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Number crunching
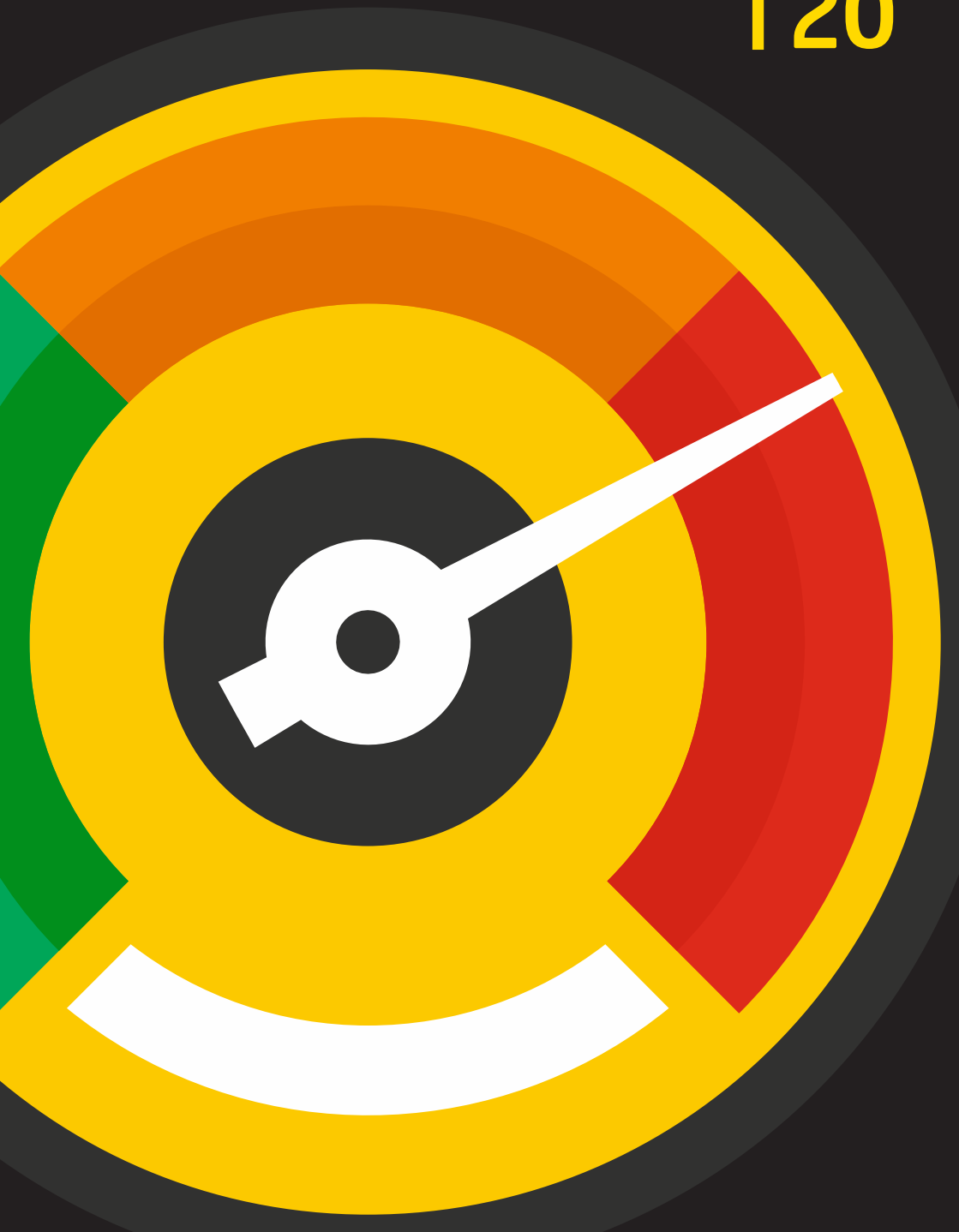
IS THE PUE METRIC STILL RELEVANT?

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And we're off!

CHALK HILL MEDIA

6

2020 has got off to a flying start and it already feels like it could be a pivotal year for the colocation data centre sector. Those charged with managing and operating these facilities have a lot to think about at the moment, not least of all with the rollout of 5G and the growth of the internet of things (IoT), and it will be interesting to see how they react.

The need for due diligence when selecting a colocation provider has never been more important and it's not a decision that should be taken lightly. We've asked Simon Bearne of Next Generation Data (NGD) to shed some light on the key considerations and you can read his advice by **CLICKING HERE.** Choosing wisely is vital, not least of all because digital transformation has the power to literally save lives. Tim Carter of Equinix looks at the role data centres will play in next generation healthcare and you can read his article by **CLICKING HERE.**

It's no secret that data centres use a lot of electricity and have large carbon footprints. With the widespread emphasis on energy efficiency showing no sign of lessening, we've asked a panel of experts to examine whether The Green Grid's Power Usage Effectiveness (PUE) metric is losing its relevance when it comes to reporting energy use within data centres. You can read this month's Question Time by **CLICKING HERE.**

Also in this issue, we focus on copper cabling, with two excellent articles on the subject. In the first, Stuart McKay of Panduit looks at how the built environment is going digital with power over Ethernet (PoE), while in the second piece, Matthias Gerber of R&M looks at whether there is a place for RJ-45 Cat.8 in the LAN. **CLICK HERE** to read Stuart's article and **CLICK HERE** for Matthias's.

With so much more besides the above, I hope you enjoy this issue of Inside_ Networks. Don't forget that if you'd like to comment on any of these subjects, or anything else to do with enterprise and data centre network infrastructures, I'd be delighted to hear from you.

Rob Shepherd
Editor

Inside_Networks
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One in four businesses does not have a disaster recovery plan in place

A survey of 1,125 IT workers in full or part-time employment, carried out by Probrand, has revealed that 24 per cent of UK small to medium sized enterprises (SMEs) do not have an IT disaster recovery plan in place, yet 80 per cent of businesses who suffered a major incident failed within 18 months.

Of those workers who are employed at a business which does have a disaster recovery plan in place, as many as 54 per cent revealed that it is not regularly tested. In fact, 33 per cent of IT workers claim that their company's disaster recovery plan has never been tested during their employment.

Matt Royle

Matt Royle, marketing director at Probrand, commented, 'We have found that nearly a quarter (24 per cent) of SMEs don't have a disaster recovery plan in place. In real terms, this figure represents just under 1.4 million UK businesses who, in a worst case scenario, are at serious risk of failing due to insufficient disaster recovery plans that include simple data back-up and recovery.'

Almost half of women in tech feel gender pay gap is still an issue

Ivanti's Women in Tech Survey has found the majority of women who work in the technology industry are still experiencing inequality when it comes to salary and career progression.

It surveyed over 800 women about their experiences and priorities working in the technology industry. Despite the implementation of equal pay legislation in the US and UK, the report revealed that pay is still a key issue for many of the respondents. Nearly two in three (64 per cent) stated that equality in pay and benefits is the main factor that would attract them to a new role, while 46 per cent suggested the industry still needs to close the gender pay gap to encourage more women into the industry. The perception of a 'glass ceiling' holding women in technology back is greater in 2019, with 31 per cent citing this as a key challenge, up from 2018's figure of 24 per cent.

Sarah Lewis

Sarah Lewis, director of field marketing at Ivanti, said, 'Although some progress has been made, women in tech are still battling pay inequality and an organisational culture that continues to favour men in leadership positions. While women in tech movements are challenging the status quo, more needs to be done not only to entice talented women to work in tech but to make sure their aspirations are valued and supported.'

Business owners forced to stop paying employees due to late payment

Nearly half of small business owners and managing directors (47 per cent) have had to stop their own pay due to the impact of unfair payment practices by their buyers, according to new survey findings from the Electrical Contractors' Association (ECA) and the Building Engineering Services Association (BESA).

Overall, three-quarters of business owners said they had made sacrifices including reducing their own salary (37 per cent), and cancelling company training and learning activity (23 per cent). Over one in three (36 per cent) say they have struggled to pay business taxes due to payment issues Almost seven per cent were forced to pay their own staff late – an action which can have devastating effects on employees.

ECA director of legal and business, Rob Driscoll, said, This shows the truly devastating effects late payment has

Rob Driscoll

on the lives of business owners, their staff, their children, and their wellbeing. With a lack of fair payment directly causing widespread mental health issues, abusive payment practices fundamentally remove the capacity for individuals to feel purpose or value. The data lifts the lid on the industry's self-harming commercial behaviour.'

Colt DCS appoints Niclas Sanfridsson as its new CEO

Colt Data Centre Services (DCS) has named Niclas Sanfridsson as its new chief executive officer (CEO). The move comes after Colt DCS's previous CEO, Detlef Spang, retired after leading the business since its inception as an operationally independent business from the Colt network business in 2015.

As CEO, Sanfridsson will continue to drive the hyperscale footprint of the business as the organisation continues to expand in both new and existing markets. He has a wealth of industry experience, most recent of which was with Pulsant, where he spent two years as the company

CEO. His previous roles include managing director of Equinix in the Nordic region, where he was focused on integrating the organisational alignment of Telecity into the Equinix portfolio following the acquisition of the Telecity Group.

Michael Wilens, chairman at Colt DCS, said 'We are confident that with almost 20 years of experience in running data centre businesses Niclas will lead Colt DCS into its next phase of growth and build further upon the customer success that we have seen in satisfying the requirements of our customers across the globe.'

WatchGuard warns of vulnerabilities in the 5G to Wi-Fi handover and attacks on mobile data networks in 2020

Attackers will find new vulnerabilities in the 5G to Wi-Fi handover to access voice and data on 5G mobile phones in 2020, according to the WatchGuard Technologies Threat Lab. With wireless carriers increasingly handing off calls and data to Wi-Fi networks to save bandwidth, particularly in high-density areas, flaws in this cellular to Wi-Fi handover process will allow hackers to compromise security.

'As 5G rolls out across large public areas like hotels, shopping centres and airports, users' voice and data information on their cellular enabled devices is communicated to both cell towers as well as Wi-Fi access points,' explained Corey Nachreiner, CTO at WatchGuard. 'While mobile devices have intelligence built into them to automatically and silently switch between cellular and Wi-Fi, security researchers have already exposed flaws in this handover process, and it is at highly likely that a major new 5G to Wi-Fi security vulnerability will be exposed in 2020.'

Corey Nachreiner

CNet Training launches digital badges for all certified individuals

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CNet Training will now issue digital badges to all successfully certified learners from education programs spanning The Global Digital Infrastructure Education Framework. Offering an easily identifiable way to recognise talent and reward accomplishments, they create a strong visual tool that can help enhance employee recognition, as well as strengthen job profiles for those seeking new career opportunities.

The badges are securely stored together and managed by the individual via their user account. From here, the badges can be easily shared via social media and can also be downloaded to verify any knowledge, skills and certifications gained. CNet Training is backdating the digital badges by three years to everyone who successfully completed a program or re-certified during this period.

Sarah Parks, director of marketing at CNet Training, commented, 'We wanted to create a talent recognition badge to showcase personal achievements. Paper certificates are great, but people don't carry them around, and they can often be misplaced. Having portable digital badges enables individuals to access their achievements directly and instantly on their devices. The benefits are huge, allowing individuals to clearly showcase their skills and certification and therefore stand out from the rest. For companies, showing the badges of their team members will help to enhance brand reputation and competitive advantage.'

