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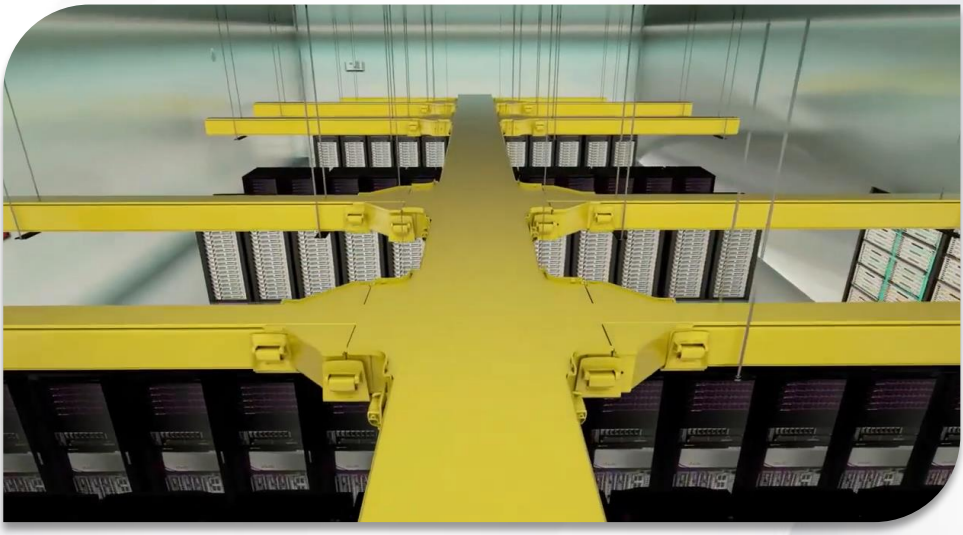

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Time to chill out

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Not only does a data centre cooling system account for a significant amount of a facility's overall energy consumption, it also plays a vital role in ensuring uptime through optimal equipment operation. Therefore, getting a cooling strategy right first time is imperative – but often easier said than done.

Configuring the right solution presents a complex engineering challenge and, as such, there are some significant pitfalls. To compound the issue, the range of cooling options for data centres is diverse, with many new technologies such as liquid cooling allowing owners and managers to experiment with new methods for solving their climate control challenges. To offer some clarity on the subject, in this month's Question Time a panel of industry experts examines the common mistakes made when implementing climate management systems and how to avoid them.

On to buildings of a different kind and the rise of intelligent buildings continues unabated and their ability to utilise network infrastructures in interesting and innovative ways is often inspirational. This issue has two excellent articles on this subject and in the first R&M's Matthias Gerber takes a closer look at some of the key developments that are proving essential for next generation intelligent buildings, while Rob Kelly of Sudlows goes on to explain the need for in building audiovisual systems to respond to changes in working practices.

The importance of testing and test equipment should never be underestimated and Daniel Klimke of NetAlly takes a look at the various types of test equipment currently available, explains what they do and how to select the right one for your requirements. Dan Barrera of Trend Networks then explains what to look for when evaluating cloud software solutions for handheld testers.

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

Rob Shepherd
Editor

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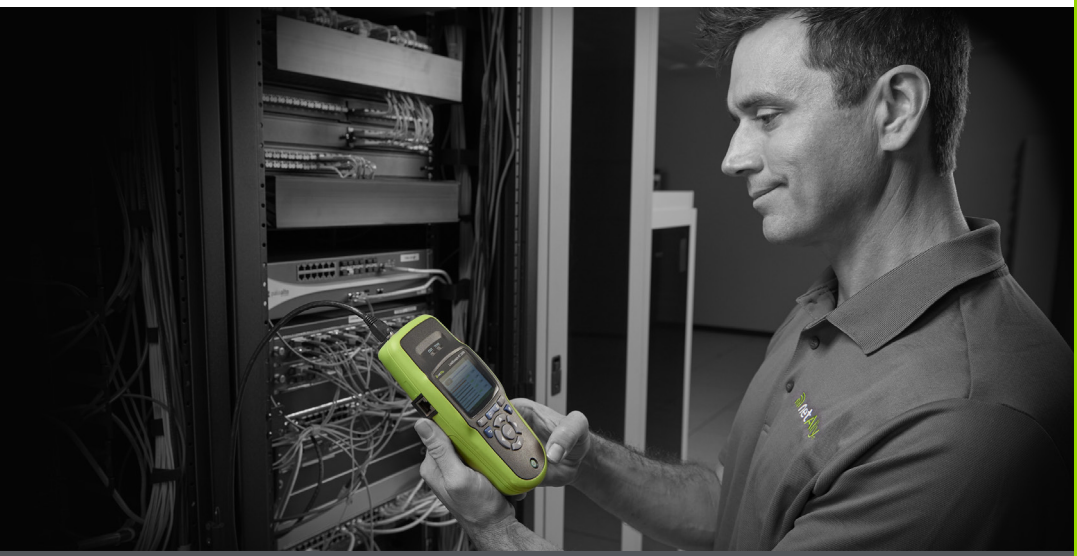

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46 per cent of bosses plan to hire new tech staff in 2022


Ritam Gandhi

Digital transformation is a key focus for UK businesses in the coming 12 months, research from Studio Graphene has revealed. It commissioned a survey of 752 senior decision makers and found that the majority are looking to funnel investment into new technology projects in 2022.

44 per cent of those polled admit that the cost of development has impeded them from upgrading their technology over the past 12 months, while 49 per cent say a poor experience with new technology has discouraged them from investing in other projects. Looking to the future, 50 per cent envisage trialling new technologies to be a top strategic priority and 51 per cent say their firm intends to launch new digital projects, tools or initiatives next year. Many are upping their recruitment efforts to support these plans, with 46 per cent of all businesses saying they are also looking to hire new IT staff.

Ritam Gandhi, founder and director of Studio Graphene, said, 'It's telling that almost half of companies are seeking to hire more IT professionals – unfortunately, given the digital skills shortage, this might prove an issue for many.'

IT businesses are spending 3,336 hours interviewing graduate candidates per year


Becs Roycroft

According research from mthree, 53 per cent of IT companies have interviews with prospective graduate employees comprising more than one stage, and 60 per cent said interviews for junior roles are conducted by senior executives. Additionally, 56 per cent revealed that prospective employees are interviewed by more than one existing member of staff.

Businesses are typically interviewing multiple candidates for each graduate position, with the average number being six for just one role. However, in 44 per cent of businesses, seven or more candidates are interviewed for every one role available, and this figure rises to at least 10 for 24 per cent of UK IT firms.

Becs Roycroft, senior director at mthree, commented, 'Many businesses are now looking to grow their workforces. However, in addition to upfront recruitment costs such as recruitment agency fees and job advert expenses, it's important for businesses to keep track of the time and cost of the interview process.'

Vertiv sees edge component of total compute growing by 29 per cent

Investment in edge computing will change the profile of the data centre over the next four years, increasing the edge component of total compute by 29 per cent over that time. The industry's ongoing shift to the edge is among the notable findings from a survey of data centre industry professionals from Vertiv.

34 per cent of those surveyed are either planning or in the midst of significant edge deployments. A quarter have already deployed new, purpose built edge sites, and 41 per cent are operating legacy edge sites. Survey participants also anticipate a 150 per cent increase in core sites and increased activity in the cloud. The percentage of IT resources deployed in the public cloud is expected to grow from 19 per cent currently to 25 per cent by 2026.

'The next five years will reshape the data centre landscape, shifting more and more computing to the edge, while buttressing the enterprise facilities at the core of modern hybrid networks,' said Martin Olsen, global vice president for edge strategy and transformation at Vertiv. 'The future of computing is about speed and latency, and the only way to meet the need is to build out the edge of the network.'

Equinix launches Network Edge in five new European countries

Equinix has expanded its Network Edge services into France, Finland, Ireland, Italy and Sweden. Already deployed in the UK, Netherlands, Germany and Spain, Network Edge enables any company to establish a presence where they don't have an existing footprint, as well as process data closer to the user without the need for a physical deployment in a data centre.

The coronavirus pandemic has placed greater emphasis on the need to put data closer to the user as businesses and workers across the globe adapt to a hybrid working environment. Deploying a traditional hardware-centric geographic presence is time consuming and expensive, with many businesses already re-evaluating their traditional office deployments.

Russell Poole, managing director UK at Equinix, said, 'By expanding the reach of Network Edge into these new markets, we are allowing businesses to establish themselves in more metros without the need to physically deploy hardware in a data centre. Through unrivalled access to new markets, enterprises can unlock new revenue streams and compete in some of the world's most digitally advanced and important business hubs.'

BCS launches its 2022 apprenticeship programme

Business Critical Solutions (BCS) has started recruiting for this year's apprenticeship programme. This is the fourth year of the programme, which is run in partnership with Southbank University and part of the company's commitment to helping to tackle the skills shortage in the engineering and data centre sector.

BCS will be on the lookout for future data centre professionals and leaders, and is hoping yet again to attract top candidates. The programme this year has been extended to include the BSc (Hons) Construction Project Management. BCS also continues to offer the BSc (Hons) Quantity Surveying course.

Chris Coward, head of project management at BCS, said, 'We are delighted to continue and extend our partnership with Southbank University and are excited to launch this new opportunity with the new BSc (Hons) Construction Project Management course. The skills shortage in the industry is still very real and this new opportunity goes some way to plugging the gap.'

ECS updates scheme for greater recognition of digital skills

The Electrotechnical Certification Scheme (ECS) has introduced a new CPD recording system and artificial intelligence based monitoring software to allow ECS health and safety assessments to be taken remotely, saving travel time and cost.

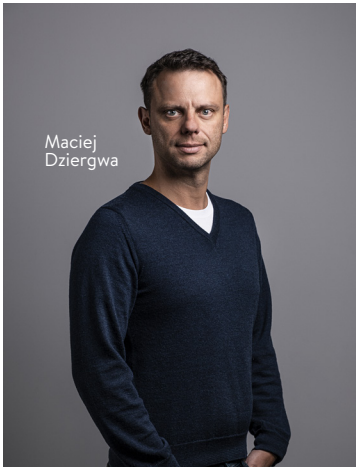
It has also worked to update a number of apprenticeship and occupation requirements, and expanded the ECS to recognise a greater number of training and qualifications. This includes the development of digital support cards including Digital Support Technician and Operative, Network Security Technician, Digital Network Engineer and Digital Support Manager. These cover areas such as digital communications, network systems, data centre operations and management, network and cybersecurity, programming, software, support and user skills.

Andrew Stevens, president and CEO at CNet Training, commented, 'ECS is essential to provide confidence and confirmation of an individual's certified skills. The new digital support cards demonstrate a great progression for ECS and we welcome the endorsement from them by recognising successful completion of CNet Training's technical education programs as eligibility towards gaining the cards.'

20 per cent of CTOs have reached their position in less than five years

STX Next has found that a fifth of chief technology officers (CTOs) reached the position in fewer than five years. A further 35 per cent of respondents revealed that it took 5-10 years to become CTO, while only 27 per cent took 11-15 years. The results highlight the speed at which a CTO position can be reached, and proves it is a viable career path for aspiring tech professionals.

Maciej Dziergwa, CEO at STX Next, said, 'With a strong work ethic, the right blend of technical and soft skills and enough on the job experience, it's realistic to reach the CTO position in just a few years. However, there is work to be done in improving the role for the future. Organisational leaders should look at ways to support their CTOs even further, be it through better salaries, placing greater trust in them to make major decisions, or supporting them with the right personnel to reach their goals.'


