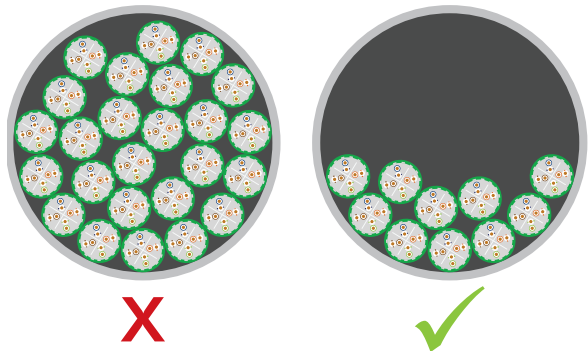
## TOP TIPS

The following list of general installation practices will help minimise heating in cables carrying any level of PoE and make sure the temperature rise of cables as a result of high power PoE applications do not exceed industry best practice:

- Consider using a shielded cabling system. The shielding acts as a heat sink and radiates heat better than traditional U/UTP cable, significantly minimising the cables' temperature rise.
- Use Category 6A in all new cabling installations for Class 3 or 4 (60W or 100W) PoE, unless mandated otherwise. The construction of Category 6A cables with their larger gauge wires, and construction methods utilised to meet alien crosstalk characteristics

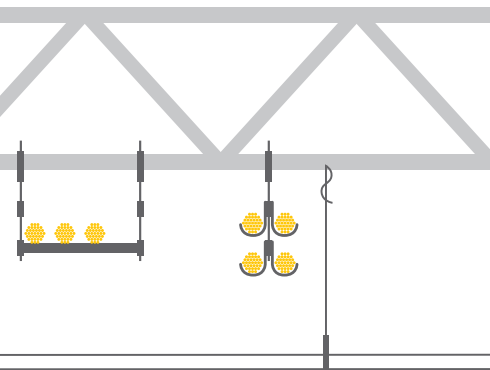
also make Category 6A an excellent choice for managing and dissipating heat build-up. Pay attention to upcoming industry standards, which are expected to recommend Category 6A be used for new installations where higher power PoE applications are anticipated for these reasons.

- Use horizontal cables and patch cords that have larger copper conductors. These larger conductors will heat up less and perform better than smaller conductors. Category 5e cables utilise 24-gauge (.51mm) conductors, whilst



Category 6 and Category 6A cables are mostly constructed with 23-gauge (.57mm) conductors.

- Use connectors with an all metal body construction, instead of plastic. Leviton PoE verification testing found that metal connector bodies create a 53 per cent improvement in heat dissipation.
- Consider using cables from a manufacturer that publishes higher long-term operating temperatures such as 75°C instead of 60°C, particularly for environments where higher than ambient





temperatures are possible. Regardless of the published cable operating temperature always try to keep the maximum ambient temperature at reasonable levels. A good target is 45°C, which allows for a 15°C temperature rise due to PoE, while still keeping under the 60°C long-term operating temperature.

- Plan for cable management and trays to use minimal fill rate to allow for expansion – less than 50 per cent is ideal.
- Use wire cable trays or similar cable management that allows for largely unrestricted airflow around the cables or cable bundle.
- Loosely group cables when possible, rather than bundling. If bundling is required, loosely bundle cables in the smallest bundle size that suits the needs of the installation.
- Evenly distribute cables or cable bundles within the available area.
- Minimise the number of cable ties used to secure the cables. Apply with minimal tension. Consider hook and loop fasteners, which are less likely to crush or damage cables.
- Avoid surpassing the max fill ratios of the containment particularly when passing through penetrations (wall and/or floor). Where this can't be avoided then loosely arrange the cables on either side to help dissipate any possible heat build-up.
- Use very minimal bundles sizes for long

cable runs carrying high wattage PoE (70m and longer). This minimises the temperature rise and resulting increases in attenuation, enabling you to avoid having to reduce the allowable channel lengths cables as dictated by ISO/IEC 11801.

- Refer to upcoming industry standards for remote powering of DTE devices such as the following for guidance – ISO/IEC TR 29125:2016 | CENELEC TR 50174-99-1.

## RULES AND REGULATIONS

These tips are not intended to supersede or take place of any governing standards. Cabling intended to carry PoE should be installed in accordance with local regulations. ISO/IEC TR 29125 can also provide additional information for facilitating installation. ■



### JONATHAN DUNBAR

Jonathan Dunbar is senior product manager at Leviton Network Solutions Europe and manages the company's copper cabling portfolio.

08:25



WE HOPE YOU HAVE ENJOYED

## Inside\_Networks

COMING UP IN AUGUST 18'S ISSUE:

SPECIAL FEATURES:

- > IP SECURITY AND ACCESS CONTROL
- > AIM

TO FIND OUT MORE ABOUT PROMOTION  
WITHIN THESE FEATURES [CLICK HERE](#)

- > ALL THE LATEST NEWS, VIEWS, COMMENT AND ANALYSIS
- > WHY EDGE COMPUTING IS REDEFINING DATA CENTRE TECHNOLOGY
- > ASSESSING THE IMPACT OF THE CPR
- > INSIDE\_NETWORKS 2018 CHARITY GOLF DAY REVIEW
- > WHY DATA PROTECTION AND INFORMATION SECURITY HAS NEVER BEEN MORE IMPORTANT
- > SHOULD AIM BE CONSIDERED A LUXURY OR A NECESSITY?
- > MOVES, ADDS AND CHANGES IN THE CHANNEL
- > NETWORK INFRASTRUCTURE CASE STUDIES FROM AROUND THE WORLD
- > THE LATEST PRODUCT, SYSTEM AND SERVICE DEVELOPMENTS

FOR A FREE SUBSCRIPTION TO [Inside\\_Networks](#) [CLICK HERE](#)