Sarah Parks

New hotspots drive cost hikes in key data centre markets

Major global data centre markets are seeing soaring construction costs as development in new and emerging hubs continues to heat up, according to Turner & Townsend's Data Centre Cost Index 2019.

The research analyses input costs – including labour and materials – across 32 key markets, alongside industry sentiment and insight from data centre professionals. Globally, over 40 per cent of markets surveyed are showing 'hot' construction conditions – where competition for supply chain resources is putting pressure on budgets.

Cost pressures are contributing to the growth of secondary markets in key geographies. In California, Silicon Valley has risen to be the third most expensive place to build globally at a rate of $9.4 per watt. European markets are seeing a significant shift in the capital costs of hyperscale development in the dominant markets of Scandinavia, with Stockholm ($8.6 per watt) and Copenhagen ($8.5 per watt) now exceeding Frankfurt ($7.6 per watt), London ($8.5 per watt), Amsterdam ($7.8 per watt) and Paris ($7.7 per watt).

Dan
Ayley

Dan Ayley, global head of hi-tech and manufacturing at Turner & Townsend, said, 'Although our report points to certainty in delivery as the key issue for the sector across global markets, sustainability is one of the most pressing challenges coming down the track. With power density requirements for data centres increasing by as much as 50 per cent year on year, demonstrating steps towards decarbonisation needs to be a priority for how hubs are conceived, built and operated across their lifecycle.'

NEWS IN BRIEF

Schneider Electric won two categories at the SDC Awards 2019 for AI/Machine Learning Innovation of the Year and Edge Project of the Year.

Cudo Ventures has announced that Outlier Ventures has become the lead advisor and an investor to support the company's further growth and expansion.

Vertiv has announced it will become a publicly traded company through a merger with GS Acquisition Holdings.

HypeLabs has completed a $3m seed round led by innogy Innovation Hub.

EfficiencyIT won IT Systems Reseller and Managed Services Provider of the Year at the SDC Awards 2019.

Equinix has announced the availability of private connectivity to Microsoft Azure ExpressRoute cloud services at Equinix International Business Exchange (IBX) data centres in Frankfurt, Geneva, Milan, Stockholm and Zurich.
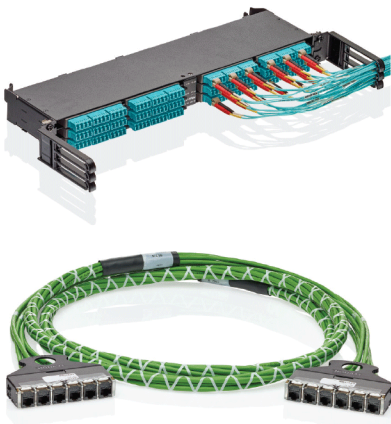
Avoiding a **catas**

Hi Rob

Picture the scene. It's another rainy Wednesday and you make it into the office early so you can get working on the list of 'to-dos' that has been growing since the company's expansion. It was definitely worthwhile taking the job with this ambitious start-up – it is going from strength to strength. Its innovative online only service has taken the market by storm and in Q1 next year it will be floated and investors will be swarming.

A couple of hours into the day and your inbox starts to light up. It's the CEO complaining that the website is sluggish today and asking if there are any IT issues. You realise that the small air conditioner on the wall, which has been given the responsibility of keeping your whole system online, is currently omitting a death rattle and flashing warning lights at an alarming rate.

Minutes later, the room temperature is climbing and one by one the servers begin to switch into protection mode, while preparing to switch off altogether. With no means of cooling the room, the issue only escalates and, as more equipment is rendered inactive, more customers lose access to your platform.

Opening the door and letting desk fans blow warm air around the room will do very little to mitigate the issue and now your phone has started to ring. Management wants to know what's going-on, asking why is the app down?

Meanwhile, social media is already alive with a flurry of posts mentioning the loss of service, something that is sure to make the news outlets and affect the company valuation!

This scenario, and many like it, happen over the world with alarming regularity. It may not always be on this scale, but this chain of events can have a huge effect on business operations:
• What information could be lost?
• What level of service disruption could this cause?
• Who would be affected? Colleagues? Your customers?
• What are the long-lasting effects of even a short outage?
• How does it affect your reputation?

If you have any degree of responsibility to ensure the health and overall uptime of critical IT equipment, the implementation of adequately specified cooling is a simple one.

The years of making do with a comfort cooler in the corner chugging away are gone. IT equipment is getting smaller with every iteration and thus the density of a standard IT rack is increasing. This means

strophe

higher and higher heat loads need to be managed effectively.

You need equipment that is designed specifically for cooling IT loads, not humans. Something that reacts instantly to changes in temperature, and is constantly monitoring the health of the environment with the ability to alert you instantly to any issues so they can be mitigated before true problems arise.

IT cooling does not have to be expensive or complicated, but it does need to meet the rigours of the real world and perform when it matters. That can mean the difference between customer satisfaction and pushing them into the arms of the competition.

Karl Lycett
Rittal

Editor's comment

The scenario Karl outlines here should make IT professionals break into a cold sweat! And he's absolutely right, cooling cannot be left to chance and correctly specified and installed equipment can help ensure uptime.

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Made to measure

For over a decade The Green Grid's Power Usage Effectiveness (PUE) metric has been the de-facto method of benchmarking a data centre's energy efficiency. However, it has not been without its critics and with other ways to assess a data centre's performance in this area, Inside_Networks has assembled a panel of industry experts to examine whether PUE is still relevant

▶ In February 2007, the very first white paper published by The Green Grid called Green Grid Metrics: Describing Data Center Power Efficiency proposed the use of the PUE metric. PUE was developed to enable operators to quickly estimate the energy efficiency of their data centres and determine if any energy efficiency improvements need to be made.

'reinterpreting' the way that it is used. These types of claims are usually met with equal parts scepticism and derision and, in turn, have devalued the impact of the PUE metric.

With the widespread emphasis on energy efficiency showing no sign of lessening, PUE, if used properly, has the potential to provide a valuable insight into a data

IS THE GREEN GRID'S PUE METRIC LOSING ITS RELEVANCE WHEN IT COMES TO REPORTING ENERGY USE WITHIN DATA CENTRES? WHAT IS THE BEST WAY FOR DATA CENTRE OPERATORS TO ACCURATELY PREDICT AND ASSESS HOW MAKING POWER RELATED CHANGES TO THEIR FACILITIES WILL AFFECT OPERATIONS AND MAKE THEM MORE EFFICIENT?

PUE is ascertained by dividing the amount of power entering a data centre by the power used to run the computer infrastructure within it. PUE is therefore expressed as a ratio, with overall efficiency improving as the quotient decreases toward 1.

Getting as close to the magical figure of 1.0 has become something of an industry obsession. However, a PUE of 1.0 is considered impossible to achieve, as it suggests there is absolutely no power loss – defying the law of physics – and also no utilisation of any other ancillary power needs within the data centre.

This hasn't stopped some data centre operators claiming to have remarkably low PUE ratings though, by

centre's performance and help customers understand how a facility addresses the issue. However, the widespread abuse of PUE has lessened the impact of, what is in theory, a very useful metric and marketing teams the world over have simply hijacked it, manipulated it and reinterpreted it in order to make their data centres appear more attractive.

To assess the current situation and examine whether PUE is at all relevant in today's data centre sector, Inside_Networks has assembled a panel of industry experts to discuss the issue.

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

PUE is now an international standard – ISO 30134-2 – and it is very specific about methodology and reporting. However, I suspect that many organisations are misusing or misreporting it.

Its real purpose is as an improvement metric – you measure to get a baseline, you adopt improvements and you measure again, thus it is site specific and should not be used to compare sites. Losing its relevance? No, it, as well as a host of other metrics such as Carbon Usage Effectiveness (CUE), Renewable Energy Factor (REF) and Energy Reuse Effectiveness (ERE) should be reported properly! We need to go beyond PUE!

One way for data centre operators to predict and assess how effective making power related changes is, is to use modelling software specifically designed for data centre use, and use the 'what if' option – there are a few on the market. There may be an option on any data centre infrastructure management (DCIM) tools already installed in the facility to assist in this task.

The best thing for an operator to use to predict and assess how to optimise their site for efficiency is to adopt and participate in the EU Code of Conduct for Data Centres (Energy Efficiency), or EN 50600-TR-99-1, where there are over 150 best practices that can be used to reduce energy consumption. They should then retain an expert in the EUCOC to assist them.

The EU Code of Conduct is a journey. Start at the beginning and work your way through every section – management,

IT, cooling, power, design aspects, and monitoring and measurement. It's surprising how many organisations cherry pick the practices, implement a solution and find that the results were not as first promised, or in some cases contribute to an increase in energy.

The implementation of an ISO 50001 energy management system will also create a structure that forces you to review energy management and via the Plan, Do, Check, Act cycle this could yield substantial savings.

Finally, consider how legislation such as Streamlined Energy and Carbon Reporting (SECR) and Energy Saving Opportunities Scheme (ESOS), as well as participation in the Climate Change Agreement (CCA) for Data Centres, can help you find budget for the project. Normally spending money on the tools will save energy and, in some cases, quite a bit.

'The best thing for an operator to use to predict and assess how to optimise their site for efficiency is to adopt and participate in the EU Code of Conduct for Data Centres (Energy Efficiency), or EN 50600-TR-99-1.'

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Certainly not! PUE was only intended to be a measure of the infrastructure energy overhead of the facility.

Design PUE is based on 100 per cent load and annualised to include all seasons. PUE varies with load, with most data centres operating at partial load and climate, but it does not represent any measure of the effectiveness of the ICT load – either in its performance per watt or its utilisation and idle power.

For example, the average ICT load in the colocation and enterprise sector is typically <40 per cent with the hardware utilisation <20 per cent – hence the ICT output per watt is low. Then the facility claims a PUE of 1.4 but neglects to mention that this is the design PUE and it is running at 1.7 – better than the EU Code of Conduct average – thus disguising the waste of energy. Compare that to a hyperscale facility that will have a load of 80 per cent, ICT utilisation of 40 per cent operating at the same PUE, thus using only 10 per cent of the energy per unit of compute but the same PUE.

However, in my opinion, the people who now want to ditch PUE are trying to hide the truth about their utilisation and idle power. Mind you, we have an excuse – 1kWh burned in a typical enterprise facility generates at least £150 of revenue. The energy cost is 1/1500th of the business generated, but can this excuse our behaviour?

The point is that sustainability should only be achieved in three steps – reduce the load, improve the effectiveness and then power from renewable sources. Unfortunately, our industry is trying its best to increase load by offering ever more applications. We try to ignore the ICT hardware performance and concentrate on PUE and then think it is a good idea to apply renewable energy to the system. In effect we are wasting a valuable resource.

So to achieve better 'effectiveness' we should start with the ICT hardware – buy the fastest per watt (there is a 200:1 difference between worst and best), make sure we don't idle it (there is some hardware that idles at 80 per cent of the full power), only then worry about PUE (especially for partial load) and, finally, buy renewable energy. But we should not stop there – we should reuse the waste heat.