Maciej Dziergwa

NEWS IN BRIEF

Data presented by Finbold indicates that Amazon Web Services (AWS) accounts for the largest share of cloud infrastructure service providers at 33 per cent. Microsoft's Azure platform ranks second with a share of 21 per cent, followed by Google Cloud at 10 per cent.

TalkTalk has claimed that the switch to full fibre over copper networks will result in an 80 per cent improvement in energy efficiency.

A study from Juniper Research has found that the global value of the cellular internet of things (IoT) market will reach $61bn by 2026, rising from $31bn in 2022.

World Wide Technology (WWT) has uncovered the top sectors for 5G investment, with cloud computing identified as the top category.

Uptime Institute has launched its new Standardized, Comprehensive Infrastructure Risk Assessment for Financial Sector Institutions (SCIRA-FSI). SCIRA-FSI assesses critical IT environments across enterprise data centres, multi-tenant data centres, and public and private clouds, to identify and mitigate physical and operational outage risks.

Colt Technology Services has appointed Catherine Leaver as its new chief people officer. The company has also been positioned as a visionary in the Gartner 2022 Magic Quadrant for Network Services Global.

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The alignment of data a

Hi Rob

The coronavirus pandemic was a catalyst for accelerated digitalisation. Thankfully, most of the technology needed during the crisis was already in existence, supported by data centre and telecoms infrastructure. But what is most significant is that this change is likely to be irreversible – the increased reliance on data centres is here to stay.

However, a decades long efficiency drive, which held data centres to steady demand levels, while processing much more data, has run out of headroom. Our economy and society have gone full throttle on data, exactly at the time when we need to put the brakes on energy consumption if we're to combat climate change. As we demand and produce more and more data, energy consumption levels will rise. How can the industry achieve seemingly contrasting objectives and ramp-up while ramping down?

As if this conundrum was not enough, now throw in the fact that electrification is sweeping other sectors, along with domestic and commercial heating/cooling and electric vehicle charging. As the demand for electrical energy is set to soar, data centre operators will face tough challenges in accessing scarce, new energy production.

The solution is to ramp-up renewable energy production, not only to meet new demand but to also displace current fossil based production. Until now, players in the data centre sector have grown used to getting power whenever they need it. However, as the plates spin across many sources of demand for energy, data's role will be scrutinised in detail. No doubt governments setting the rules and direction for energy markets will be asked to make highly consequential decisions about how energy is produced, managed and who is prioritised for power consumption.

The challenge for data centres will no longer be one of efficiency, but one of sustainability. New metrics and new approaches to data centre design and

and power

operations will fall under greater scrutiny, as will the energy consumed by the overall telecom infrastructure.

We rely on data, data relies on power, and a significant gap between our wants and needs will soon emerge. But this will be the kind of gap that will attract serious investment and innovation. For the grid, this gap will enable new and existing private ventures to build out the renewable power we desperately need.

A seller's market for power supply opens the door to new approaches and new models. For data centres, it will solidify the economic case for a new relationship with power, not just as consumers but as sites that support the grid with energy services, storage and even power generation.

Data and power will realign and, soon in some cases, that alignment will become a physical proximity too. With economics and policy beginning to align in this manner, there is a case for data centres to move into direct flexible supply to the grid. Sector coupling could therefore become one of 2022's major headlines for the data centre sector.

We are seeing the first glimmers of what this might look like. By the end of 2022 and beyond the dots between data and power will truly have been redrawn and hopefully look joined-up, and we will continue to see the growth of ventures structured to make data centres part of the solution to the renewable transition.

Ciarán Forde
Eaton

Editor's comment

The demand for data and pressure to become more energy efficient is a double whammy that data centre owners, managers and users need to address seriously. As Ciarán suggests, 2022 is set to be a pivotal year for this issue and the data centre sector needs to play a positive role in addressing climate change.

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No margin for error

The best method of cooling data centres continues to be the subject of much debate. Inside_Networks has assembled a panel of industry experts to examine the common mistakes made when implementing climate management systems and how to avoid them

Data centres are rapidly increasing in density, so cooling has become a significant consideration. Effective climate control is necessary for optimal equipment operation and uptime, and there are many types of cooling systems currently available, each suited to different applications.

Getting a cooling strategy right first time not only has implications for uptime, but also for the amount of power consumed. It presents a complex engineering challenge and, as such, there are some significant pitfalls. For example, many data centres are overcooled due to poor design, room layout and airflow management. This can lead to a number of issues including bypass airflow, latent cooling, short cycling and hotspots. With many new technologies such as liquid cooling, immersion cooling and direct to chip cooling now available, data centres are starting to experiment with innovative methods for solving their climate control challenges.

To help offer some clarity on this important subject, Inside_Networks has assembled a panel of experts to identify the biggest mistakes that are made, their consequences and how could they be avoided.

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

DAVID CRAIG
CEO AT ICEOTOPE

The biggest mistake is thinking the next 10 years will be anything like the last 10! For the last decade we have had relatively benign technology requirements without the challenges of rapid scale-up of processing capacity. We've also had relatively stable thermal solutions over this period and it's allowed the industry to focus much of its innovation around the most widely available technology – air cooling. However, it is now reaching the limits of what it can do.

Over the years designers have relied upon air cooled servers. As air cooling approaches the limit of its capability to effectively cool ever denser processor cores on the latest server platforms, coupled with the fact that it is not energy efficient and doesn't make the best use of valuable white space, means a change is coming.

The industry is starting to consider liquid cooling as the way forward. It enables, for example, server halls to be designed with greater flexibility, removing the dead space associated with air cooling. As well as the reduction in floorspace because of ever denser racks, ceiling heights can be reduced or taller cabinets installed, as there is no return air requirement. This maximises the effective space.

Replacing mechanical air cooling equipment with liquid cooling will reduce capital and operational expenditure. Additionally, it will increase the uptime and reliability of servers and storage devices by removing vibration defects and the risk of airborne contaminants.

By contrast, in the design of edge data centres organisations must recognise the superiority of liquid cooling techniques over air cooling. Where the application is implicitly focused on the maximisation of space utilisation, energy efficiency, silent and reliable operations, and physical security, there is no place for air cooling.

There's an old saying that if you keep on doing what you're doing, you'll keep on getting what you get. The technologies that have brought us this far will not meet the energy, sustainability, processing power and scalability challenges the next 10 years present. It is time for a paradigm shift in the way we address cooling data centres of all shapes, sizes and locations. Chassis level liquid cooling represents the way forward.

'IT IS TIME FOR A PARADIGM SHIFT IN THE WAY WE ADDRESS COOLING DATA CENTRES OF ALL SHAPES, SIZES AND LOCATIONS. CHASSIS LEVEL LIQUID COOLING REPRESENTS THE WAY FORWARD.'

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IAN BITTERLIN

CONSULTING ENGINEER & FORMER VISITING PROFESSOR AT LEEDS UNIVERSITY

Many mistakes are not discovered in normal partial load service, but mistakes they remain. The client pays for an 'X'MW load, but the cooling system can only remove 90 per cent of the heat. An average data centre load rarely reaches 70 per cent – so a 10 per cent shortfall in peak capacity is not going to impact the user. However, some issues are exposed in due diligence audits and cause contractual problems.

There are seven deadly sins:

- Cooling system capacity matches the ICT load. Ignoring the other heat sources in the room – cables, switchgear, static transfer switches, isolation transformers, busduct and tap-off boxes, lighting and solar gain – means that a 10 per cent extra load is not unknown.

- Pushing the cold aisle temperature to the extreme and not telling the client what happens in the transition time between utility failure and diesel generation operation. For example, the recommended 27°C exceeded on utility failure by a chilled water system might take one minute to regain capacity. Not a problem if the client knows and accepts it, but a big problem if they have an service level agreement within ASHRAE recommended parameters.

- Ignoring climate change. Using the 0.4 per cent ASHRAE 20 year ambient extreme instead of the record temperature. In one example a designer used 102°F ASHRAE but ignored the 115°F record. Is it OK for a customer not to be aware that they will have a cooling capacity failure for a few hours every year?

- Overestimating the Delta-T. A high Delta-T (temperature) across the inlet/outlet increases cooling plant capacity. If the actual Delta-T is lower, the system will be partially rated. Always ask what the Delta-T is in the declared kW capacity, for example, 100kW at 8°C becomes 120kW at 15°C.

- Humidity control. ASHRAE has relaxed humidity control, not withdrawn it.

- No fresh air make-up system. A common way of avoiding cost and improving Power Usage Effectiveness (PUE).

- Not being able to load test the cooling system with the extreme external weather conditions. All UK systems work well in January!

These, and more, can be avoided by employing experienced design engineers on the client side.

'MANY MISTAKES ARE NOT DISCOVERED IN NORMAL PARTIAL LOAD SERVICE, BUT MISTAKES THEY REMAIN.'

ANDREW WREFORD
IT PRODUCT MANAGER AT RITTAL

It's not how much air you blow, or the most intelligent cooling system that survives, it is the one that is the most adaptable to change. The key challenge when designing cooling is providing enough flexibility in the design to allow for future adaptation.

There is an assumption that IT cooling demand is static and once it is deployed just creates heat. IT cooling load continually changes throughout the day when system resources are required. This means a cooling design must solve two key problems – providing cooling capacity to allow the heat load to flex on an hourly basis, and providing IT cooling capacity to allow for future IT expansion. The short-term and long-term cooling design will have a major impact on the ability of a data centre's future IT deployment and overall energy efficiency.

For the long-term design, it is essential to know the maximum cooling capacity a facility will need. This will allow a designer to select appropriate cooling systems that enable capacity to grow as the IT load increases. This is important for energy efficiency because the optimum efficiency is provided when the cooling supply aligns with the IT cooling demand. Any oversupply will create inefficiency and increase overall data centre energy costs. This means that in the initial piping design additional tap-off points may be required to allow future cooling units to be installed without interrupting the live data centre environment.

In the short-term, the selected cooling system must have enough flexibility to react to the dynamic IT load. This means incorporating electronically commutated fans that regulate their speed and control valves to allow chilled water to be adjusted according to the IT demand. Even the cooling medium changes the cooling unit's ability to adapt to the dynamic IT load. Direct expansion (DX) based cooling can react faster to a dynamic load, however, it's typically constrained to smaller capacity. Water cooling, on the other hand, reacts slower to IT load changes but provides a higher cooling capacity than DX.

Darwin quotes that the key to survival is the ability to adapt to change, and his theory is applicable to data centre cooling design.

'IT'S NOT HOW MUCH AIR YOU BLOW, OR THE MOST INTELLIGENT COOLING SYSTEM THAT SURVIVES, IT IS THE ONE THAT IS THE MOST ADAPTABLE TO CHANGE. THE KEY CHALLENGE WHEN DESIGNING COOLING IS PROVIDING ENOUGH FLEXIBILITY IN THE DESIGN TO ALLOW FOR FUTURE ADAPTATION.'

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STU REDSHAW

CHIEF TECHNOLOGY AND INNOVATION OFFICER AT EKKOSENSE

At the design stage, engineering teams often have a figure in mind that's going to be the operational or maximum load. It might be a 2MW or a 5MW site, but that number quickly becomes a curse because the reality is that data centres rarely run at that level.

That's why design teams need to think about part load operation from an early stage and build it into their designs. There are several cooling initiatives that can be applied here around modularity and containment – with the ability to turn things on and off to mothball parts of the data centre that aren't currently needed. However, it's important to have a telemetry system that can give you visibility and helps you to optimise for part load operation.