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> 'In my opinion, the people who now want to ditch PUE are trying to hide the truth about their utilisation and idle power.'

WENDY TORELL
SENIOR RESEARCH ANALYST AT SCHNEIDER ELECTRIC

The PUE metric has had an important role in making data centres more efficient. It brought to light the 'waste' that was occurring in data centres, specifically as it relates to the overhead of energy from the physical infrastructure systems.

PUE also led to many improvements in data centre designs, including implementation of economiser modes to reduce the need for year-round mechanical cooling systems, raising temperature setpoints and adding containment systems to improve cooling performance.

However, I have always been of the belief that reporting a PUE without additional context can be misleading. For instance, benchmarking a PUE of one data centre to another, without understanding attributes like the IT load percentage, location, climate, and which systems are included in the total energy number, could result in an 'apples-to-oranges' type of comparison.

It's not a perfect metric. If one's improvement objectives are based solely on obtaining a better PUE number, operators might find themselves questioning energy reduction practices like virtualisation or turning off abandoned 'zombie' servers, since these practices reduce the IT load and, therefore, make PUE worse.

It also can be challenging to account for all of the supporting infrastructure if your data centre is in a 'mixed-use' facility such as a corporate office building. Measuring or estimating power consumption for shared resources such as generators and chiller plants adds another level of complexity.

Over time, as demands change and the technology in data centres continues to evolve, new challenges will present themselves regarding the PUE metric. For example, the line is being blurred with where the IT power draw ends and where the physical infrastructure power draw begins. Liquid cooling, for instance, eliminates fans inside the server, which makes your IT load smaller.

Whenever you reduce the IT load, you have the reverse effect on PUE. Open Compute Project (OCP) is another one – power supplies once inside the servers are now being consolidated at the rack level, which further brings into question the boundary.

Overall, PUE can be used to provide great insight into the physical infrastructure overhead but should be used in conjunction with other metrics like Water Usage Effectiveness (WUE) and total energy consumption. It is one piece of the energy puzzle.

> 'PUE can be used to provide great insight into the physical infrastructure overhead but should be used in conjunction with other metrics like Water Usage Effectiveness (WUE) and total energy consumption.'

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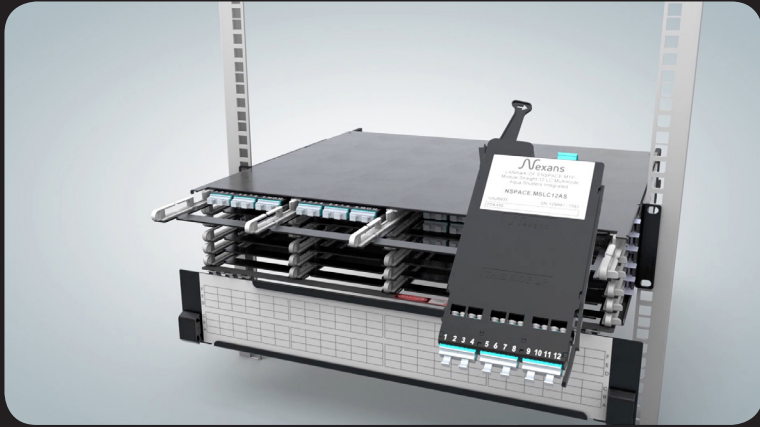
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NEIL LATHWOOD
CHIEF TECHNOLOGY OFFICER AT UKFAST

The PUE metric focuses on how efficiently a data centre uses its power, based on mechanical and electrical systems operating a compute function, but doesn't focus on the overall output of the data centre, so it's a rough benchmark and not much more.

An efficient data centre should focus on the power and cooling efficiencies, combined with the throughput of data. This gives a much more effective metric on data centre efficiency, as it combines the whole process. Unfortunately, it is much more difficult to calculate or capture overall efficiency, especially in colocation facilities.

Redundancy also skews the equation. Power and cooling systems need to be efficient, but adding redundancy means there will always be inefficiencies. Customers demand uptime, so redundant elements must be installed and the higher the redundancy the more the potential for inefficiency.

By putting more load on the IT equipment, with high IT load and low cooling load, the PUE figure will look more efficient. In reality, the compute function is generally the least efficient equipment in a data centre and server lifespans can be dramatically reduced by overheating, so it's a false economy in terms of environmental impact.

You can't manage what you don't measure. Data centre operators need to understand what power they use across the entire process and look to deliver efficiencies based on the data they're processing. Operators should select equipment that fits their compute function. A one size fits all approach isn't always the way forward. If you operate colocation facilities then clients' needs can be very diverse, for corporate functions the environments can be a little easier to predict.

There's no free lunch in data centre efficiency, so elements that might be power efficient can still be expensive to run through ongoing maintenance costs. Simple housekeeping can generate major efficiencies. Look at whether individual data halls are being used efficiently and if your mechanical and electrical systems are reaching end of life. Technologies may well have moved on dramatically since the original installation and some investment now can pay dividends in efficiencies down the line.

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'An efficient data centre should focus on the power and cooling efficiencies, combined with the throughput of data. This gives a much more effective metric on data centre efficiency, as it combines the whole process.'

MICHAEL WINTERSON
MANAGING DIRECTOR EMEA AT EQUINIX

Digital transformation affects every industry, but as customers embrace such digitisation, the load on data centres grows. This makes sustainability of operations paramount.

Data traffic has accelerated at an unprecedented rate in the past 10 years, and while this doesn't mean the PUE metric has lost relevance, its remit has had to be expanded to incorporate sustainability metrics, integrating renewable energy sources into overall considerations.

Measurement in this area is critical as enterprises globally re-architect their IT frameworks, and data centre operators – and their customers – face new challenges to minimise their carbon footprints. It becomes incumbent on the biggest data centre companies to show leadership in creatively tackling the biggest issue our industry faces – minimising the environmental impact of the world's digital progress.

Trialling and implementing forward thinking technology and designing and retrofitting data centres with cutting edge sustainable technology is the only way forward. We must also be willing to share best practices for industry-wide improvement. Only then can we make progress on the environmental sustainability that is fundamental to our industry's success. Customers are much wiser to the impact too. Since the Paris Agreement was signed in 2016, there has been a noticeable shift in queries over how they can better use resources to cut CO2 emissions.

Design is key – whether that is concentrated on building materials, the energy efficiency of components, new and improved ways of cooling, or the global purchasing of renewable energy. Even covering roofs with plants which recycle CO2 can help to lower cooling costs and prevent stormwater runoff from polluting local water sources. Rooftop solar photovoltaic systems can also supplement power from the local grid.

The future of data centre energy requires innovative thinking, investment and a great deal of effort and persistence. Utilising machine learning and artificial intelligence (AI) to give an unrivalled view of what is happening with our footprints should underpin future thinking.

Only by instituting a long-term vision can we accurately predict and assess how to make power related changes for the better. Much is being done, but there is still much more we can all do, working individually and collectively to remain accountable – and third party measurements to validate approaches are still a very important part of that.

> '**Data traffic has accelerated at an unprecedented rate in the past 10 years, and while this doesn't mean the PUE metric has lost relevance, its remit has had to be expanded.'**

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Unit 104: Copper Cabling in an Internal Environment
3 days
20th to 24th Jan
16th to 20th March

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Comms Centre.

NICKY THOMPSON
BUSINESS DEVELOPMENT AT EDGETIC

It's time to review the PUE measurement. Perhaps it still has a part to play as an operational metric, but in the 13 years since PUE was created, there have been significant changes in thinking about what is best practice in data centres, coupled with new challenges and requirements. It will not be an easy task, as there are many differing views and many angles to be considered.

Although there is a standard for measuring PUE, it is not a regulation and, as such, is open to interpretation – and potentially manipulation.

The true efficiency of a data centre is what everyone is interested in and this is not the information which the PUE metric offers. There may be instances where increased energy usage could be being applied to create greater efficiency. A measure of both efficiency and resiliency could potentially provide a more useful metric.

To determine the efficiency of a data centre, we need to collect more detailed baseline data by delving deeper into the performance of the IT stack. Understanding server workloads and performance is key and although this is more invasive than simply looking at the IT load – and will produce enormous amounts of data – it will enable operators to have a much clearer understanding of the way a data centre is performing. Just as importantly, it will show where adjustments can be made in order to achieve greater gains in not only efficiency, but also throughput and latency, for example.

It seems to be generally accepted that the energy saving gains available from hardware adjustments have now largely been exhausted, which means that clever software is likely to be the key to achieving further economies. By harnessing the potential of innovative new software technology that uses machine learning and AI, we have the potential to fine-tune operations to good effect, helping to reduce costs and working towards reducing a data centre's carbon footprint.

A new metric is needed, but it won't necessarily be any easy task and maybe, when one is found, it also needs to be regulated in order to offer true comparisons.

> 'The true efficiency of a data centre is what everyone is interested in and this is not the information that the PUE metric offers.'

Eighth wonder

Matthias Gerber of R&M looks at whether there is a place for RJ-45 Cat.8 in the local area network (LAN)

▶ Is there a place for Cat.8 cabling and RJ-45 connectors in today's LAN applications? To find the answer to that question we need to first look at current and upcoming developments in data and how this affects network speed requirements.

ALL CHANGE

The speed of technological change is increasing, and the quantity of downloaded data is doubling every year. This, in turn, is having a knock-on effect in terms of bandwidth requirement for certain applications. Inevitably, network designers, specifiers and installers will need to decide what to invest in.

Since the 1990s, data rates have closely followed a trend curve, developing in line with Moore's Law until 2010 and increasing more slowly since then. By 2020, we believe that the communication in data centres between switches will operate on 100GBASE-X, server access will use 40GBASE-X and LAN will operate on 10GBASE-T.

Historically, the time between the launch of a new standard and full coverage implementation in the LAN has always taken just under a decade. Therefore, when implementing future proof LAN cabling, the best practice is to rely on the most up to date standard at the time the decision has to be made. The reason is simple – the 10-15 year expected lifespan of LAN cabling is considerably longer than the

generation cycle of the electronic equipment. Up to five generations of network devices have to run on one LAN.

If the LAN cabling cannot be used for its full lifespan due to insufficient bandwidth, and therefore has to be replaced early, the original investment has to be written off at a correspondingly faster rate. 40GBASE-T was published by IEEE in 2016. If LAN cabling is to remain usable beyond 2026, it makes sense to proactively prepare for this. This is because upcoming applications such as broadband hotspots, DAS for 5G pico-cells, WAP/WiFi6 and 8kUHD2 are particularly bandwidth hungry. It is foreseeable that these applications will need bandwidths beyond 10Gb/s.

BACK TO FRONT

The prevalence of RJ-45 applications and full backward compatibility with existing cabling systems – down to Category 6A – means that using Cat.8.1 and RJ-45 connectors continues to make sense.

Cat.8.1 can also be used in the LAN environment with the 25GBASE-T variant. The 1600MHz transmission frequencies required for a 40Gb/s data rate limit the

attainable link length to 24m, owing to the high attenuation values of cabling at these frequencies. At 10Gb/s and 400MHz, the link length is 90m.

Estimates for 25Gb/s and 1000MHz suggest an attainable link length of around 50m. Achievable length is examined in more detail in the technical report from ISO/IEC TR11801-9909. The extended reach of 25GBASE-T, according to DTR 11801-9909, will enhance the usability of Cat.8.1 in the LAN environment. In many real world installations, a significant number of workspaces would benefit from

a larger bandwidth. With an achievable link length of 50m, around 60 per cent of all links can be covered in the LAN environment, making Cat.8.1 a feasible solution for the LAN.

POINT OF PRINCIPLE

When it comes to data centre cabling, we may assume that adaptation mainly depends on prices and availability of terminal equipment. In principle, there are two use cases for data centres – top of rack (ToR) and end of row (EoR). In data centres Cat.8.1 for 40GBASE-T is in competition with existing,

> 'Cat.8.1 – the current high-end RJ-45 technology – should be able to cover cabling needs for the next 10-15 years. Because Cat.8.1 is fully compatible with existing installations and equipment, existing patch cords can be used.'

proven 40GBASE-X technologies (FO and DAC). However, Cat.8.1 simplifies the migration from 1Gb/s to 10Gb/s to 40Gb/s.

With EoR designs, Class I cabling is an affordable, flexible and backward compatible alternative to multimode fibre optic stretches on an MPO basis as a permanent link between server cabinets and the switch cabinet for 10/25/40Gb/s transmission rates.

The limitation of the PL length to 24m is insignificant in this application as required lengths are usually far shorter. With ToR implementation, a Cat. 8.1 patch cord with 40GBASE-T can replace existing QSFP connections at a low price and high density.

SMART ZONE ASSIGNMENT
Today's open plan offices are often divided into zones, for several reasons. Bandwidth can be defined differently to suit specific workplace purposes, to avoid increasing the number of floor distributors with electronic equipment.

• 40Gb/s zone
A workplace zone with up to 40Gb/s can be set-up in a radius of 24m around the floor distributor. This is an ideal environment for development departments and multimedia departments with large bandwidth requirements for image editing.

25Gb/s zone
The new workplace standard. Experience indicates the average length of a PL in the LAN area is 40-50m. The majority of connections in a LAN would be in this range and would also permit demanding tasks. Service outlets (SO) could often be positioned in this area for high-speed WLAN connection points.

• 10Gb/s zone
This covers all remaining building connections. In the future, it will also be sufficient for 'normal' office workstations, building automation, printer connections and production lines.

The advantage of this concept is clear – a standard cabling structure with one cable type and one connection module type simplifies initial cabling and, subsequently, maintenance. As soon as the required electronic equipment is available, it can be connected and the increased bandwidth is available immediately without the need for
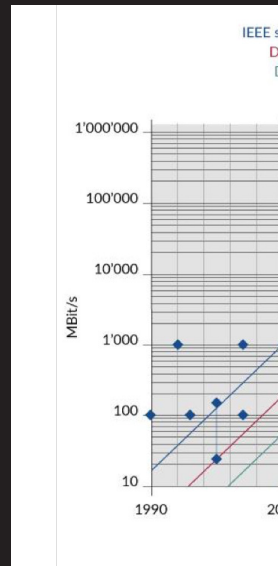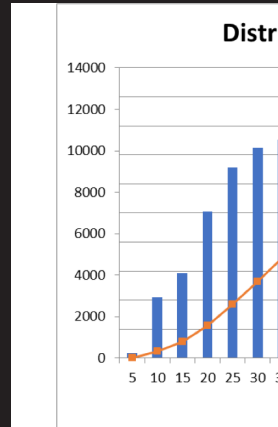
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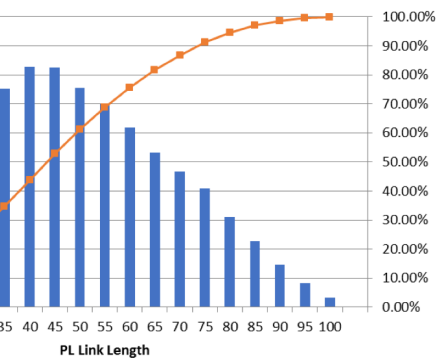
existing patch cords can be used. What's more, Cat.8.1 is widely available, can be used immediately, is based on proven, familiar base technology and allows power over Ethernet (PoE). ■
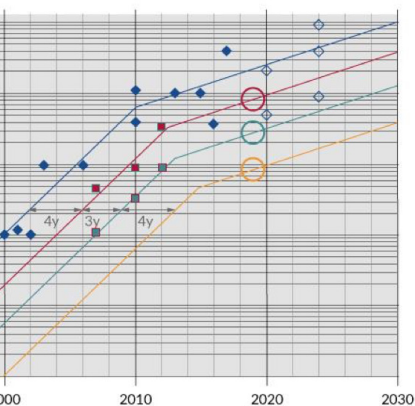
any new cabling or adjustments to outlets. The prerequisite for this solution is the use of RJ-45-based, backward compatible cabling components.

A RELIABLE CHOICE

Cat.8.1 – the current high-end RJ-45 technology – should be able to cover cabling needs for the next 10-15 years. Because Cat.8.1 is fully compatible with existing installations and equipment,

MATTHIAS GERBER
Matthias Gerber, market manager LAN cabling with R&M, has worked in the cabling business in various positions within R&M for over 25 years. He has ample experience in the development and marketing of cabling systems and RJ-45 connectors. In addition, Gerber is a participating or past member of various standardisation bodies (IEC, ISO/IEC and TIA), as well as chairman of the Swiss National Mirror Committee for TC48.

Excel Networking Solutions

Excel Networking Solutions offers one of the market's most comprehensive ranges of copper cabling solutions. Inclusive of Category 5e, 6, 6A, 7A and 8 copper cable classes, Excel's structured cabling products constitute an end-to-end solution where performance and ease of installation are prerequisites.

Having evolved to face industry challenges, Excel offers high density designs as a space saving solution, such as the 0.5U patch panel and reduced diameter cabling. When a system is installed by an Excel Cabling Partner, a 25 year warranty can be awarded, covering product and applications assurance of compliance with industry performance standards appropriate to the class of copper cabling being installed.

Excel also offers a pre-terminated copper solution as part of its Specialist Support Services, which are carried out by specialised, knowledgeable technical staff and go through a rigorous quality check before delivery.

The full portfolio of Excel's copper cabling products is also available in the dedicated Excel Copper Catalogue. **CLICK HERE** for further details. **www.excel-networking.com**

R&M

R&M's range of high-density ELISO patch panels has been extended with an angled 19-inch model. This saves network technicians and installers steps in assembly and cable management in the rack.

The panel offers space for 48 ports on 1HE, while RJ-45 connections for copper cabling are arranged in two rows. Cat.6A EL and Cat.6A ISO special connection modules independently lock into the panel's module holders, and installers simply click the modules into the holder.

Mounting is completed without screws, brackets or other mechanical aids. Cables are routed flat, parallel and stress free. Simplified handling also requires less time to be spent on cable and network management. The solution avoids diminished performance caused by narrow radii, kinking and cable movement.

To find out more **CLICK HERE.** **rdm.com**

Comtec

Comtec is the UK's largest independently owned distributor of copper cabling systems, with solutions from the industry's leading brands including Draka, HellermannTyton, Molex, CommScope NETCONNECT, Nexans, Siemon and CommScope SYSTIMAX.

These, together with the proven, long-established and price competitive Ultima solution, mean that we have a cabling system to support every project and every budget. With options for Category 5e, 6, 6A and 7A there is a copper cabling system to support even the most demanding application.

Comtec offers everything required for your copper cabling installation including cables, patch panels, patch cords, POD boxes, work area outlets, cabinets and much, much more. With items available for free next day delivery and access to friendly, knowledgeable support staff, Comtec offers the service and support you need to deliver projects on time and on budget.

To find out more about the range of copper cabling systems available from Comtec **CLICK HERE.**
www.comtecdirect.co.uk

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Leviton

Leviton offers complete end-to-end copper systems – with both cable and connectivity – from one global solutions provider. All products are manufactured in our Leviton owned facilities in the US and UK.

Leviton systems are used in many different environments including data centre infrastructure, education and healthcare. The end-to-end systems are of superior quality, and Leviton offers unbeatable service and support throughout a product's life.

Leviton copper systems include category rated systems, cable management, make-to-order products and Construction Products Regulation (CPR) rated cable. They support applications such as power over Ethernet, digital buildings and enterprise wireless.

CLICK HERE to learn more about Leviton's end-to-end copper systems and related products.
www.levitonemea.com

Corning Optical Communications

Corning Optical Communications offers a comprehensive range of products for all copper cable requirements. This includes Cat.5e to Cat.6A shielded copper cable solutions (U/FTP, F/FTP, and S/FTP) and UTP cables from Cat.5e to Cat.6A.

From Cat.6 upwards, we offer a number of B2ca products, which meet the highest standard of the Construction Products Regulation (CPR) for telecommunication cables intended for permanent installation inside of buildings and construction works.

Our RJ-45 Cat.6A shielded and UTP jacks are a key component of our copper interconnect product range. Also available in Cat.6 shielded and unshielded, each jack component is able to terminate to any certified Cat.6A cable and patch cord combination to achieve full channel performance. The jack's unique three cable entry points help make installation simple and the traditional one click design enables an easy, tool-less termination on unshielded twisted pair cables.

For more information, contact your distribution partner or **CLICK HERE.**
www.corning.com

CLARITY® HIGH DENSITY COPPER SOLUTION

THE NEW HIGH-DENSITY CLARITY® JACK AND PANEL PRODUCTS SOLVE DENSITY CHALLENGES WITHOUT SACRIFICING PERFORMANCE.

The smaller HDJ jack footprint allows up to 48 ports of premium Category 6a, 6 or 5e performance in 1 rack unit panel. This system is ideal for applications like data centres, distribution areas (TIA-942 Standard) or limited space, high density environments.

Ortronics® HDJ patented, recessed angled modular patch panels combine with Ortronics vertical cable managers to provide up to quadruple the density as standard panels with horizontal cable managers.

OR-HDJ6-45   OR-HDJ6A-36   OR-HDJ5E-88

THE NEW HIGH-DENSITY JACK AND PANEL SERIES PROVIDES:

– Less required rack and floor space to reduce real-estate costs

– A nearly transparent signal path, when used with Clarity patch cords, for enhanced network performance

– New cable termination process that is easier and faster for Category 6a and 6

– A new slide-lock mounting for a quicker installation time that reduces labour costs, while locking the jacks firmly in place

– Flexibility by combining copper and fibre in the same panel

Game changer

Stuart McKay of Panduit looks at how the built environment is going digital with power over Ethernet (PoE)

▶ Ethernet and PoE have become integral parts of building information modelling (BIM) and building management systems (BMS), creating a foundation for high performing environments. The latest standards and applications are developing a platform for increased employee productivity, with better health outcomes, improved safety and connectivity. With the merging of technologies does the network installer have the flexibility, understanding and desire to expand their capabilities to become the de facto contractors for this consolidated market?

STANDARD ISSUE
Ethernet, and specifically PoE infrastructure, is becoming the dominant technology platform. Ethernet cable infrastructure for combined power and data communications solves smart building connectivity, power delivery, network topology and supports thermal management requirements.