Design teams need to address the challenge of loading out, or getting a data centre started on its journey towards its mythical steady stay load – which may or may not exist. Many find it difficult to get a data centre up and running without turning everything on, and that clearly incurs significant costs and energy wastage.

Finally, data centre planners must recognise that at some stage they are likely to face the inevitable request to go over maximum load. This shouldn't come as a surprise, particularly if they have already made plans at the design stage – whether that's putting additional ducting in a current facility or having enough land accessible for a future expansion. Thinking about these operational requirements at the design stage and knowing whether plans could accommodate an additional 25 per cent, 50 per cent or even 100 per cent of current load capacity should ideally be part of the initial design brief.

These decisions also become much harder without true real time visibility of existing data centre loads and cooling performance. How can you be sure of your current capacity? Can you be certain that you're within 10 per cent of your maximum design load and need to trigger an expansion? You're going to need answers to these questions to trust your initial cooling and climate management plans.

'DESIGN TEAMS NEED TO ADDRESS THE CHALLENGE OF LOADING OUT, OR GETTING A DATA CENTRE STARTED ON ITS JOURNEY TOWARDS ITS MYTHICAL STEADY STAY LOAD – WHICH MAY OR MAY NOT EXIST.'

SIMON GALLETTI

SALES TEAM LEADER THERMAL AT VERTIV

Over recent years the requirements for data centre cooling and thermal management systems have evolved. These changes can throw up unexpected challenges during the design and implementation of modern data centres, resulting in costly mistakes. The following factors should be carefully considered at the planning stage to avoid issues further down the line:

- Confirm feasibility of construction early

Data centres are getting bigger and demand is not expected to slow down. Data centre providers have been boosting capacity to meet the needs of clients. Because of this, power availability is increasingly limited, with traditional data centre hotspot locations becoming saturated and overstressing the power grid.

Some have explored alternative energy strategies such as the supply of natural gas to power generators rather than relying on the mains. Others have had to relocate the project entirely, with huge repercussions on cost. This means having to redesign the cooling system due to the change in environmental conditions. To avoid issues like these, locations must be thoroughly vetted and feasibility of the construction should be confirmed prior to developing the design in detail.

- Peak Power Usage Effectiveness (PUE)

Annual PUE has typically been a key indicator of the performance of a data centre's cooling system but this has shifted, with peak PUE becoming more important than yearly PUE. This should be factored in at the design stage, as it impacts the technology that should be used for a facility's cooling.

Another important metric is Water Usage Effectiveness (WUE). Managing water consumption is important at a global level, so failing to take into account water usage is a huge mistake that can lead to wastage.

- Materials and installation

Current shortages of raw materials and components are causing major challenges across the globe. Production, delivery and construction programmes are being extended by up to three times longer than before the coronavirus pandemic, with multiple implications on strategy and design considerations. One of the most critical shortages is that of steel, so careful consideration must be given to the costs and availability of steel beams to form the building structure.

'ANNUAL PUE HAS TYPICALLY BEEN A KEY INDICATOR OF THE PERFORMANCE OF A DATA CENTRE'S COOLING SYSTEM BUT THIS HAS SHIFTED WITH PEAK PUE BECOMING MORE IMPORTANT THAN YEARLY PUE.'

Adjustable Depth 4 Post Rack

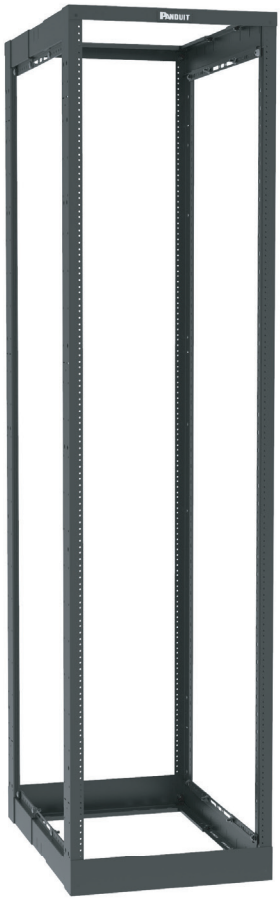
Assemble Your Network Rack in Minutes!

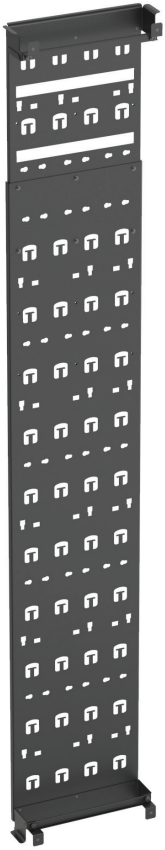
Self-Squaring Capability
Rack is assembled with hardware in two axes, squaring the rack when hardware is tightened

PEM Stud and Carriage Bolt Construction
Eliminates the need for a second wrench and increases speed and ease of assembly

Adjustable Depth
Supports equipment mounting depths from 23" to 42" in 0.5" increments

Masked Grounding Locations
Masked two-hole integrated grounding available at 8 different locations on the rack





Welded Steel Construction
Provides greater stability with a 2000 lbs. load capacity

Numerical Rack Unit Identification
Allows for quick location of rack spaces and faster installation of rack mount items

Multiple Options for Mounting Accessories
Provides greater application victory with accessories such as PDU brackets, vertical tie-off brackets, mount on posts or front-to-back braces

Inward Facing Feet
Reduces overall front-to-back footprint and aligns better to floor tiles

Racks and accessories are available in black or white.

NEW Cable Management Panel Accessory – V4PTOB/V4PTOBWH

The cable management panel accessory routes permanent link cables on the side of the rack WITHOUT impacting the valuable equipment space of the frame, giving it a dual function of HIGH density and simple equipment mounting, not to mention it is TELESCOPIC. This panel will work with 45 RU or 52 RU Panduit 4 Post racks and is sold as an accessory.

RKFL30--SA-ENG 9/2021

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A SMARTER WAY TO CONNECT

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Infinium Core™	Simplified low loss system

These performance levels are achieved by pairing cassettes, trunks, and patch cords to create one seamless and complete solution.

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IAN CATHCART

CHANNEL MANAGER EUROPE AT CHATSWORTH PRODUCTS

When designing and constructing data centres there is a tendency to focus on major, long-term expense costs or capital expenditure (CapEx) rather than the accumulating day to day operating expenses (OpEx).

The heating, ventilation and air conditioning (HVAC) of a data centre can use up to 30 per cent of an entire data centre facility budget. But assessing the most energy efficient cooling system to reduce operating costs, no matter the size of the initial investment into the cooling and climate management systems, is not always considered.

Planning and implementing effective airflow management with a containment system offers two overall benefits:

- It lowers OpEx, but only if there is complete isolation between hot and cold air, and the necessary power, cooling and airflow. It is possible to run high density server loads at higher temperatures by reducing the power consumption necessary to provide cooling to the data centre environment.

- It allows data centre operators to monitor results and increase server capacity where needed. As long as there is complete isolation between hot and cold air, and the necessary power, cooling and airflow, it is possible to run high density server loads at higher temperatures, while providing servers with adequate cooling to prevent overheating and shutdowns.

It is also important to know that exact results of containment will vary for each site. Overall performance, the initial cost of the system (CapEx), the estimated operating cost (OpEx), resulting savings and return on investment will all also vary. But by selecting a single supplier for complete data centre infrastructure needs, including cooling and climate management systems, simplifies infrastructure plans that also reduce overall CapEx and OpEx.

'THE HEATING, VENTILATION AND AIR CONDITIONING (HVAC) OF A DATA CENTRE CAN USE UP TO 30 PER CENT OF THE ENTIRE DATA CENTRE FACILITY BUDGET. BUT ASSESSING THE MOST ENERGY EFFICIENT COOLING SYSTEM TO REDUCE OPERATING COSTS, NO MATTER THE SIZE OF THE INITIAL INVESTMENT INTO THE COOLING AND CLIMATE MANAGEMENT SYSTEMS, IS NOT ALWAYS CONSIDERED.'

ZAC POTTS

HEAD OF SUSTAINABILITY AND INNOVATION AT SUDLOWS

When planning a data centre project, there are many options and factors at play within the design and implementation of the cooling and climate management system. It is therefore easy for things to get overlooked and opportunities can often be missed.

A common mistake made early in the process is constraining the wrong parameters within the specification. If energy efficiency is important – as it should be – specify performance in terms of one of the defined metrics, as opposed to something else which you believe is required for efficiency such as chilled water temperature. When the wrong parameters are specified, often the output is not in line with the true needs and expectations of the project. A system which, on paper, should be efficient, might not be for one reason or another.

Similarly, a specification may outline excessively restrictive requirements. This can severely limit the options available or unnecessarily increase costs. Avoiding this requires challenging every specification requirement to understand why it is needed, the anticipated impact of accommodating it and the alternatives.

During implementation there is also a tendency to overlook 'real life' operation. Data centres are operational environments subject to external variations – ambient temperatures go up and down, load profiles and layouts change, doors open and systems need maintenance.

There are many reasons why a facility may fall outside of ideal operational standards – therefore, considering how the system reacts to these events is important. If a facility is only optimised at an ideal operating point, then the majority of the time there is room for improvement. This undoubtedly impacts performance or efficiency, or both, and for this reason a dynamic system with simple but robust controls is critical to ensuring a real world operation in line with expectations.

'DATA CENTRES ARE OPERATIONAL ENVIRONMENTS SUBJECT TO EXTERNAL VARIATIONS – AMBIENT TEMPERATURES GO UP AND DOWN, LOAD PROFILES AND LAYOUTS CHANGE, DOORS OPEN AND SYSTEMS NEED MAINTENANCE.'

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Marc Naese promoted to chief commercial officer at Panduit


Marc Naese

Panduit has promoted Marc Naese to chief commercial officer. A long time company executive, Naese most recently served as senior vice president of the company's network infrastructure business unit. Throughout his 16 years at Panduit, Naese has played a critical role in shaping the company's technology strategy and has been a driving force behind the global alignment of its commercial strategy.

In this newly created position, he will report directly to Panduit president and chief executive officer, Shannon McDaniel, who said, 'Now, more than ever, organisations across industries and geographies are looking to us for strategies and solutions to support digital transformation, overcome disruption brought on by the coronavirus pandemic, achieve sustainability commitments and more. Marc has both the vision and expertise required to position our customers and our company for continued growth and success.'

Mayflex announces AEM prize winners


L-R Davy Edgar, Thomas Drain, Kevin Dowling and Paul Collins

Mayflex has announced the winners of its 2021 webinar prize draw entries for test and measurement solutions from AEM. Mayflex partnered with AEM in November 2021 to bring its innovative solutions to the UK. To introduce customers to AEM, Mayflex hosted a series of 10 webinars that ran in November and December, with all attendees entered into a prize draw to win up to £10,000 worth of AEM equipment.

Ross McLetchie, Mayflex's sales director, commented, 'We had a great response and there has been much interest in AEM. All webinar attendees were put into a prize draw and the two lucky winners were ACI in Scotland with the TestPro CV100 presented to Thomas Drain by Davy Edgar on behalf of AEM and Mayflex, and KeyNet Solutions in London with the NSA presented to Kevin Dowling by Paul Collins, Mayflex's account director.'

Wire Technologies appoints Nuvias as sole distributor in the UK

Wire Technologies has given Nuvias Group exclusive distribution rights in the UK. Wire Technologies' cabling and enterprise accessories complete and complement Nuvias' intelligent networks and cybersecurity solutions across its vendor portfolio, offering a comprehensive, all-inclusive package that can be deployed successfully out of the box.


Gordon Lyon

'The partnership is focused on providing partners and their customers with complete and cost efficient technology solutions so they can expedite their digital transformation projects,' commented Gordon Lyon, sales director at Nuvias UK&I. 'Wire Technologies have proven they can reliably deliver to our customer needs, which is what we need when stock shortages affect the market.'

ECA appoints Darren Crannis as its new technical manager

Darren Crannis has joined the Electrical Contractors' Association (ECA) as its new technical manager. He was previously managing director of CTS Electrical, which he founded in 2011, and was chair of the ECA Technical Committee, advising on various electrical and technical safety standards including BS7671, Electrical Installations of Buildings - Joint Committee (JPEL), British Standards (BSI), Publicly Available Specification (PAS) and others.


Darren Crannis

Crannis said, 'I am delighted to be joining ECA in this exciting role, having supported the association in various capacities over the past few years. I am looking forward to using my industry knowledge to help ECA members grow their businesses and navigate today's challenging commercial environment.'

Mike Smith, ECA's director of technical, added, 'Having Darren on the team further cements our strong leadership in the electrotechnical industry. His extensive knowledge, experience and expertise will help ECA's members lead the electrotechnical and engineering services industry to success.'

Extreme Networks bolsters expertise with new global sales leadership

Extreme Networks has announced new leadership across its global sales organisation, naming Scott Peterson as senior vice president of global channel sales and Mark Dellavalle as senior vice president of global systems engineering. Both will report to chief revenue officer, Joe Vitalone.

Peterson will be responsible for driving growth in Extreme's global channel program and partner go to market strategy. Meanwhile, Dellavalle will lead the systems engineering team, further strengthening Extreme's team of trusted technical advisors.

'Scott brings the energy, experience and leadership Extreme needs to broaden its portfolio and reach as we transition the company to a software as a service business,' said Vitalone. 'Meanwhile, Mark's knowledge of our markets and how to effectively solve customers' challenges will play a critical role in helping our customers fully understand the impact that our solutions have on their business.'

CHANNEL UPDATE IN BRIEF

North has appointed Stuart Hall to the position of chief financial officer (CFO). With a proven record of scaling high growth technology businesses, Hall will join the executive leadership team to support the next phase of North's ambitious growth plans.

The Global Technology Distribution Council (GTDC) has announced the addition of the Nuvias Group to its membership, furthering its mission to drive channel success and strengthen the value of technology distribution.

Colt Technology Services has announced changes to its sales, marketing and customer success team. Mimmo Zappi is has been formally appointed vice president enterprise and capital markets, and Herve Jost takes up the role of director of Eurotunnel/Getlink connectivity solutions.

Emma Chen has joined MicroCare as regional sales manager for MicroCare Asia. Emma is responsible for the growth and development of the MicroCare electronics and Sticklers fibre optics cleaning business platforms.

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Spot the difference

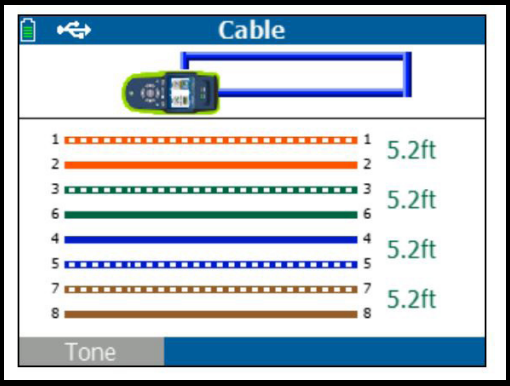
Daniel Klimke of NetAlly takes a look at the various types of test equipment currently available, explains what they do and how to select the right one for your requirements

Most network professionals are familiar with handheld instruments that can be used in various ways to test cabling or a network. But not all testers are the same! A quick glance at any online retailer will find these tools available in prices ranging from $20 into the thousands. But what differentiates these tools and what can they do? Which one is right for you? One way to think about them is in terms of the Open Systems Interconnection (OSI) model in order to help categorise the capabilities of the various types of testers.

PHYSICAL LAYER – CABLE TESTERS

There are three levels of cable testers, each building upon the capabilities of the former, that are defined by the complexity of the testing technology and the 'job' that needs to be accomplished. These jobs are validation, qualification and certification.

Validation testers provide the most basic, or foundational, tests. These simple (and typically low cost) single ended tools conduct a variety of continuity tests – verifying that the pin to pin continuity is correct in the case of wired Ethernet.



Many of these tools can also detect various types of wiring faults and the distance to those faults using time domain reflectometry (TDR). This technology sends a 'pulse' down the cable and when a

termination or break/open is encountered, the signal is reflected back to the test instrument. The distance to fault is a simple calculation based on the time it took for the signal to go out and back based on the nominal velocity of propagation (NVP) of the cable. These testers may also include some additional capability, such as measuring power over Ethernet (PoE) voltage.

Basic optical fibre testers feature a power (light) source and a power meter. Effectively, these test the integrity of a fibre link, but if the expected power received is below specification, they lack the ability to identify any breaks or degradations. To find faults in fibre runs, an optical time domain reflectometer (OTDR) tester is needed but these can be very expensive.

The next type of cable tester is qualification – a pragmatic alternative to expensive certification testers. They are designed for users who want to understand what actual data transmission rate a cable link can support. These tools use one of two core technologies to assess the capability of the cabling. The first type uses many of the same test parameters as certifiers – metrics such as attenuation, return loss and crosstalk – comparing the results to IEEE standards indicating what speed the link should support. The second type of qualifier uses the transmission of Ethernet data packets to measure the actual capacity and speed of the cable plant. Industry old-timers will recall bit error rate testing (BERT) as a predecessor to today's performance testing instruments.

The reality here is that many installed cable plants may not certify to the higher Ethernet speeds of 2.5GBASE-T, 5GBASE-T or even 10GBASE-T traffic. Testing via actual packet transmission may reveal that a cabling upgrade is not needed to support faster Ethernet standards.

> 'Most network professionals are familiar with handheld instruments that can be used in various ways to test cabling or a network. But not all testers are the same!'

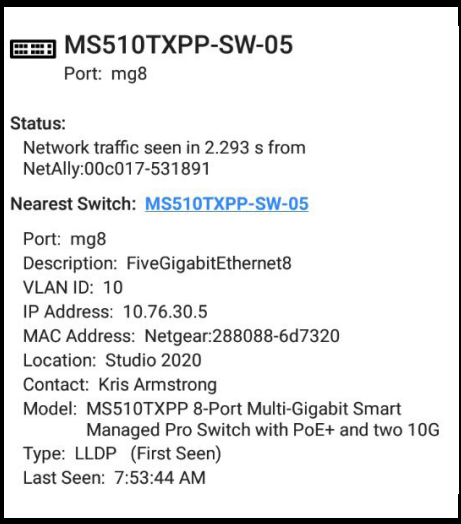
At the top of the cable test pyramid are cabling certifiers. This methodology uses two powerful instruments, one at each end of the cabling, sending a variety of signals and measuring each metric – near end crosstalk (NEXT), far end crosstalk (FEXT), attenuation, insertion and return loss, impedance, etc.

They compare each result to the cabling category standards established by the ANSI/TIA-568 specifications. Certification testing is typically done as the last step of the cable plant installation process, to assure the building owner that the cabling and components are installed to specification and with proper workmanship in order to provide a warranty for the installation.

For many network owners, the cost of these tools and the infrequency of their use puts them in a nice to have category. Validation and qualification tools provide a much more economical approach for day to day network operations.

LAYER 2 – ETHERNET LINK TESTERS

Stepping up to Layer 2, the next category of test tool is the link tester. Various manufacturers offer these 'pocket' testers



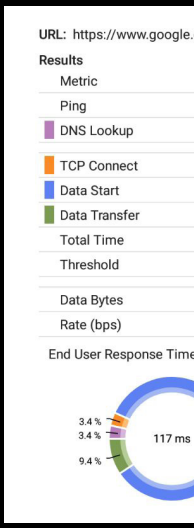
for validating network drops and many link testers also include the basic cable testing capabilities outlined above.

It is important to differentiate between tools that simply detect links (announce the presence of Ethernet link pulse) versus those that can actively connect to the network as an Ethernet device. After link negotiation the tester may include decoding of the link layer discovery protocol (LLDP) frames sent by the connected switch, or other link layer protocols as implemented by the various infrastructure vendors, such as Cisco Discovery Protocol (CDP).

However, to be considered a true network tester one would expect that it will establish a link, report the actual speed and duplex achieved, include switch discovery information, if available, and then verify that all required network services and internet connectivity are available.

LAYER 3 – NETWORK TESTERS

To validate full network connectivity a tester must also include the ability to identify and validate essential network services such as dynamic host configuration protocol (DHCP) and domain name system (DNS), test router/gateway connectivity, and the reachability/responsiveness of servers in the data centre or internet.



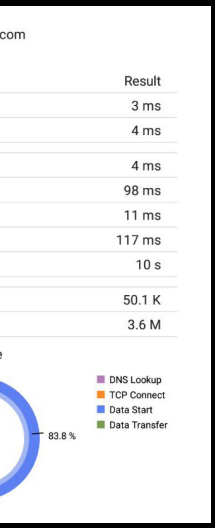
This requires a full TCP/IP stack, so beware of low cost tools that may not have this capability. Having a full protocol stack also allows the instrument to join different virtual LANs, validate static IP addressing, verify firewall port issues and even test proxy servers. For example, multiple DHCP servers is a common problem on enterprise networks, as ignorant end users often connect consumer routers at work, causing rogue DHCP offers, with the result being other users are unable to communicate. DNS response time is a frequent contributor to application performance issues and must also be considered an essential test.

PERFORMANCE TESTERS

Frequently used to validate a WAN provider's service level agreement (SLA) or internal network quality of service (QoS) provisioning, performance testers inject a stream (or multiple streams) of known test traffic from point to point to characterise the capacity, quality and prioritisation of packet transmission.

Typically used in pairs (although there are some single ended test methodologies), best practice is to push

traffic bidirectionally and simultaneously, providing insight into possible asymmetric transmission issues. The results will show whether there was any packet loss (overall throughput), latency (delay), or jitter (variations in delay). Advanced performance testers include multiple streams (up to eight) with per-stream Layer 2 or Layer 3 QoS controls to verify end to end prioritisation.



Ideally, the testers should also be able to validate QoS by tagging the test traffic appropriately and ensuring that QoS was maintained from end to end.

NETWORK ANALYSERS

In the broad category of network analysis there are many capabilities that are frequently necessary when solving complex issues, and these are often found in more advanced network analysis instruments:

- Traffic analysis. Real time inspection of packets, measuring end user response time components to determine if the network is slow, there really is a network issue, or something else.

- Line rate packet capture. Off the shelf network adaptors in a typical PC or laptop are incapable of handling multigigabit speeds. Using dedicated instruments with custom hardware and line rate filtering for capture is essential for complete analysis.

- Switch/router analysis. Typically uses SNMP to query infrastructure components for interface information including typical usage and traffic stats by port (utilisation, errors, discards, uptime, etc)

- Network discovery. Using various discovery protocols to determine what devices are on the network, where they are connected and the paths between them. With more advanced tools, this data can be displayed in a graphical topology map. ■

DANIEL KLIMKE

Daniel Klimke is director of marketing at NetAlly and is responsible for brand and product management, as well as field and channel marketing. He began his career at Leviton and he took a training and channel marketing position at Fluke Networks in 1997, followed by various roles in marketing and product management. This included the transition to NetScout Systems in 2015. He then led the product and brand marketing transition with the divestiture of the business unit and the launch of NetAlly as an independent company in 2019.