Building owners are turning to digital infrastructure to help reduce energy use, lower greenhouse gas emissions and meet energy use requirements. New generations of digitally native architects and designers are leading the efforts to attain net zero emission buildings. They recognise that technology capable of reducing installation costs and driving operational efficiency must be embraced.

BIM AND BMS

As BIM models advance and become interoperable it drives technology integration into building operation. Ultimately, the goal is to develop interoperability between BIM, BMS, IT, the internet of things (IoT) and manufacturing based on open standards. As this evolves, one estimate is that more than one billion sensors and connected devices will be deployed globally in buildings by 2021, alongside the billions more mobile devices brought into buildings by tenants, employees and visitors.

Model data from TSB-184-A
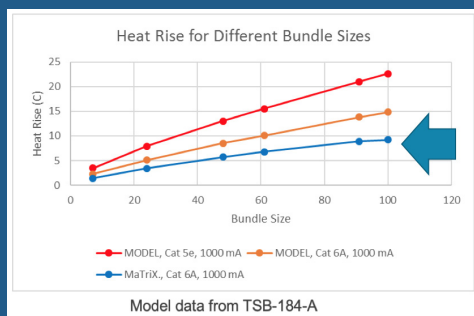
Device integration into buildings requires cabling infrastructure which meets or exceeds the latest communications, power and thermal standards, and does not add to network complexity and cost. The latest standards from the IEEE PoE++ – IEEE 802.3bt Type 3 and IEEE 802.3bt Type 4 – are driving the adoption of PoE for integrated communications and power in new builds and in replacement infrastructure in refurbishments. These standards provide for PoE to deliver up to

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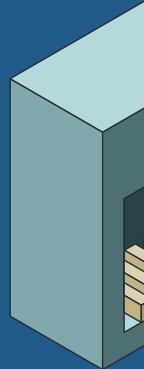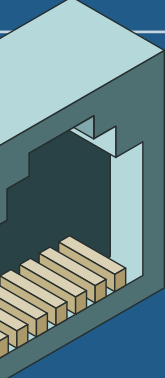
99W over twisted pair cables – enough to power the latest lighting, wireless access points, cameras and more.

- Susceptible to EMI - Antenna effect
- EMI performance much improved
- Best UTP EMI immunity

Continuous Barrier Tape

Discontinuous Barrier Tape Repeating Segment Length

Discontinuous Barrier Tape Varying Segment Length
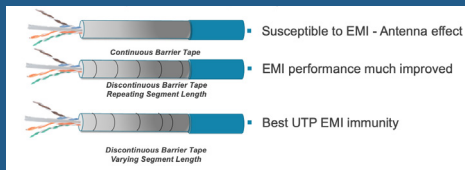
With the expected explosion in data across the network, Category 6A cabling supports the highest data rate of 10GBASE-T, with a recommended bundle size of 24 cables. Some Category 6A cable features an integrated tape and discontinuous foil that offers advanced thermal properties for handling the heat rise within cable, as well as alien crosstalk suppression and UTP electromagnetic interference immunity. It can offer a reduction in diameter and weight of around 23 per cent over comparable systems, whilst remaining compliant with Euroclass B2ca, Cca, and Dca flame and UL Listed CMP-LP (0.7A).

Competition

Vari-MaTriX
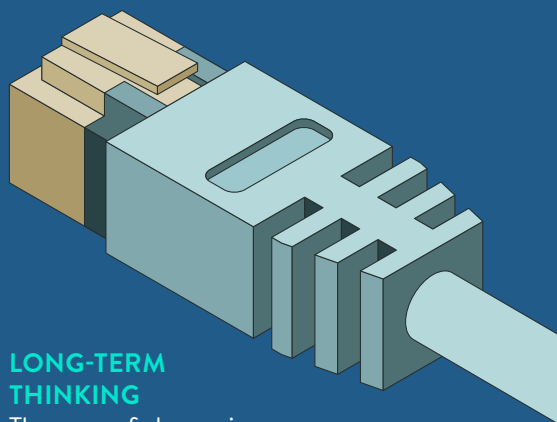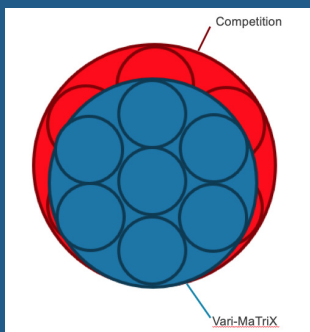
LONG-TERM THINKING

The pace of change in consumer technology and endpoint IT continues to accelerate. So, it is vital to choose a standards based technology with a clear roadmap. Ethernet is the LAN communications standard for data, providing decades of stable, high performance network infrastructure.

Buildings are becoming digitally connected with infrastructure that supports all the applications to optimise operations. BMS are becoming pervasive, with applications constantly developing and increasingly responsive. This expansion of capabilities inevitably led to these applications being transferred onto the data infrastructure plane.

PoE runs over a standard copper channel, which is limited by structured cabling standards to 100mm. Normally, any channel longer than 100m can experience performance issues, reduce network performance and impact the device or system. However, devices are available that extend data and power up to 610m over one standard copper cable, offering data rates of up to 100Mb/s, providing increased network flexibility.

SECURITY GUARD

Education, hospitals, government and other public buildings must balance the needs for accessibility and security to

'The convergence of applications on to PoE will remove the trade silos that segment design, installation and management of intelligent buildings.'

infrastructure devices over a single network. Its performance opportunities, whilst reducing cable congestion, establish PoE as the physical layer for these smart technologies.

ensure a building's physical security at access points, and facilitate the expansion of video monitoring. Another change is the future direction of buildings in urban environments is upwards. That means major changes to modern buildings as multi-use and shared environments become ever more common, increasing the need for secure access monitoring and control.

Low voltage cameras, embedded sensors, kiosks, wireless access points, physical access points, digital signage and displays are being deployed in ever greater numbers. Market forecasts show an explosion in the number of devices about to enter buildings. Wireless access point numbers alone are forecast to expand by 30 per cent per year until 2027. Kiosks and digital screens will become ubiquitous in multi-use environments.

A single network has positive implications for ease of installation, lower maintenance and provides better performance and interoperability between different building elements. PoE is a proven, viable, cost effective solution to power digital building

MEETING THE CHALLENGE
New topologies for network infrastructure allow switches to directly control power and data communication to the device. Common challenges such as crowded cable pathways can be address by using solutions with smaller cable diameters, angled connectors and high-density patching, releasing space that would otherwise be used for cable management and making room for active gear or switches. Ultimately, the convergence of applications on to PoE will remove the trade silos that segment design, installation and management of intelligent buildings. Network and systems installers understand structured infrastructure and are well placed to take advantage of convergence in the market. ■

STUART McKAY

Stuart McKay is senior business development manager for enterprise at Panduit Europe. He is an electrical engineer and is Panduit's lead for the development of PoE technologies in the EMEA region.

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MISSED AN ISSUE?
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R&M strengthens its market position in Europe

R&M has appointed Grigoris Panagos as its new sales manager for Greece and Kim Ciesla as sales manager for The Nordics.

Panagos has over 16 years of experience in the connectivity and telecom sectors. During his career he has worked on various challenging projects, providing professional expertise and extensive knowledge in the fields of sales and marketing. Ciesla is based in Denmark and has worked for several different companies including Prysmian.

Panagos commented, 'I am honoured to take this exciting opportunity to develop and strengthen R&M's status in Greece and work with the experienced team in south-eastern Europe. Ciesla added, 'I am proud and excited for this opportunity to develop R&M's position in the Nordics.'

Kim Ciesla

Grigoris Panagos

Mayflex forms distribution agreement with Hikvision

Mayflex has been appointed as a distributor for Hikvision, which will see it stock, supply and support the entire range of Hikvision products, with specific focus on IP solutions.

Hikvision is a world leading provider of security solutions and manufactures a full suite of comprehensive products and solutions for a broad range of vertical markets. The company's products also provide powerful business intelligence for end users, which can enable more efficient operations and greater commercial success.

Ross McLetchie, sales director at Mayflex,

Ross McLetchie

commented, 'We firmly believe in providing our customers with a choice of best of breed products in any given market sector. The rise and success of Hikvision in the UK market is clear for everyone to see, and we are genuinely excited to be in a position to drive further growth for the brand. We are seeing double digit growth in our security business, as more and more of our infrastructure customers adopt the sale and installation of IP solutions, and as security installers recognise the value Mayflex can add through its range of support, complementary products, and experienced staff.'

GlobalConnect forges SD-WAN alliance with Versa Networks

GlobalConnect has partnered with Versa Networks and is confident that the SD-WAN inspired partnership will help it accelerate productivity at its 18,000m² of data centre space and network of over 42,000km of optical fibre network.

'Our ideal partner needed to support complex cloud integration use cases, while being flexible and highly efficient

Sebastian Vad Lorentzen

in multiple deployment scenarios, and having a native focus on integration of security features – a combination of competences that are rare in the SD-WAN market space,' Sebastian Vad Lorentzen, head of SD-WAN engineering at GlobalConnect, explained. 'With the Versa Networks partnership, we aim to efficiently and securely manage more features with a higher level of flexibility across more domains and segments than practically possible with legacy technologies.'

CHANNEL UPDATE IN BRIEF

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At its 2019 Partner Summit Rittal awarded N&C the Top Growth award for the largest increase in business with Rittal in 2019. Ordin-Access was awarded the Top Project Performance accolade, while AODC received the Top Revenue award.

Vodafone Business is collaborating with Amazon Web Services (AWS) to make AWS Wavelength available in Europe. AWS Wavelength provides developers with the ability to build applications that serve end users with single-digit millisecond latencies over the 5G network.

Veeam Software has launched its enhanced Veeam Accredited Services Partner (VASP) program to strengthen its partners' capabilities to sell, deploy and support Veeam solutions.

Cloudhouse Technologies has been named as a Preferred Partner by AWS for the End-of-Support Migration Program (EMP) for Windows server.

Pulse Secure has formed a partnership with Cloud Distribution to grow its channel community across the UK.

CityFibre has pledged its support to the Armed Forces Covenant (AFC). Through signing the AFC CityFibre recognises the skills and talents of reservists and veterans, which it can tap into by offering them either work or apprenticeship opportunities.

Quick clicks
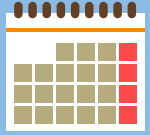
Your one click guide to the very best industry events, webinars, electronic literature, white papers, blogs and videos
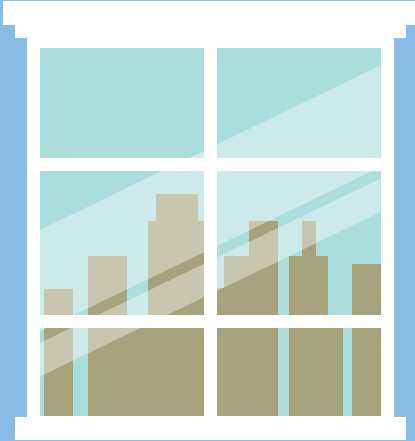
7 Reasons to Add Intelligence to Your Switch Presentation Panels is the title of a blog by Rahul Rathod of **Nexans.**
CLICK HERE to read it.

Essential Guidance on DCIM for Edge Computing Infrastructure is a white paper from **Schneider Electric.**
CLICK HERE to download a copy.

5G is Coming – Should LAN Installers Panic? is a blog from **Ideal Networks.**
CLICK HERE to read it.

Impact Of Cabinet Color On Data Center Lighting is a white paper from **Panduit. CLICK HERE** to download a copy.

How Do We Encourage New Engineers To Get Into Engineering? is the question posed by Amy Hillas of **Sudlows** in her latest blog. **CLICK HERE** to read it.

How Planning Reduces the Impact of Outages is a report from the **Uptime Institute. CLICK HERE** to download a copy.
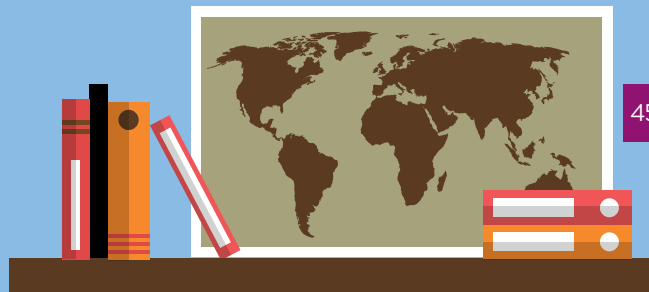
Leviton has published its latest Standards Report. **CLICK HERE** to read it.
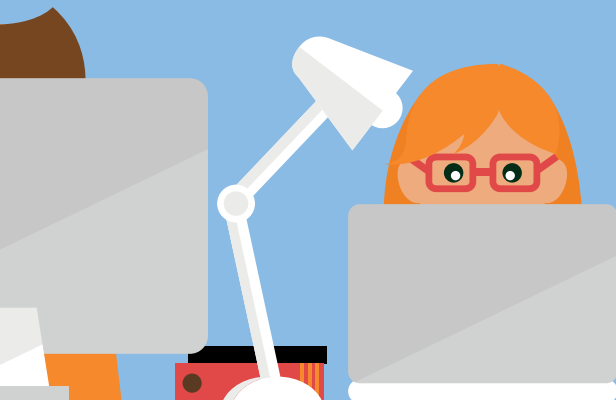
Think about it

Simon Bearne of Next Generation Data (NGD) examines colocation data centre service procurement in today's digital economy

▶ In today's hyperconnected digital economy, data centres are even more critical for ensuring non-stop IT systems availability – enabling competitive advantage, informed decision making, cost optimisation, improved productivity, faster time to market, responsive customer service and agility to react quickly to new opportunities.

DECISION TIME

Businesses must decide whether to continue investing in privately owned data centres or outsource to colocation operators. Despite the cloud having a significant and growing role in future planning, analysts predict roughly half of all enterprise workloads will not go into it. The non-cloud half will see the lion's share going to colocation, resulting therefore in an eventual overall workload split of 50 per cent to the cloud, 40 per cent in colocation and 10 per cent on-premise.

We are not at this stage yet, as the majority of the non-cloud portion is still on-premise. But as more CIOs turn their attention from what to cloudify towards how best to manage their remaining non-cloud workloads, the floodgates will open with a torrent of data heading into colocation facilities. For many, faced with ever decreasing IT planning windows and the escalating costs, risks and complexities involved in designing, building and managing their own facilities, colocation will be their only choice.

Therefore, the debate must no longer be solely focused on the cloud. There has to be more urgent consideration about the costs and risks of keeping data on-premise and which colocation facility is optimised for meeting individual business requirements. Even so, this can create something of a dilemma due to the sheer number and variety of colocation data centres available.

CAPITAL LETTER

Whether renting space and infrastructure for a few racks in a shared hall, or leasing a large custom designed private data hall, the wide choice and flexibility available is compelling.

Colocation data centres should increasingly be about economies of scale, physical security, vast amounts of power supplied resiliently, and efficient operation. But not all facilities are the same. In part this is due to the way prospective buyers tend to focus on particular criteria, only to find down the line there is huge unconsidered nuance underpinning the quality of data centre services. It is not helped by the industry typically focusing on a select few criteria, which can be poor indicators of how well positioned, invested and operated a particular site actually is.
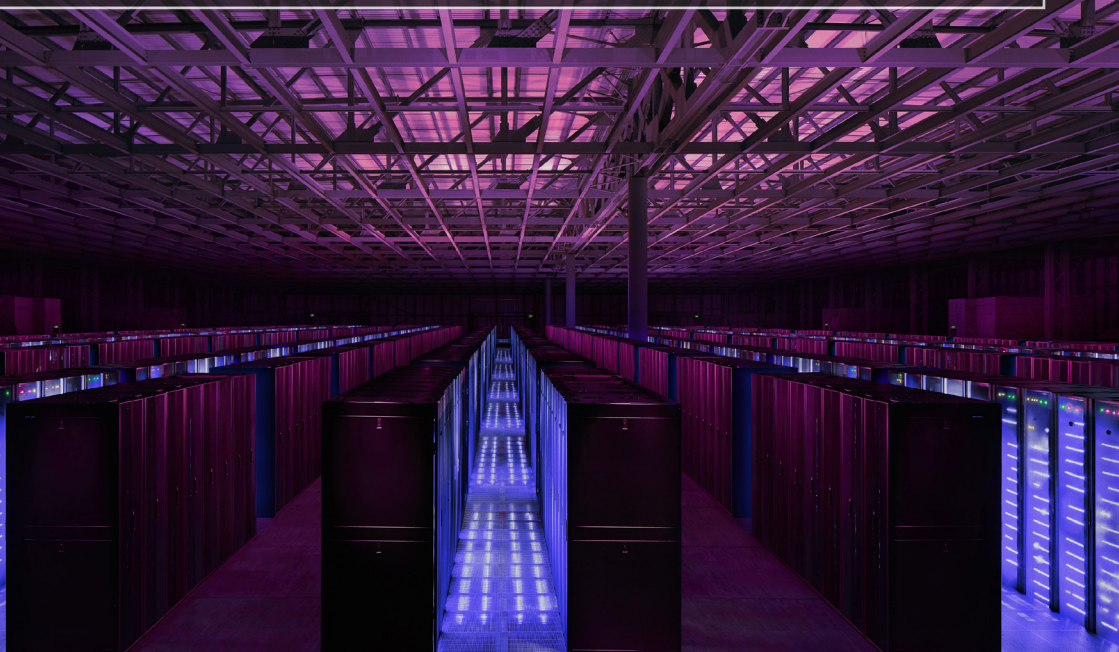
BUYER BEWARE

There are more differentiating factors than immediately meet the eye. Power to space ratio is increasingly critical for achieving highly concentrated power to rack in ever smaller footprints. Growing hyperscale cloud and high performance computing (HPC) deployments are already driving up rack densities to unprecedented levels. While 15-20kW racks have been the norm, we are now seeing densities rise to 40kW, 50kW and even 100kW. This calls into careful consideration a facility's immediate, and forwards, power availability.

Space and levels of mechanical and electrical redundancy are perhaps more obvious areas to look out for but these too vary enormously. So does security. While the latter is a combination of physical barriers, the operational regime and diligence of staff are also inextricably linked.

A key emerging factor in our digital economy has to be levels of connectedness – the best data centres are hyperconnected with a plethora of carrier and gateway options. The worst are isolated sheds with little connectivity.

All of the above directly influence if and how far a business can expand at a site in future.

LOCATION, LOCATION, LOCATION

A suitable location is obviously important but it pays to fully evaluate the environmental risk factors such as proximity to a flood plain, flight path, and terror threat level. Geopolitical factors will also have a huge influence on the 'what ifs' and contingencies at a data centre.

Such factors may prove a step too far when assessing international political and regulatory landscapes, cultural differences, security, latency, equipment installation/de-installation costs, proximity of IT service/repair organisations, travel time and costs in the event of unplanned downtime. Location is also likely to impact on space and service pricing due to cost of real estate and labour. Out of town locations that are free from the risks and constraints of metro locations are on the

'Businesses must decide whether to continue investing in privately owned data centres, or outsource to colocation operators.'

rise and will likely offer lower unit costs.

GRAND DESIGNS

Consider too if data halls come pre-built or custom designed. In the former you have to accept how they've been fitted which offers little flexibility compared to the latter for precisely meeting requirements.

Then there's the operational side of things. Is the operator focused where it counts on excellence in what they do? What about the extent and quality of site facilities and services on offer and track-record of continuous investment in plant and service delivery? There's currently a huge variation in the thoroughness and regularity of relevant testing, planned preventative maintenance and reinvestment – from none at all through to excellent. And be sure to ascertain the actual service record at the site. Have there been failures and why?

Last but not least, the financials. Is the asset being squeezed for a return or approaching end of life on its plant/ fitments? Also check who owns the facility and the land it sits on and how that impacts on what might happen in the future?

PROCURING WITH CONFIDENCE

Many CIOs will have chosen a facility based primarily on cost, only to find midway in their project or tenure, they experience where the corners have been cut. A good way of looking at things is to see the data centre cost in the context of the total IT project cost and in the context of the value of data – here it is often a minor component in overall cost, and yet can have a catastrophic influence on business when things go wrong.

Procuring to a rigid specification is another issue. Let the operator demonstrate how they run their facility instead. Procuring to technical agendas, not business agendas, is important – it

should not be about engineers wanting the closest facility for convenience. So be clear on what the facility has to do for you and be clear on the investment required to do it properly.

CHECK LIST

Here are the key things to consider when making a decision:

• Avoid getting trapped with a provider offering limited forwards flexibility and available space and power. Go and see and touch the space, plant and operations behind the scenes and judge for yourself.

• Not establishing the service record and capacity at site is common. Thoroughly investigate any historical failures for yourself. Ask for a straight written response as to long term history of service continuity and service level agreement (SLA) conformance at the location.

• Don't rely on an SLA alone to deliver sound forwards service. Look instead at how the critical plant has been invested, architected and operated. Meet the people and decide for yourself if they have the right attitude and will be good to work with.

• Investigate the service history at each location and where it's excellent, understand why. Where there have been problems understand why and see that the operator understands why. Also, for the critical metrics in any SLA, walk through and evaluate each operator's level of focus, preparedness, experience and compliance on making sure that metric never fails.

• Don't expect the operator to be able to do it all. It's often more important that a data centre sits in an ecosystem of expert suppliers and industry experts, leaving customers to work with other third parties at site to deliver their projects.

• Don't forget the service wrap when it comes to the management reporting on service, capacity, utilisation, and compliance in a transparent fashion. A good third party operator should give you more control and insights to manage the service than doing it yourself. ■

SIMON BEARNE
Simon Bearne is commercial director at NGD. With a deep knowledge of cloud and colocation services provision, he has a wealth of business experience gained from senior positions at companies such as Claranet, Colt, and Cable & Wireless Communications.

HellermannTyton

HellermannTyton's world leading RapidNet is the perfect pre-terminated solution for the data centre. RapidNet tackles many of the issues faced where data centre infrastructure is concerned, offering reduced installation times, high performance, high capacity solutions, and the flexibility of choice across both copper and optical fibre systems.

RapidNet can reduce installation times by up to 85 per cent, ensuring data centre space can be ready for use or resale quickly, giving the data centre manager a faster investment to revenue stream.