NetAlly

NetAlly's family of innovative network test solutions have been helping network engineers and technicians better deploy, manage and maintain complex wired and wireless networks for decades.

For more than 25 years, we have been the number one ally of network professionals worldwide. We began by making the world's first handheld network analyser – the LANMeter – and have continued as industry pacesetters ever since.

Voted for 2021 Network Infrastructure Product of the Year and CI&M Cabling Innovators Award, NetAlly continues to set the standard for portable network testing. We are passionate about innovation and motivated by one purpose – to create the best test equipment possible, designed with your success in mind.

Network professionals around the world trust our best in class tools to deliver the visibility needed to get the job done, fast.

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

Mayflex

Available from Mayflex, AEM TestPro CV100 testers provide the fastest Category 6A certification test on the market today at just six seconds.

These technically advanced testers provide both copper and optical fibre certification. The main and remote are the same and can be deployed separately to conduct power over Ethernet (PoE), IP network, Multigigabit Ethernet and Wi-Fi testing, and they come with easy and intuitive software.

Each TestPro kit comes with the three-year care plan package that not only covers the yearly calibration costs but also any accidental damage – even replacing the permanent link and channel adaptors once a year if they become damaged. Therefore, ongoing costs are kept to an absolute minimum, virtually zero.

With global vendor approval and a trade-in offer running until the 30th June, why wouldn't you contact Mayflex to talk about how you should consider AEM for your next tester purchase?

For further details **CLICK HERE**, call our sales team on 0800 757565 or **CLICK HERE** to send an email.
www.mayflex.com

Trend Networks

LanTEK IV-S from Trend Networks is the company's fastest, most powerful and easy to use copper and optical fibre cable certifier.

LanTEK IV-S has double the power of the original LanTEK IV model. It builds on its exceptional functionality and reliability with a new dual core processor, new 3.0 operating system software and twice as much memory storage, enabling 5,000 tests to be saved. LanTEK IV-S also features a touchscreen user interface that is 42 per cent faster.

Testing links with LanTEK IV-S can now be done 16 per cent more quickly and to help manage the test data, the best in class Trend AnyWARE Cloud system has received a major speed improvement powered by Microsoft Azure. It also includes a unique, intuitive folder structure that makes organising tests much easier.

To maximise value, the LanTEK IV-S cable certifier can be purchased as part of cost saving bundles. Upgrade deals and trade-in discounts are also available. To find out more **CLICK HERE.**

www.trend-networks.com

Cable Management Warehouse (CMW)

Available from CMW, the optical fibre OWL 7 bi-directional certification optical loss test set (OLTS) is a small, light and extremely affordable bi-directional fibre optic link certification tester. You can certify two fibres in both directions simultaneously, meaning it is four times as fast as traditional certification.

Tier 1 certification for both multimode and singlemode is accessible in the same unit, with user friendly diagrams guiding users through the testing process. Helpful diagrams on the screen prompt the user to connect the tester to the link and text based help screens are available in case users have questions in the field. Engineers can also produce professional certification test reports.

These products are a fraction of the cost of bulky certifiers, saving cost conscious technicians and installers money. They are also nearly a third of the size and are hand handheld pocket sized devices that can be operated with just one hand.

www.cmwltd.co.uk

The Owl product range is available from CMW and you can find out more by **CLICKING HERE.**

www.cmwltd.co.uk

Patch Solutions

Available from Patch Solutions, the Hobbes Portable Pen Style Fibre Checker Pro is ideal for checking defects by sending a laser light through a fibre optic cable. Breaks or faults in the fibre will refract a red light, creating a bright glow around the faulty area requiring repair.

Operating at a wavelength of 650nm, this tester has a visibility range of up to 3km using its high power laser diode. You can quickly test both singlemode and multimode cables with an optional adaptor. The checker can be set to operate in a continuous wave or pulse mode, creating easy visual identification depending on the density of the environment.

Its dust proof design keeps the fibres clean and can be used with common fibre interfaces such as ST/SC/FC and FDDA. Measuring just 150mm, its pen style design makes it an essential pocket sized rugged tool, with a useful LED indicator showing power and low battery levels.

The Hobbes Portable Pen Style Fibre Checker Pro is competitively priced and available immediately. For more information **CLICK HERE** or call our knowledgeable sales team on 01442 890890.

patchsolutions.com

Networks Centre

As Fluke Networks celebrates its 30th anniversary, Networks Centre is proud to retain the title of Fluke Networks' UK Distributor of the Year 2021. Networks Centre is proud and honoured to receive such an accolade from the leading manufacturer of network infrastructure test equipment. The NWC group including Comms Centre has now received this award for the past four years!

L-R Keith Saywer and Duncan Lindsay of Networks Centre and Jatinder Kalm of Fluke Networks

Fluke Networks' legacy involves more than just developing excellent test equipment. It has relationships with all the leading structured cabling manufacturers, facilitates major projects with LinkwareLive and has in-depth technical expertise.

Networks Centre and Comms Centre recognise that our success is inextricably linked to being able to offer customers premium equipment and services. The Fluke Networks Gold level service agreement, coupled with Networks Centre's Concierge Service, provides complete peace of mind for customers with a fleet of Fluke Networks' testers.

For more information on the offers Fluke Networks has announced in association with its 30th anniversary **CLICK HERE** or call 01403 754233.

www.networkscentre.com

Comtec

At Comtec, part of the ETC Group, we offer test and measurement solutions for a wide range of applications and represent many of the industry's leading brands. These include AFL, Fluke Networks, Honeywell, Tempo Communications, Trend Networks and most recently Viavi, for whom we are a premier partner.

We have solutions for last mile FTTX network activation, service installation and performance optimisation, as well as devices for testing optical fibre, copper, voice and electrical cabling, Wi-Fi, gas detection, security cameras and TV signals.

Why not try before you buy by utilising our hire service and get up to four weeks of rental fees back if you go on to purchase? We also offer finance options if you need to spread the cost of purchase.

CLICK HERE to view the range. Alternatively, contact the team on 01480 415000 to discuss your requirements or to arrange a demo.

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Sky high thinking

Dan Barrera of Trend Networks explains what to look for when evaluating cloud software solutions for handheld testers

Every industry that handles data is currently migrating its software solutions to the cloud. The cloud offers innumerable advantages compared to offline solutions, such as continuous back-up, access from anywhere and eliminating the need to install updates to access the latest features. I will examine the current solutions in the communications cabling testing market, what functionality you should look for when evaluating cloud solutions, and what metrics you can use to measure the performance of cloud software systems.

1.

THREE OF A KIND

When examining the handheld copper and optical fibre cable test equipment market, there are currently three different internet enabled solutions for transferring test data from a field tester to a computing platform for analysis and reporting.

Self-hosted

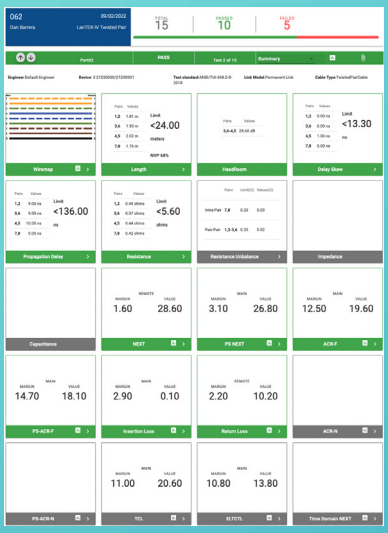
This is where traditional PC software is run on a desktop computer and the user is responsible for making it accessible by the field testers via the internet. This solution has shortcomings. Firstly, you are now

your own ISP/cloud administrator, dealing with the configuration issues that come with setting up and maintaining an internet server. Not to mention the potential security risks that come with having an open gateway into your corporate network. This is not a true cloud solution, just a workaround to get data without having to drive the testers from the field to the office or post USB drives.

2. Hybrid cloud

This is a hosted cloud solution with limited ability to work with your data. With hybrid solutions, cloud software can present the test results to users and generate reports, but it does not have the programming or processing power to analyse test results or allow complete project management. Copper certifier test results contain tens of thousands of data points and the processing power and user interface ability of hybrid systems do not allow project managers to analyse test results in detail to look for faults or systemic issues in the installation.

Should a user need to evaluate a measurement further, an extra step is required – to download the test result from the cloud to the desktop PC software. Here, the full user interface and processing power of the PC's central processing unit (CPU) can be used to evaluate the graphical data of a copper cable certification test.



3. Full featured cloud

This is a fully hosted cloud solution with the computing resources to provide the same features and functionality as one would expect with desktop PC software. Users might only realise it's running on the cloud as they are using it in a web browser. This solution offers advantages:

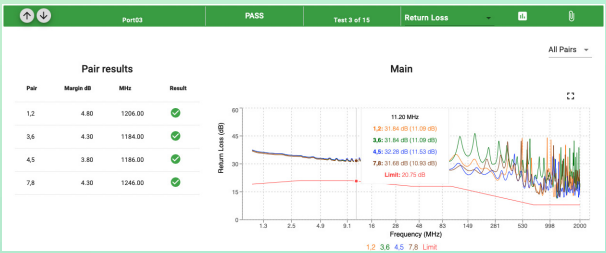
- The application is always up to date. You never need to install software patches
- When hosted by a provider like Microsoft Azure, your data is continuously backed-up
- The full details of the test results can be analysed because the test equipment manufacturer is paying for the processing power and application development to replicate a desktop experience in the cloud
- There's no limit to the number of simultaneous connections of technicians uploading test results, project managers managing data, or finance managers pulling reports to attach to invoices
- Bandwidth and storage are free and unlimited, depending on your test equipment provider's terms and conditions

FEATURE EVALUATION

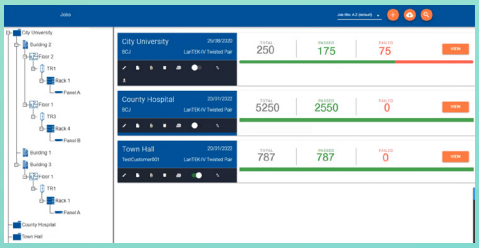
When evaluating a cloud solution, there are key points to look for. Being able to view detailed test results with all plot data, in real time, is a key feature in full cloud systems. With the large amount of data to manage and display, only the latest cloud engines can efficiently perform this. The advantage is

‘Some manufacturers include software in their testers that allow someone using a cloud application, sitting anywhere in the world, to remotely connect.’

that when tests fail, users can evaluate the measurements to determine the possible cause and suggest corrective action to the field technician.



The ability to organise data is essential. Typically, test results are delivered to a project manager in one folder from the tester. They will then build out a folder hierarchy that represents the logical structure of the cabling system and drag and drop the test results accordingly. Be sure the cloud solution you choose has this capability to avoid a disorganised mess that can make assessing the progress of a



project impossible.

Fleet management is where cloud software keeps track of each of your testers, logging when it was last synchronised, its calibration date, the assigned technician, the number of tests performed and other pertinent data. Keeping track of calibration dates is vital. If you are installing and testing cabling for vendor warranty programs, most will not accept test results from testers that are outside of the calibration window. If your cloud software keeps track of calibration dates, you won’t accidentally send a tester on-site that is out of calibration.

SUPPORT STRUCTURE

While this article is discussing cable certifiers, there are other cable and network testers used for testing and troubleshooting. Many manufacturers are migrating more testers to the cloud so that a single software solution can be used for multiple testers. Some even have plans to support legacy testers that don’t have direct internet connectivity. Those testers can use a smartphone app as a gateway to connect with Bluetooth to transfer data from the tester to the cloud.

While not a cloud software feature, a tangential feature to look for in your tester is whether it has remote control capability. Some manufacturers include software in their testers that allow someone using a cloud application, sitting anywhere in the world, to remotely connect. This allows remote training and troubleshooting for less skilled technicians.

PERFORMANCE METRICS

The performance of cloud software and the user experience is affected by the back end software and the amount of processing

power. The tester manufacturer can specify how many CPUs they want to dedicate to their application at any moment depending on user demand, so if the optimum number of CPUs is allocated, it can provide a high performance experience.

Two key performance metrics are upload and test processing speed, and report generation speed:

- Upload and test processing speed depends on two factors. One is the user's bandwidth. If the user's internet connection is limited, the cloud service cannot be blamed for slow processing. However, assuming the user has a speedy internet connection, the cloud should be fed a continuous stream of data.

  Copper certification results contain a lot of data, and if the cloud software allows full analysis of the data it needs to process all those test points so that the data plots can be presented in full detail. Ideally this process should happen in near real time, so that once the tests are finished uploading from the tester the results can be viewed with minimal delay.

- Report generating speed is the time it takes to generate PDF reports from the time the user selects the tests and starts the reporting process. This is another function that is CPU intensive, and the time taken depends on how the host chooses to ration CPU time. When evaluating cloud solutions, request a demonstration of test processing time and report generation time.

SELECTION PROCEDURE

Nobody is content to sit and wait for software to finish doing its thing. We are all busy and time is money. Choose test equipment wisely. ■

DAN BARRERA

Dan Barrera is global product manager data cable testers at Trend Networks, where he manages the product development, and sales and marketing of the group's copper and fibre data cable and network installation and maintenance test equipment for global markets. Having been in the industry since 1997, Barrera represents Trend Networks at the Telecommunications Industry Association (TIA) TR-42 and ISO/IEC SC25/WG3 committees, developing the latest standards for copper and fibre optic cabling systems. He also enjoys technical presentations and carrying out hands-on training seminars for industry organisations such as BICSI, IBEW/NJATC and CEDIA.

Start as you mean to *go on*

Alex Brew of Vertiv explains why sustainability will continue to dominate the data centre sector

The rapid growth in demand for data centres, spurred by the coronavirus pandemic and combined with the recent focus on the industry's global energy consumption, means sustainability and climate change are top of the agenda for owners and operators. Influencing this trend is the urgency of the climate crisis and the relationship between resource availability and rising costs.

INTO OVERDRIVE

Data centre operators should be looking to adopt sustainable energy strategies, utilising renewable technologies. Providing both AC and DC power, such hybrid distributed energy systems can improve efficiencies. More importantly, they open up data centres to the prospect of operating 24/7 on carbon free energy (and back-up energy) generated locally.

Several other factors will play a key role in providing a resilient and sustainable power infrastructure, operating autonomously from the grid. These include fuel cells, renewable assets and long duration energy storage systems based on lithium-ion battery solutions. On this latter point, it's anticipated the uptake in lithium-ion batteries will increase as we see a continuation in their widespread adoption in data centre applications.

Sustainable action will also be seen in more efficient and eco-friendly thermal management systems. This will include the phasing out of refrigerants with high global warming potential (GWP), and a move to the more favoured low GWP platforms.

ADDRESSING THE CLIMATE CRISIS

From the wildfires in Australia to the increased likelihood of floods in Europe in key data centre regions, extreme weather is forcing operators to rethink where they build data centres. Other factors, including the reliability and affordability of the grid, will also affect the decision making process.

To address this, organisations should begin focusing on the availability of sustainable energy sources – primarily solar and wind. The ability to leverage renewable and locally generated sustainable energy deployments will also act as a component in helping to ease site sourcing and location challenges.

These factors will influence the design of data centres and telecommunications networks too, driving demand for more robust infrastructure systems across

the information and communications technology space. All of this will need to be carefully aligned with sustainability goals. The year ahead will see data centre and telecom operators continuing to wrestle with these issues within their ageing estates – as well as the ever-present latency question – all of which will drive a need for solutions to address these challenges.

GET REAL

With today's networks becoming increasingly complex and more distributed, and as the augmented and virtual reality demands of the metaverse become more prominent, the need for real time computing and decision making is critical. This urgency is sensitive to network latencies and under the increasingly common hybrid model of enterprise, public and private clouds, colocation and edge, full time manual management is impractical – if not impossible.

Moving forward, artificial intelligence (AI) and machine learning will be instrumental to optimising the performance of these networks. However, it will take focus and time to collect the right data, build the right models and train the network platform to make the right decisions.

'From the wildfires in Australia to the increased likelihood of floods in Europe in key data centre regions, extreme weather is forcing operators to rethink where they build data centres.'

Thankfully, programming tools have become simplified enough so that data scientists can utilise computing resources, without having to be specialists in hardware or programming themselves. The availability of AI hardware and cloud options from experienced vendors, a simplified toolchain, and an educational focus on data science has put AI in play for even smaller companies. All of this indicates an accelerated AI adoption.

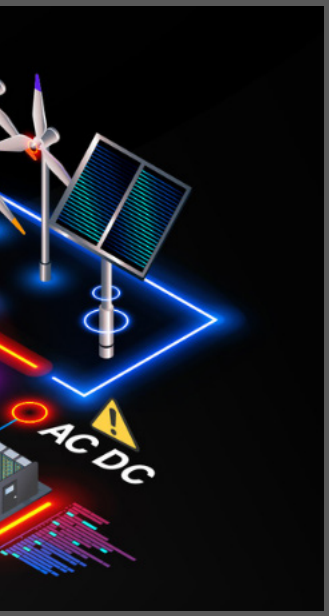
As with every technological advance, there will be a ripple effect. The increase in AI will increase computing and heat densities and, by extension, accelerate the adoption of liquid cooling. Among other challenges, lowering the barrier to entry puts a premium on choosing the right platforms and systems to trust.

TAKING SHAPE

Last year, the industry anticipated a focus on bringing hyperscale and enterprise level capabilities to small spaces and edge sites. Approximately 2.9GW worth of new data construction is underway globally – quite an increase from 1.6GW in 2020. As we begin to see the unveiling of new data centres built specifically to meet the needs of a post-pandemic world, even more activity will be directed from the edge.

Research by VMware projects a dramatic shift in workload distribution, whereby edge deployment will rise from where it currently stands at five per cent to 30 per cent over the next five years. This means availability will remain the top priority, even at the edge. However, at the same time, lower latency is becoming a rising necessity to support smart buildings, smart cities, distributed energy resources and 5G.

The continuation of hybrid and remote work, along with a greater reliance on e-commerce and telehealth, video streaming and the increased adoption of 5G, will also require more investment in the edge. To manage the associated rise in energy consumption, we'll see the utilisation of new, more innovative and more efficient products and practices.



TOWARDS INTEGRATION

Data centre equipment providers have been embracing integrated systems that allow for modular capacity additions for years, with integrated racks, rows and full integration of large portions of the power chain now among today's most popular data centre offerings. We'll soon see the next step in integration, as data centres work with providers to expand the prefabricated and integrated approach to not just the power infrastructure, but also their thermal management platforms.

The benefits of integration as a concept are well known – offering reduced construction and deployment costs, as well as flexible capacity management. Applying the same approach across larger systems delivers speed.

MAKING A MOVE

Data centre operators and suppliers are now actively pursuing strategies that can make a real difference in addressing the climate crisis. This will be marked by a focus on energy efficiency, the use of alternative and renewable energy technologies and zero carbon energy sources, and industry partnerships centred on impactful sustainability efforts. The actions data centre decision makers take on these fronts will have a profound impact on the environment and digital economy. ■

ALEX BREW

For the last three years, Alex Brew has led Vertiv's sales organisation in the UK and Ireland, and is responsible for all product and service sales through its direct and channel teams. Joining Vertiv in 2014, he led technical sales of the Vertiv thermal management product portfolio, working across multiple projects in the data centre and mission critical environments before progressing on to lead the enterprise business and then into his current role.

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Where the smart money is

R&M's Matthias Gerber takes a closer look at some of the key developments that are proving essential for next generation intelligent buildings

Until relatively recently, discrete groups of in-building resources would be devoted to one particular function. Telephony, for example, or internet, security, building infrastructure or data. Today, however, we're seeing integrated pools of processing, storage and networking resources being shared across multiple applications.

COME TOGETHER

For intelligent buildings, the convergence of previously disparate systems has accelerated. An increasing number of devices are fitted with IP connectivity, enabling more sophisticated building automation solutions. Systems such as lighting, facility management and heating, ventilation and air conditioning (HVAC) are sharing network infrastructure with data and telecommunications.

Demand for infrastructure that allows a wide range of functionalities to be managed and monitored over converged LAN based networks is growing. Convergence of LAN and building management is helping to reduce the cost of labour and devices, making cabling coverage less complex, and device implementation faster, efficient and flexible.

Convergence allows users to make the most of increasingly sophisticated system intelligence. It can provide enormous efficiency increases, from both technical and business perspectives, centralising the management of IT resources, consolidating systems, boosting resource utilisation rates and lowering costs.

OPPORTUNITY KNOCKS

All over IP opens up greater development opportunities for intelligent buildings. All devices involved in building technology and building management communicate in the same way, without barriers, over Ethernet/IP, with a LAN providing the basis for physical communication. Internet and the cloud can be integrated in the background and convergence enables the sharing of (virtualised) resources across applications and provides high levels of standardisation, availability, reliability and support for new deployments.

In theory, IPv6 can allocate some 1,500 IP addresses per square metre. Networks can be scaled up or down with relative ease, and devices added without affecting network performance

or reliability. IP will increasingly replace previously separate systems, transporting data along with power, lighting, security and more. Another key benefit of all over IP networks is improved network security. Unlike conventional fieldbus systems, IP features built-in security features for authentication and access control.

LOOKING UP

This approach extends the data network and facilitates power over Ethernet (PoE) through an entire building's ceiling, making it possible to connect devices to building automation via zones with pre-installed overhead connecting points called service outlets. The plug and play connection of network switches, sensors, controls, wireless access points and other distributed building services removes barriers and reduces costs.

The digital ceiling will increasingly provide services that building occupants and managers are going to need in the near future, and for years to come. It will enhance the user experience while reducing energy usage, making maintenance and adding new devices faster and easier, lowering installation and device costs, increasing layout flexibility, and providing a more comfortable, healthier working environment.

The digital ceiling is an open, unified platform, so building managers and application developers can continuously find new ways of integrating functionality. Power saving technologies and applications can be introduced, such as intelligent management of building space, resources and PoE based LED lighting.

SINGLE LIFE

As building management becomes increasingly digital and IP based, Single Pair Ethernet (SPE) cabling based on xBASE-T1 using a single twisted pair for data transmission will support new network structures, such as the digital ceiling, for the cabling of the final few meters. It can transmit up to 50W along with data and control signals.

SPE is replacing traditional fieldbus connections, which

unlike SPE do not penetrate all automation levels. Environment agnostic SPE makes it possible to integrate field devices, sensors and actuators into an existing Ethernet environment, without extra gateways and interfaces.

'Single Pair Ethernet (SPE) cabling based on xBASE-T1 using a single twisted pair for data transmission will support new network structures, such as the digital ceiling.'

Synergies reduce operating expenses and manufacturer neutral standard products can be used. IT and fieldbus components are integrated, installation and maintenance simplified, and the costs of material and operating expenses are reduced. Compared to traditional Ethernet cabling with the RJ-45 form factor, the SPE approach offers a significantly higher number of possible connection points, and lower volume and fire load in cable pathways.