RapidNet offers performance and capacity in both copper and fibre formats with a wide choice for the end user. Using the RapidNet MTP VHD solution, it is possible to achieve up to 576 fibres in 1U of rack space, meeting the capacity demanded by today's data centres.

RapidNet is now available in an 8-fibre option designed to work directly with QSFP+ transceivers, allowing full utilisation of backbone fibres. RapidNet 8 Fibre is ideal for future proofing your data centre and migrating from 10 Gigabit Ethernet to 40/100 Gigabit Ethernet and beyond.

For more product information **CLICK HERE.**
www.htdata.co.uk

Excel Networking Solutions

Excel Networking Solutions' comprehensive range of Environ racks, cabinets and open frames offers exceptional quality – making them suitable for a wide range of applications in the enterprise, data centre, security markets, as well as for every day cabling systems.

The full range, which is available for free next day UK delivery, can be viewed in the dedicated Environ digital catalogue.

Designed specifically for use by facilities where rack space is being used by different clients within a shared facility, and where security is paramount, the Environ Co-Location (CL) Series of racks takes the existing qualities of the Environ range and features secure and lockable compartments with unique keys to ensure optimum protection of a cabling infrastructure.

Excel also offers a pre-configured cabinets and on-site rack assembly service, which is proven to reduce installation cost and time whilst providing a fully tested, fully traceable, 100 per cent inspected product.

CLICK HERE for further details.
www.excel-networking.com

Centiel

CumulusPower from Centiel is the most available and flexible, truly modular uninterruptible power supplies (UPS) on the market. Offering industry leading availability of 99.9999999 per cent and low total cost of ownership, CumulusPower is scalable both vertically and horizontally from 10kW-3.6MW, with a wide range of frame sizes available to hold UPS module ratings of 10kW, 20kW, 25kW, 50kW or 60kW.

The technology is consistent throughout the module ratings, with each module containing the components of an entire UPS including a rectifier, inverter and static switch, all operating online in parallel with each other, making it a truly modular and completely flexible solution.

With the highest level of resilience and no single points of failure, the modules have the ability to be hot-swapped in less than a minute, while the rest of the modules continue to protect the critical load. This increases the level of availability, dramatically enabling zero downtime.

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

EDP Europe

EDP Europe's RackANGEL Co-Lo is a flexible and scalable colocation rack solution for multi-tenant or shared customer environments. Combining bespoke racks with an advanced access control system, biometrics and in-rack CCTV, RackANGEL Co-Lo provides the ultimate managed colocation rack offering.

As standard the RackANGEL Co-Lo cabinets are available with two, three or four compartments, in widths of 600mm or 800mm and heights of 42U, 47U or 50U, depending on the required configuration. Custom built cabinets can be designed to meet your exact requirements without any minimum order quantities or extended lead times.

Each compartment is completely independent with protected cable management, removable side panels that are locked from the inside, vented shelves for better airflow management, and they can be supplied with PDUs and grounding installed. RackANGEL Co-Lo is delivered with IP addresses pre-configured ready for you to plug and play on your network.

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

One giant leap

Louis McGarry of Centiel examines the role of modular uninterruptible power supplies (UPS) in decentralising colocation data centre infrastructure

▶ What do you do when you see a space man? Park the car man! I've always loved that joke! But seriously, what relevance has it got to colocation data centre infrastructure? The fact is that the processing capacity of servers is rapidly increasing – 10 processors used to do the job that one can now do. Moore's Law states computer processing power doubles every two years, yet we also know that the speed at which we create data is growing at an astonishing rate and the situation is only set to escalate.

RESPONSE MECHANISM

Data centres are right to respond to anticipated future demand. However, what also needs to be considered is the equally rapid reduction in IT power consumption. With real estate prices at a premium and set to continue to rise, plus the high costs of power consumption and maintenance of an oversized legacy UPS, maximising the use of existing infrastructures and constantly rightsizing appropriate to the load can minimise running costs and maximise returns for the colocation data centre.

Colocation data centres are generally assessed by customers on their Power Usage Effectiveness (PUE), level of resilience and the cost of space. One option, to optimise all three elements, is to look at deploying a decentralised infrastructure. We are currently seeing around half of the colocation data centres we work with moving in this direction.

WHAT IS IT?

Traditionally, data centres have tended to house oversized critical power infrastructure, in anticipation for future demand. Those that have moved towards a decentralised infrastructure, fence off areas within the facility to create smaller rooms with UPS systems that are dedicated to individual clients. Advances in modular UPS technology have enabled this approach because data centre managers have rightly started to ask, why install 1MW of UPS from day one when you haven't sold the space?

Installing the full equipment from day one – and paying the capital upfront – often means we see facilities that have never grown to their full potential, resulting in everything being oversized. For example, I often see UPS systems designed to run at N+1 that in reality are running at N+3 and sometimes N+4. This happens when the actual load is far less than what

Pay as you grow options enable close control of costs. It means colocation data centres can scale as they sell the space, which offsets the purchase price of new UPS modules.

TRULY MODULAR

Optimising this approach is easy with a truly modular UPS, as several individual UPS modules are contained within a frame. All the individual modules are effectively UPSs in their own right, all containing a rectifier, inverter, and static switch and all operating online in parallel with each other. For example, eight 20kW UPS modules may typically be contained within a single frame, offering a resilient configuration of 140KWs N+1.

With a modular system, where the static switch is included in each module, the rest of the modules in the UPS frame continue to protect the load until it can be replaced. A loss of resilience in an isolated area of the data centre is easier to address than with a standalone UPS, where any sort of repair leaves the system vulnerable. If required, it takes around 30 seconds to hot-swap a module while the rest of the modules continue to protect the critical load.

At no point does the system need to be transferred to maintenance bypass, which puts the load at risk. This increases the level of availability dramatically. In this way, modular UPS offer the highest level of resilience in the market, as with no single points of failure availability is maximised and clients remain protected.

IT GETS BETTER

There are further advantages, as the assets or modules from a modular UPS can also be moved around for reuse within the

was anticipated.

Keeping many UPS 'awake' is a significant financial burden, not to mention its environmental impact. I believe there is a case to make for education here when it comes to rightsizing and the general management of equipment using pay as you grow options. Reusing, rethinking, resizing and remanaging existing infrastructure could enable data centre owners to utilise existing equipment, reducing waste and overall expenditure.

infrastructure. If one client moves on and another arrives and the module ratings are standardised – for example, all 20kW – then they can simply be reused elsewhere. Also, if a client is looking to expand by 3kW it's far more cost effective to add a 20kW module than another 50kW one. Considering module standardisation as part of capacity planning could enable

area of the data centre depending on requirements. This client centred approach means a flexible product and range of pricing which can appeal to a broader range of customers.

LEVEL BEST

In order for Tier 4 data centres to achieve the required high levels of availability, they

data centre managers to determine the appropriate module rating for the average load step.

A decentralised approach that takes advantage of a modular UPS also offers flexibility, so the resilience level can be tailored to the client's needs and budget. Any tier rating can be achieved in any

attempt to remove all single points of power failure by duplicating UPS systems (2N) and by adding parallel redundancy into each UPS (2N+1).

The problem is that such duplication causes the UPS to be operated at a low point on their efficiency curve, and hence adversely affect the data centre's

PUE. The most modern, modular UPS, if correctly configured, are able to combine the benefits of high availability with very high efficiency even at low loads because they operate at a lower point on their efficiency curve, and therefore offer a very low data centre PUE.

In this way, by selecting a modular UPS and a decentralised infrastructure proper utilisation of the UPS and fine edge of efficiency can be achieved. If a client moves on and chooses a different avenue to protect its data, it's easy to ramp down, reallocate the asset or isolate the space.

However, a decentralised approach requires input from experienced engineers who really know how much energy a server rack burns, suppliers with flexible product solutions and end users and designers who understand the future requirements. Creating a community of experts at the project's feasibility stage could play a significant role in right sizing and optimising the cost versus resilience of a UPS.

THE FINAL FRONTIER

Advancement of knowledge, connected thinking at the design stage, and aiming to achieve the best use of infrastructure, will reduce costs and optimise profits for the colocation data centre. So next time you see a space man, don't just park the car (man) because you can think about how it may be best utilised! Borrowed from the words of one great spaceman – it may be one small step

'A decentralised approach that takes advantage of a modular UPS also offers flexibility, so the resilience level can be tailored to the client's needs and budget.'

for man, but one giant leap for data centre kind. ∎

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LOUIS McGARRY

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

Ryanair chooses Vodafone Business to transform its digital infrastructure

Ryanair has chosen Vodafone Business as its technology communications partner in Europe. The new seven year agreement builds on an existing relationship and focuses on the experience of Ryanair's customers in reaching their destinations on time.

Under the agreement, Vodafone Business will transform Ryanair's ICT infrastructure using every part of Vodafone Business' solutions – including cloud, unified communications, software defined wide area network (SD-WAN), internet of things (IoT) and security services.

Vodafone Business will support 300 Ryanair sites and some 153 million passengers across 40 countries, meaning that up to 95 percent of Ryanair's telecoms will be managed directly by Vodafone Business. This includes the hosting of its core infrastructure that maintains Ryanair's core business processes from online booking, passenger boarding and in-flight transactions, to training centres, offices and data centres.

Sudlows is appointed to NEUPC Framework

Sudlows has been appointed to the North Eastern Universities Purchasing Consortium (NEUPC) Framework for the provision of data centre management equipment and infrastructure.

NEUPC is one of six UK higher education purchasing consortia established to deliver and manage a wide range of collaborative framework agreements designed to maximise third party expenditure within the higher education sector. This new three year framework will enable Sudlows to offer its renowned design and build technical services for data centre project work across all of the UK's universities.

Sudlows has a long successful record on delivering critical infrastructure projects for higher education institutions across the UK including The University of Central Lancashire, Manchester University, The University of Portsmouth and SOAS University of London.

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European Fisheries Control Agency awards contract to Unisys for IT services

The European Fisheries Control Agency (EFCA) is partnering with Unisys for a range of secure IT services. EFCA is a European Union (EU) agency headquartered in Vigo, Spain, and assists EU member states in complying with the rules of the Common Fisheries Policy (CFP).

EFCA's work is critical in maintaining a pan-European level playing field for the fishing industry, and toward sustainable fisheries by enhancing compliance with existing conservation and management measures through coordination of fisheries control activities and the provision of assistance to member states and the European Commission. It also provides support to the European Border and Coast Guard Agency and the European Maritime Safety Agency.

Under the terms of the agreement Unisys will provide services in support of EFCA's operational information systems and secure access to the tools needed for coordination and cooperation among national control and inspection activities.

PROJECTS & CONTRACTS IN BRIEF

Megaport has announced the expansion of its services to Japan. Cloud connectivity services are now available in Tokyo, through multiple data centres including Equinix TY2, TY4 and AT TOKYO CC1.

Cohesity has implemented a comprehensive data back-up solution for the University of Lausanne in Switzerland. Working with Infoniqa, the solution is significantly faster and more automated and scalable than systems previously used.

RTB House has selected the maincubes Amsterdam AMS01 data centre to colocate its Open Compute Project (OCP) hardware.