POWER RANGER

Intelligent building networks need to be capable of powering large numbers of remote devices. New generations of high power PoE will have a considerable effect on infrastructure. Today's PoE provides more than three times the level of power than the previous standard, and more than six times the level of the initial PoE standard. To handle increased temperatures, cable type, bundle size, cable duct properties, link lengths and other factors must be considered.

As more wireless access points and devices with IP addresses are introduced in line with the growth of Wi-Fi 6, 5G, the internet of things (IoT), intelligent buildings, smart cities, Industry 4.0 and more, the need for PoE is growing. Not only is the number of devices growing – higher levels of power are being demanded for everything from computers

to digital signage.

Planners and end users also need to consider the new remote power categories in the EN 50174 series of installation standards, which define the capability of an installation to support the different types of PoE. Individual channels that meet EN50173-1, using connectivity according to IEC 60512-99-2, will support the highest level of PoE (4PPoE with 90W).

MAKE THE CONNECTION

Intelligent buildings are, by definition, full of electronics, sensors and all kinds of controllers that enable systems for presence detection, HVAC, lighting, security and so on to work. The combination of a uniform cabling system based on structured cabling for LANs and a common language based on Ethernet/IP can help realise this. Being able to use uniform, manufacturer independent connectivity and transmission protocols makes installation and maintenance easier, increases the number of connection points, and reduces material and operation costs. The resulting networks allow flexible, universal, simple installations and make intelligent building installations even more ecological, economical, convenient and secure. ■

MATTHIAS GERBER

Matthias Gerber, market manager LAN cabling with R&M, has worked in various positions within R&M for over 20 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 being chairman of the Swiss National MirrorCommittee for TC48.

HellermannTyton

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

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

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

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

Siemon

Siemon provides a range of industry leading Category 6A solutions that are perfectly aligned to intelligent building requirements. The Z-MAX Category 6A copper cabling system has best in class performance, fast termination and remote powering capabilities. It provides an ideal IP based physical infrastructure to effectively converge data, voice, video, lighting, security, building automation and other low voltage building systems in intelligent buildings.

For field termination needs, the Siemon Z-PLUG enables the seamless connection of power over Ethernet (PoE) devices for a range of applications including lighting, wireless access points, audiovisual equipment, distributed antenna systems (DAS) and building automation systems (BAS). Z-PLUG can be terminated to both shielded and unshielded, as well as solid and stranded cables.

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

Panduit

Panduit's Adjustable Depth 4 Post Rack is tailored to network equipment in data centre and telecommunication environments. Each rack has 39 different depth options – from 584mm-1066mm in 13mm increments. The rack can be assembled in minutes and is self-squaring when assembled with the option of eight different masked grounding locations.

Upgrading active equipment in telecommunication rooms and data centres often requires a deeper rack than standard supplied units, which the Panduit 4 Post Rack system offers. It combines the stability of a cabinet with the accessibility of an open rack to provide maximum flexibility when designing a network layout.

Increased mountings allow for accessories such as power distribution unit (PDU) brackets, vertical patch panel brackets and vertical tie-off brackets to create greater application flexibility. Available in black and white, the rack has a UL load capacity of 907kg, offering a highly adaptable rack and cable management system.

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

R&M

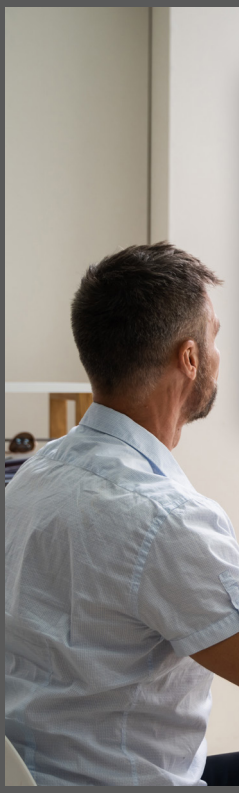
Power over Ethernet (PoE) supplies power directly via Ethernet cable to terminal equipment – now up to 90W. As a result, systems such as smart displays, intelligent PoE lights and actuators are being increasingly used in building installations. With the introduction of remote power categories, PoE support is now also regulated for generic building cabling. However, interpretation of installation standards often turns out to be a complex task.

Matthias Gerber, market manager LAN cabling with R&M, has researched this and is supporting planners and installers with new and simpler methods of PoE planning for building installation. He said, 'The problem is not the cables themselves, but more in the way they are installed. However, these two aspects are closely related.'

In an expert interview, he discusses a number of issues and solutions. One solution is a calculator that defines all underlying conditions and clearly documents standards compliance.

To read the full article and find out more **CLICK HERE.**
www.rdm.com

Stop, look and *listen*



Rob Kelly of Sudlows explains how audiovisual (AV) systems have played a key part in keeping businesses moving forward during the coronavirus pandemic, and how they are often front and centre in modern buildings

The provision of an intelligent building requires many different technologies and platforms working together harmoniously to provide users and building residents with an efficient, comfortable and highly positive user experience. Many of these technologies remain unseen to the average occupant, however, AV systems within intelligent buildings are often one of the main interaction points.

INNOVATION AND COLLABORATION

Differing generational mindsets around agile working and work-life balance were already precipitating the need for AV systems to respond to changes in working practices. This shift was further, and rapidly, escalated by recent global events and AV systems have ended up playing a key part in keeping businesses moving forward during this time.

The wheels of business and innovation are driven by the collaboration of people. Historically, this would mean high expenditure in both cost and time in getting people together for a face to face meeting or the use of limited audio bridge solutions, resulting in a poor meeting experience. The AV industry responded and now offers a wide variety of collaboration solutions to enable people to meet remotely, share and interact with content across large geographical distances, and access an array of additional tools such as chat functions, file sharing, task planning and so on.

SPACE RACE

Intelligent buildings should now be leveraging AV technologies to enable smart meeting spaces that provide user friendly, collaborative environments for occupants to go about their work. These meeting spaces range from individual 'phone booth' style single person video conference set-ups to large scale conference and training rooms, which are multifunctional in nature. These can be set-up in different configurations for different use cases, while being controlled from a single user interface or application.

When deploying meeting spaces, an organisation should ensure that a consistent approach is taken with regard to the hardware and software selection for these systems, and ensure that the same methods of connectivity are used. The user interface deployed should also be common

across all spaces, so that a consistent and positive user experience is provided.

In bigger buildings there is a growing trend to deploy large scale event spaces. These can act as flagship solutions for supporting corporate events such as annual general meetings, product launches and even concerts. These spaces require a significant amount of AV technology and integration with other connected solutions such as video recording, editing technology and web streaming solutions. Fully understanding and documenting the requirements of the space is of critical importance so that a robust design can be completed, capturing all functional requirements, and ensuring that product selection, video, audio distribution solutions and space control are successfully deployed.

WORKPLACE OPTIMISATION

AV solutions and their connected technologies also provide another opportunity within intelligent buildings. As the workplace has become more agile, the need to manage the environment to adapt to that agility has also increased, as has the desire to deliver a return on investment from these technologies by enabling workspace optimisation.

Workplace management solutions that interface with AV spaces and collect valuable management information about how a workspace is being utilised is a great example of how powerful these tools can be. The ability to monitor and analyse meeting room bookings and any non-attendances of those bookings, or the ability to monitor and track hot desk booking at utilisation, are powerful tools

‘Differing generational mindsets around agile working and work-life balance were already precipitating the need for AV systems to respond to changes in working practices. This shift was further, and rapidly, escalated by recent global events.’

in allowing businesses to optimise their workspaces.

These tools can also further improve the user experience with applications that support wayfinding for routes to meeting rooms, kiosks showing hot desk locations, even the ability to request catering services for meetings. Other valuable tools also exist to improve user confidence in coming into the workplace, with many management solutions now including features for monitoring the number of users in an allotted space and even restricting access based on user occupancy. The intelligence in these solutions can also enable the dynamic restriction of desk usage to ensure separation of people within the workspace and automatic requests for desk cleaning once a user has finished at a hot desk.

RIGHT PLACE, RIGHT TIME

Supporting AV solutions, particularly for oganisations that have multiple sites, can also be a challenge. Ensuring that the right people technically are on the ground can often be difficult and sending engineers to site for minor fixes is a costly endeavour.

AV management systems are evolving to include artificial intelligence and machine learning to detect instances of set-up errors and minor issues, and have the ability to automatically send commands to the AV solution to rectify the issue. For example, if a meeting space has been left in the wrong configuration, the management platform is capable of resetting the solution to its default starting point, thus helping to reduce not only the cost of fixing the issue encountered, but also dramatically improving the time taken to fix.

These systems offer support to businesses looking to move towards a greener position by being able to turn off

and wake up devices such as display panels at certain times, or after a defined length of non-operation. This serves to boost an organisation's green credentials, while also playing a part in lowering operational expenditure.

ENGAGING BUILDINGS

People consume information and there are many examples of where it is desirable, or even mandatory, to display information. Intelligent buildings work to actively engage occupants using AV solutions as a highly functional and adaptable medium.

Within the workplace this could be simple signage for organisational messaging or wayfinding for visitors. Some more advanced content management systems allow for regular scheduling of content, as well as remote updates. Content can also be amended according to building posture. For example, if there is a fire alert all the screens can automatically display alerts and routes to the nearest fire escape. Audio solutions can also be tied into this so that the audio solution plays its part in delivering audio announcements and route instructions.

Signage and content management are of particular importance to the retail and hospitality sectors, with things like self-service touchscreens and menu boards becoming the norm. Content can be pushed dynamically to screens by, for example, reducing pricing on over stocked items or updating advertising based on trends. We are also seeing the growing use of augmented reality in certain retail scenarios, driven through AV solutions, with shoppers being able to 'virtually' try on clothes or having a car customised in real time in front of a potential buyer.

OPPORTUNITY KNOCKS

AV solutions within intelligent buildings provide a huge opportunity for engagement with occupants and can enhance their experience. These solutions are amongst those that users interface with the most, while also providing valuable building intelligence and potential operational savings when deployed alongside the correct management platforms. The general shift towards a more agile workspace ensures that the demands on the technology stack is only going to increase. ■

ROB KELLY

Rob Kelly has been in the communications and networking industry for over 20 years, since entering as an apprentice cabling engineer. He now holds the position of head of technology at Sudlows. During his career Kelly has successfully delivered projects across numerous technology disciplines and in a range of different environments. He heads Sudlows' Smart Technology Division, which deploys a range of intelligent building solutions.

European Space Agency uses Yokogawa instruments to achieve precise laser tuning for satellites

The European Space Agency (ESA) is using Yokogawa's optical wavelength meters to ensure the accurate tuning of lasers used in Earth to space communications.

ESA operates a network of geostationary satellites known as the European Data Relay System (EDRS). These satellites communicate with a constellation of European Low Earth Orbit (LEO) satellites, called Sentinels, which are used for Earth monitoring applications. EDRS satellites use radio communication to upload the LEO satellites' images and other data to terrestrial servers.

The growing amount of information from LEO and geostationary satellites, and from satellite constellations, means that the available bandwidth from radio communication links will soon be too low to meet ESA's data transfer needs. Optical, laser based communication is the obvious answer – a technique already used to transfer data between the LEO satellites and the EDRS network.

Optical communications in free space between the Earth and a satellite calls for special laser technology. This is because optical signals transmitted between the Earth and space are subject to interference from various sources, such as clouds or other weather phenomena. In addition, optical signals in free space cannot be shielded from external sources of optical interference by the physical medium through which they travel.

ESA is implementing optical Earth to satellite communications technology in its optical ground station (OGS) at Tenerife and at the Aristarchos telescope at the Chelmos observatory in the Peloponnese. Maintaining the exact transmitter wavelength is a critical part of the Aristarchos system's operation, which uses a technique where the transmitter laser is pumped by an 808nm laser diode to generate an accurate 1064.625nm ±11pm output. This wavelength is controlled accurately by adjusting the operating temperature of the transmitter laser.

The ESA selected a specialist optical wavelength meter – the AQ6151B from Yokogawa. It uses a Michelson interferometer, capable of measuring wavelength very accurately and its accuracy is specified at ±0.2 ppm. The AQ6150 series offers high speed, with the ability to acquire, analyse and transfer a measurement within 0.2 seconds. As well as high accuracy, the AQ6150 offers simultaneous measurement of up to 1,024 wavelengths and handles input signal power as low as -40dBm. The AQ6151B also has built-in analysis functions and requires no programming, making it easy to use.

By using the AQ6151B to tune lasers, ESA expects that optical transmission could take on the burden of handling high bandwidth traffic, replacing radio communication as the primary means of sending and receiving data from satellites.

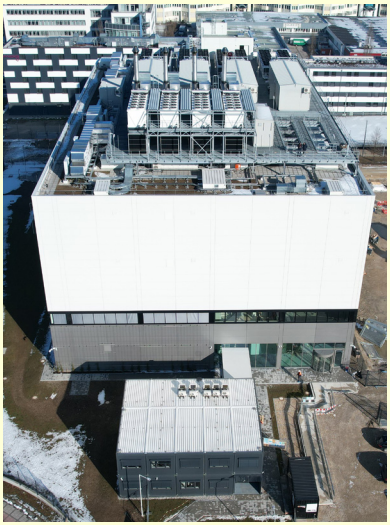
City of Edinburgh Council set to smarten up CCTV with £2.6m investment

North has secured a £2.6m contract with the City of Edinburgh Council to revolutionise security and surveillance. The contract will see the build and management of Edinburgh's new CCTV Control Centre, which will form part of its vision to create a Smart City Operation Facility, providing a holistic view of the city by utilising the latest technology to drive operational efficiencies, improve security and analyse trends.

The new CCTV Control Centre will see the provision of high definition cameras, expanded security coverage, and the introduction of advanced analytics and artificial intelligence that can provide situational awareness, and predict and alert new and existing threats. The project will see North intelligently integrate the security system with traffic and transportation platforms to enhance the management of city operations.

This will improve efficiency, quickly identify and address issues, provide simple and rapid retrieval of footage, and integrate with remote security systems. It will also allow for better city planning and provide a richer view of how people interact with the urban environment.

Sustainability innovations take centre stage at Equinix's new German data centre



Equinix has opened its new International Business Exchange (IBX) data centre – MU4 – in Aschheim, near Munich. MU4 will support the growing digital needs of local companies by providing them with direct, secure and fast connections to cloud providers, services and partners.

MU4 is designed in line with Equinix's global sustainability strategy, which aims for climate neutral operation by 2030. Like other new Equinix builds in Germany, MU4 will have a green façade and partially planted roof. The greenery acts as additional natural insulation and cooling, also ensuring the building blends into the cityscape.

Furthermore, the next construction phase of the data centre is due to see the installation of an Aquifer thermal energy storage system. This will enable thermal energy to be stored and recovered, and will help further optimise cooling efficiency, reducing the site's overall carbon footprint. The data centre is expected to be powered by 100 per cent renewable energy.

Kao Data expands UK data centre footprint with 16MW facility in Slough

Kao Data has announced the availability of a 16MW, carrier neutral data centre in Slough. The launch marks a new beginning for Kao Data following the recent investment of approximately £130m from Infratil and will expand its sustainable data centre platform into this globally significant data centre hub.

The build, now underway, will adhere to the high performance design, efficiency and operational blueprint of Kao Data's Harlow campus, providing customers with a Power Usage Effectiveness rating of <1.2, even at partial loads. From a sustainability standpoint, the new facility will use an ultra-efficient cooling system and be powered by 100 per cent renewable energy, with its back-up power generators powered by hydrotreated vegetable oil (HVO) from the outset.

The data centre is already set to become NVIDIA DGX-Ready Data Centre certified and OCP-Ready. It will serve the needs of high performance computing (HPC), artificial intelligence (AI) and enterprise customers.

Vantage Data Centers continues expansion in Frankfurt

Vantage Data Centers will build the second of three facilities on its flagship 55MW EU campus (FRA1) located in Offenbach, Germany, just 1km from the main data centres and peering points in Frankfurt. This facility will include 16MW of critical IT capacity and will open to customers in the first half of 2024.

In addition, Vantage has acquired full ownership of the first data centre on this campus, buying out its joint venture partners, Energieversorgung Offenbach (EVO) and DataCenter-Group (DCG). Vantage will continue in a new partnership with EVO as the energy provider and landowner of the campus.

Vantage, alongside EVO, will repurpose the waste heat from the new data centre and make it available to the local community for heating purposes. This unique initiative supports Vantage's sustainable construction goals and enables the company to make a positive impact in the region.

PROJECTS & CONTRACTS IN BRIEF

Nokia is working with Alstom to deliver a private wireless network for the National Capital Regional Transport Corporation's (NCRTC) Delhi to Meerut Regional Rapid Transit System (RRTS).

Community Fibre has doubled its network rollout target in London and will now pass 2.2 million homes and businesses by the end of 2024.

Extreme Networks has announced a multi-year partnership with Manchester United Football Club, serving as its Official Wi-Fi Network Solutions Provider and Official Wi-Fi Analytics Provider.

MLL Telecom has successfully transitioned more than 150 Portsmouth City Council sites to full fibre as part of an initial five year network services contract awarded in 2019.

Databarracks has delivered backup as a service (BaaS) and disaster recovery as a service (DRaaS) to the Royal Albert Hall.

ANT Telecom has been selected by Maidstone and Tunbridge Wells NHS Trust to help it digitise and automate the performance monitoring and uptime of critical systems. Automated internet of things (IoT) monitoring technology is being used across the estate.

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Preparing for a better life

Darren Watkins at Virtus Data Centres examines how greater efficiency and performance can deliver operational excellence

There are many articles about optimising and improving parts of the data centre – from becoming more environmentally sound by harnessing innovative cooling techniques or using renewable energy, to replacing outdated and inefficient equipment. Following the 26th UN Climate Change Conference of the Parties (COP26), the most sustainable providers are looking holistically at optimising their facilities by managing the data centre lifecycle end to end. Providers must embark on a journey from design and construction, through deployment to operation and optimisation, showing how operational excellence can be ensured and that customer needs are met.

BIGGER PICTURE

The last couple of years has shown how critical the data centre sector is to society and how dependent we are on

‘As data centres move up the agenda in terms of their recognition as business critical infrastructure, organisations are increasingly looking for a safe pair of hands – partners with years of proven operational excellence.’

this seemingly invisible infrastructure that powers the digital economy and, more recently, hybrid working. But even before then, the colocation market across Europe and the rest of the world had been growing at speed, fuelled by the increasing appetite for all things digital.

As data centres move up the agenda in terms of their recognition as business critical infrastructure, organisations are increasingly looking for a safe pair of hands – partners with years of proven operational excellence. As Albert Einstein once said, ‘The only source of knowledge is experience.’ Only experienced providers can help businesses navigate the ever changing and demanding landscape. Operators continue to strive to be more effective, efficient and environmentally responsible. Businesses need to make sure they choose a partner that has a solid track record in delivering service efficiency.

FIRST THINGS FIRST

The first consideration for data centre operators is likely to be location. In theory, a data centre can be built almost anywhere with enough power and the right connectivity, but location has an impact on the quality of service it can provide to its customers. When it comes to design and construction, there are plenty of things to think about such as materials, time to market and cost. But it’s not just about quick and efficient builds – innovative data centre designs are a way to stay ahead of the market, pushing standards forward.

Today, innovation must be aligned with ongoing sustainability and it’s here where the Building Research Establishment Environmental Assessment Method (BREEAM) is important. This set of standards looks at the green credentials of commercial buildings, verifying their performance and comparing them against sustainability benchmarks across the entire project lifecycle. Organisations should look at these kinds of credentials in their providers – are the facilities rated BREEAM ‘Excellent’ or similar?

Some innovative designs include water sourced from a natural underground aquifer to minimise mains water usage, air flooded data halls that use hot aisle containment and which are cooled using indirect evaporative air technology providing cooling, rainwater

harvesting and reuse of heat waste. But it doesn't end with design. Once a building is up and running there are other things that can be done – simply recycling waste can make a difference. What recycling targets does your provider have in place?

OPERATION AND OPTIMISATION

Crucial to efficiency and performance are power and cooling, as they are intertwined and account for a major chunk of the operating costs of a data centre. In terms of power requirements, data centres are particularly well placed to benefit from renewable energy sources due to their stable power consumption.

Uninterruptible power supply (UPS) selection will be determined by several factors including the criticality of the systems under load, the quality of the existing power supply and, of course, cost. When it comes to energy use, is your provider using 100 per cent renewable sources, not carbon zero energy? Is it helping you to meet environmental goals whilst also providing cost savings and increasing reliability?

Cooling systems currently account for around 40 per cent of data centre energy consumption. Liquid cooling has fast made a comeback as a way of maintaining optimal operating temperatures, notably in the high performance computing (HPC) arena, together with innovative techniques such as low energy indirect evaporative air solutions. This system works by drawing outside air through louvres on the side of the data centre and cooling hotter air from the data hall via a heat exchanger, before returning it as cool supply air. What solution is your provider using and how efficient is it?

MADE TO MEASURE

A way to measure optimisation is to use key performance indicators. 100 per cent availability is expected without exception, since the IT loads supported by data centres are mission critical and the impact and cost of downtime is high – not just for the providers, but for all businesses.

Scalability is equally vital for performance, as customers look to operators to provide more or less space, as and when required. Other performance metrics to consider are how energy efficient a data centre is, what its Power Usage Effectiveness (PUE) rating is, how cost effective it is in terms of capital and operational expenditure, its total cost of ownership, and how sustainable and environmentally compliant its design is. More critical resources are increasingly being measured, such as Water Usage Efficiency (WUE) and reporting the reduction of carbon emissions.

These metrics are becoming more of a requirement, as many organisations are regularly asking providers for evidence of robust sustainability and carbon reduction measures for their own corporate social responsibility based commitments. What performance indicators does your data centre use to demonstrate ongoing improvements in optimisation?

LEADING BY EXAMPLE

Operational excellence is where the truly great data centre providers lead. There are some design innovations that can make a difference in terms of efficiency and robustness but, in the main, the core infrastructure parts are pretty similar within every data centre worldwide. The difference lies in how you design, build, test, maintain, change and operate a facility. Inevitably, things will break. However, it's how your provider plans for these incidents, and the response to check and test that all is restored and working effectively, which makes the critical difference. A data centre needs to be designed, built and operated by people who have had many years doing the job and know what to look out for. And this is where experience is key. ■

DARREN WATKINS

Darren Watkins is managing director at Virtus Data Centres. He began his career as a graduate military officer in the Royal Air Force before moving into the commercial sector. He brings over 20 years of experience in telecommunications and managed services gained at BT, MFS Worldcom, Level3 Communications, Attenda and Colt. He joined Virtus from euNetworks, where he led market changing deals with a number of large financial institutions and media agencies.

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