The UK's most advanced internet of things network, IoT Scotland, is now well established in Scotland, with Glasgow and Edinburgh at almost 100 per cent coverage.

Caroll, a Vivarte company, has selected GTT to operate its wide area network in Europe. GTT connects Caroll's French headquarters with its 173 stores in Andorra, Belgium, Germany, Italy, Luxembourg, Monaco, Portugal, Spain and Switzerland.

Leviton

Leviton's Cone of Silence suppresses alien crosstalk (AXT), avoiding data transmission issues such as reduced data rates, poor communication, loss of communication and eventual degradation of overall network performance. By reducing AXT, the Cone of Silence ensures high performance and system longevity.

The patented Cone of Silence is an injection moulded cover for the Leviton eXtreme Category 6A jack. One Cone of Silence is included with each eXtreme Cat 6A Jack. In addition to the Cone of Silence, these jacks feature an innovative cutting ledge and pair separation towers, which simplify punchdown, reduce rework and support faster termination.

CLICK HERE to learn more.
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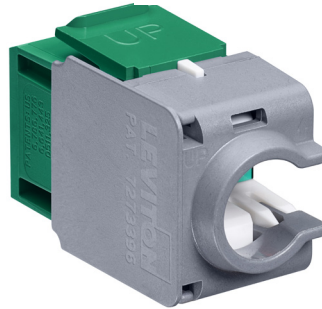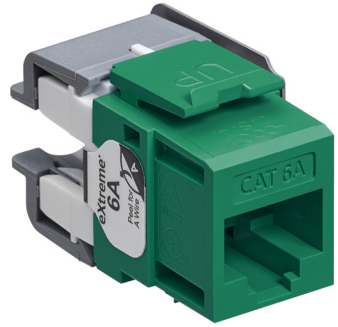
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Siemon

Unplanned data centre downtime can cost a business thousands of dollars and whilst power outages and network failures range amongst the most common causes, industry reports show that downtime is often attributed to human error.

Siemon's new V-Lock cabinet door security system provides superior cabinet level access control for improved security, administration and control in mission critical colocation and enterprise data centres. V-Lock comprises a comprehensive and easy to set-up hardware and software system, and a wide range of secure door handles to meet specific cabinet security needs including electronic, low frequency card, high frequency card, biometric fingerprint and PIN access.

The solution uses a server based software platform to administer users, their cards and biometrics and to manage user and group permissions. It also provides real time monitoring and maintains extensive logs of events for auditing and compliance regulations.

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Picture of health

Tim Carter of Equinix looks at how digital transformation has the power to save lives and the role data centres will play in next generation healthcare

▶ As people become increasingly accustomed to services being accessible and on-demand, healthcare companies are under pressure to innovate new ways to deliver care. Technologies such as the internet of things (IoT), big data and advanced analytics have turned traditional healthcare into 'smart healthcare', connecting people and businesses to help save lives through the use of mobile and electronic technology. These new apps are paving the way for better diagnosis of disease and the improved treatment of patients.

TREND SETTING

Even organisations outside of the healthcare realm are capitalising on the rising trend of technology in this sector, by introducing their own solutions. In October 2019, for example, Facebook announced the launch of a new feature to help track and advise on preventive health screenings for users, depending on characteristics such as age and sex. Like similar initiatives, this has the aim of facilitating the identification and treatment of health problems, before they have the potential to

escalate into something more sinister.

As the benefits of these investments become evident, the demand for more digital services only increases – and this is unlikely to halt with the promise of a 5G network on the horizon, and the rapid advancements it promises. It was reported just last year that a surgeon in China performed the world's first remote operation using 5G technology, achieved thanks to a lag in latency of only 0.1 seconds.

The explosion in data that comes along with all these new technologies is creating new pressures and opportunities, forcing businesses to store and process data in

new and scalable ways to allow for real time analysis. So, what does this time of digital transformation mean for these developments taking place in the healthcare sector, and how can enterprises ensure they keep their competitive business advantage?

PERSONALISED INSIGHT

According to Frost & Sullivan's Social Innovation in Healthcare report, the next generation of wearable devices and healthcare-centric apps have the potential to reach $25bn globally by 2020. This alone shows how businesses are increasingly realising the importance of investing in these new technologies. And, with an ageing population, the implementation of smart technology is a major market for businesses operating in the health sector, offering solutions that are both cost effective and improve quality of care.

For instance, technologies such as wearable devices and sensors can help less-able people, such as those suffering from Alzheimer's disease, continue to live at home. This is achieved by having sensors placed around their home, which detect movement and send notifications if the person has missed a meal or taken a fall, for example.

ON REPORT

Results from Equinix's recently announced annual market report – the Global Interconnection Index Volume 3 (GXI Vol 3) – illustrates the impact of these new technologies on the UK's healthcare infrastructure. It predicts the private exchange of data within the healthcare and life sciences sector will grow by 71 per cent in Europe by 2022.

This reflects the data surge brought by these new apps and services, with information being communicated to multiple devices simultaneously. The ability to do this is even more critical in this industry than in any other, as even a slight delay in data transfer can be fatal to a patient's life. Delivering accurate insights in as close to real time as possible, should therefore be at the forefront of business' goals. With data surrounding health also being extremely personal and sensitive, ensuring its privacy and security is vital.

This is why colocation data centre companies aim to position themselves near to big cities, where the amount of data being stored and processed is at its highest. In this way, by being close to the digital edge they are able to ensure data is being communicated as swiftly, efficiently and securely as possible, as well as handle the huge rise in data traffic in this constantly growing digital era. So, for healthcare businesses to have the capacity

'For healthcare businesses to have the capacity to compete in this expanding sphere of digital healthcare, they must be prepared to rearchitect their IT infrastructures to cope with the ultimate increased levels of data traffic.'

to compete in this expanding sphere of digital healthcare, they must be prepared to rearchitect their IT infrastructures to cope with the ultimate increased levels of data traffic. And one way they can do this is with the help of partnerships.

THE POWER OF PARTNERSHIPS

Alongside its GXI Vol 3, Equinix recently commissioned an independent survey exploring the views of more than 2,450
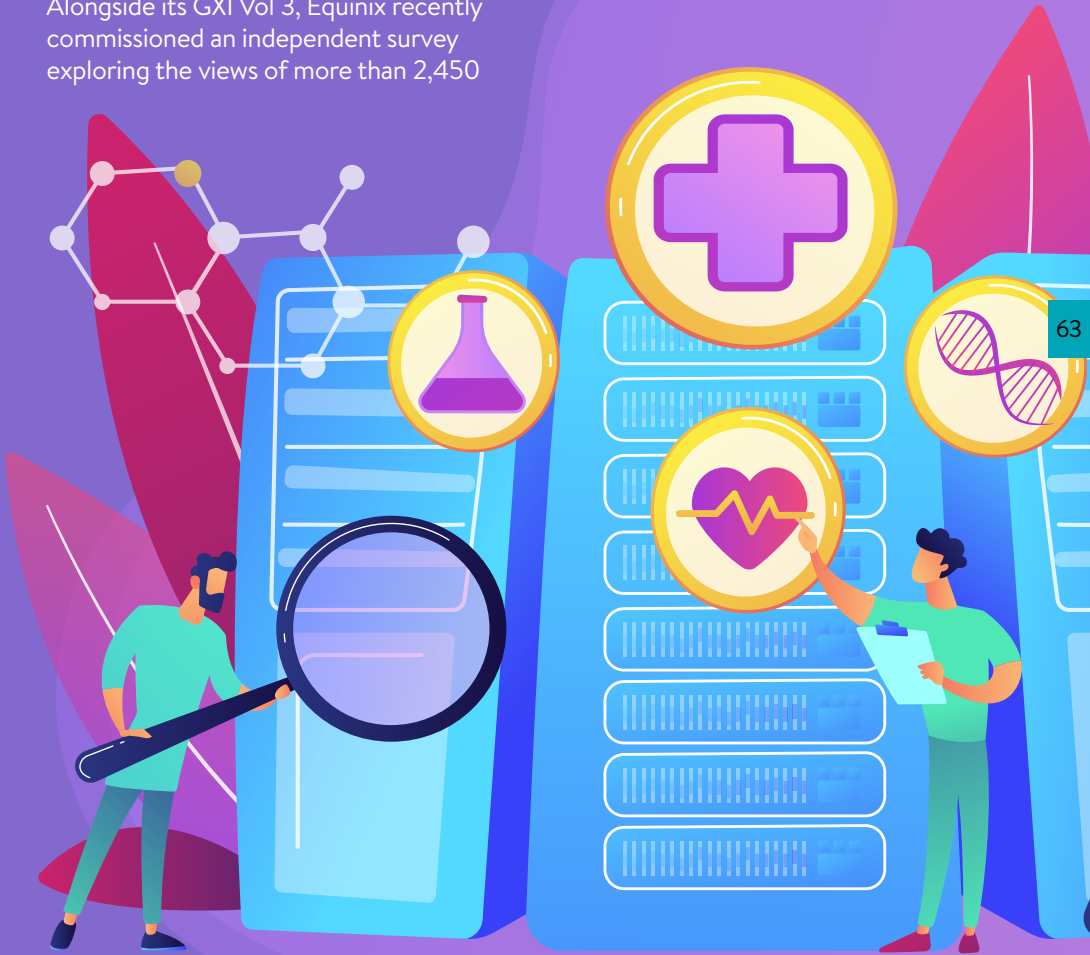
IT decision makers globally. The results revealed 40 per cent of respondents in EMEA see interconnection as a key facilitator of digital transformation.

So, for healthcare organisations to be able to continue providing innovative healthcare solutions to address new and changing demands, they should be increasingly partnering beyond their sector. By engaging in real time, secure communications and data exchange with a whole host of business partners, health ecosystems, network and cloud providers, as well as patients themselves, businesses can work to improve patient care with the use of extensive digital tools. With cloud and analytics providers, for example, healthcare organisations acquire the ability to collect and store massive amounts of data, which can then be analysed to provide insightful results that significantly impact the level of care patients receive.

For these providers to be able to work together to deliver this, they need to be able to connect in a secure and effective way. Data centre providers can help businesses to create a robust and secure digital network, that allow them to analyse and process data securely and efficiently.

Equinix's survey also identified that 27 per cent of IT decision makers think the healthcare sector is one that will benefit the most from interconnection over the next five years. Google, for instance, has reported the development of algorithms to identify cancerous tumours on mammograms, and we are now hearing of cloud assisted medical collaboration leading to new drugs or treatments. It is these advancements that further highlight the growing need for businesses to invest in rearchitecting their companies' digital

infrastructure, ensuring they can continue to deliver new and innovative healthcare solutions.

HEART OF THE MATTER

In order to take advantage of the exciting opportunities brought about by the invention of new technologies, traditional IT models must be pushed aside in favour of more robust, secure and scalable IT infrastructure, based on colocation and interconnection. By employing the power of interconnection, health organisations can facilitate the adoption of digital technologies, integrate health ecosystems, and directly and securely connect an ever-growing distributed global mix of employees, partners and customers. It is this rapid move to a more digital world that is inevitably enforcing the need for businesses to evolve and invest in pioneering IT strategies, to deliver the healthcare experience now being demanded. ■

TIM CARTER
Tim Carter leads the connected health sector at Equinix.

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