

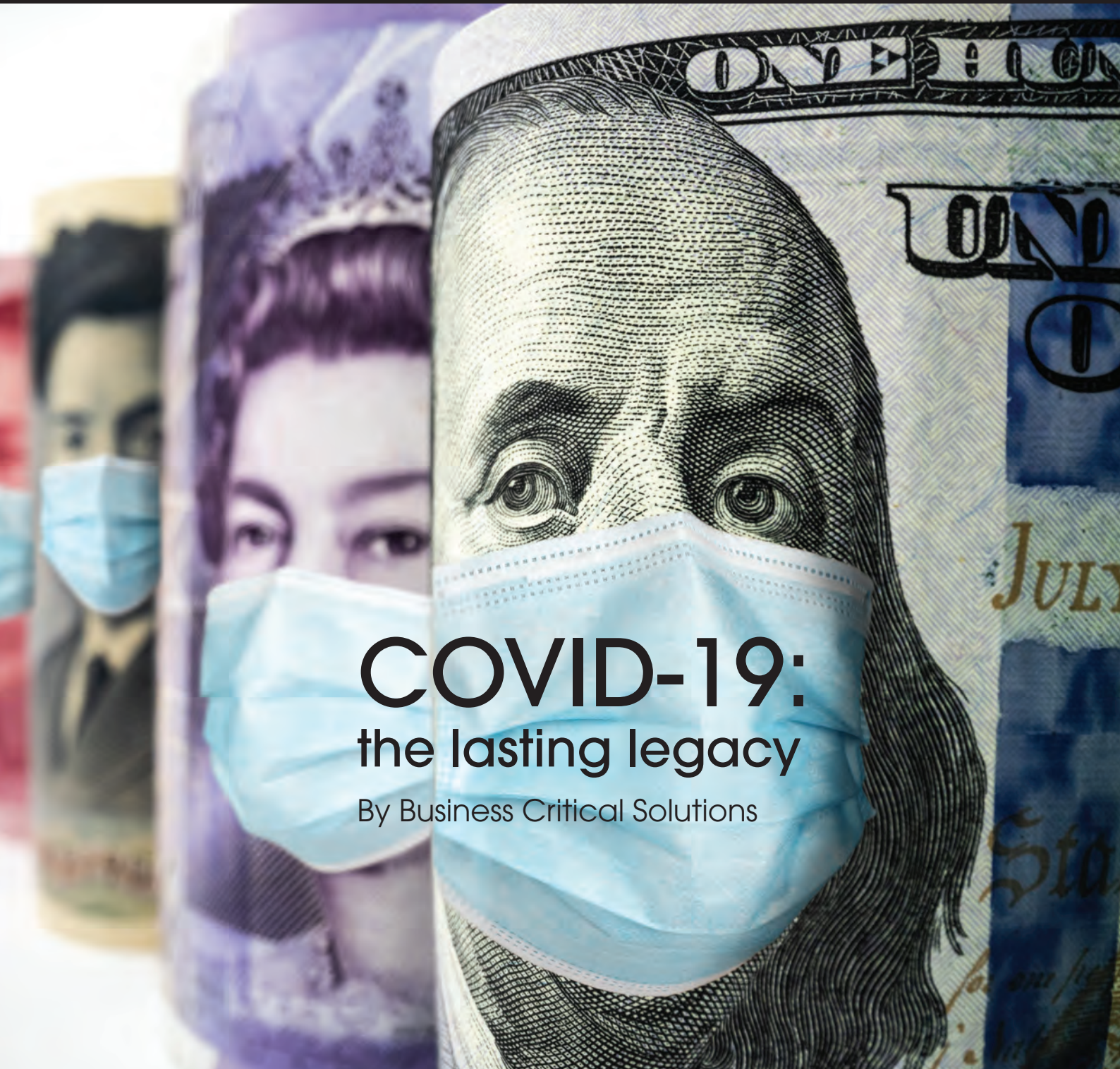


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ISSUE I 2021

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COVID-19: the lasting legacy

By Business Critical Solutions

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Editor's View

By Phil Alsop



Turning the temperature up on data centre sustainability

VARIOUS CONVERSATIONS I've had with data centre professionals in recent weeks convince me that, for all the great energy efficiency and wider environmental progress being made by many organisations in the sector, there's still a large quantity of legacy facilities which are, how shall we put it, nearer the bottom than the top of the sustainability class. I'd be fairly confident that most, if not all, of them are not just aware of green issues and pressures, but wanting to play their part.

What counts against them is a combination of ageing buildings and infrastructure, with no obvious modernisation programme which doesn't involve significant investment. And even if money is no object, is it best spent on environmental 'window-dressing' of existing, inefficient data centres, or on some new buildings, complete with the very latest cooling, power, cabinets, cabling, lighting and fire suppression solutions?

Before the data centre industry as a whole embarks on a major sustainability drive guaranteed to produce major, positive changes, there's no doubt that a better picture of what is, or isn't, going on in the current global data centre population is all but essential. After all, data centre owners and operators are only too aware of the need to measure and monitor data centre infrastructure to better understand its performance and how it can be improved. How then are we to expect the industry as a whole to make meaningful, measurable sustainability progress if we don't have accurate information as to what's going on right now?

And I can confirm from personal research that figures about the data centre industry vary wildly from the actual number of data centres which exist in the world (much depends on



the definition of a data centre), to the amount of power they consume (again, this definition can vary). We might find that the data centre industry is not such a bad performer when it comes to energy efficiency and the environment. Then again, the situation might be worse than anyone can imagine.

Until such time as the industry has trustworthy numbers on which to base any future action, there's no real knowing what's been achieved to date in both relative and absolute terms, or what's required in the future. No business would survive long without such intelligence, and yet the data centre industry is expected to 'muddle along' making a whole series of sustainability best guesses!



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COVID-19: The lasting legacy

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Businesses accelerate digital technology implementation for 2021

HCL TECHNOLOGIES has issued findings on digital technology investment and deployment by enterprises in the wake of COVID-19. The Digital Acceleration for Business Resilience report, done in conjunction with Vanson Bourne, surveyed 420 senior business and IT decision makers across industries and found the majority of companies (89%) are stepping up their digital initiatives, which the report terms "Digital Acceleration." The respondents state cybersecurity and cloud are the top two technologies to receive increased investment as a direct result of the pandemic.

The report also reveals three key actions business leaders must take to realize the benefits of digital acceleration for their organizations and customers.

These steps include the reprioritization of digital investments and shortening of implementation cycles, inspecting and reworking business architecture for operational agility, and auditing the partner ecosystem to ensure their companies have the right external expertise. While these actions are necessary for companies around the globe, the data also shows they must be uniquely designed and deployed for individual industries.

Digital acceleration is pushing business leaders to turn their three-year roadmap for digital transformation into an iterative implementation that can promote long-term changes to stay competitive and support business and customer needs. From budgeting for new, adaptable innovations that foster enterprise agility to building strategic partner ecosystems, it's clear that decision makers are taking action to stay competitive in the current landscape.

COVID-19 Has Shifted Boards' Focus to Digital Investment

A notable finding of the survey is a major increase in reported board-level focus on digital transformation pre-pandemic to today, jumping from 42% at the start of 2020 to 55% currently. As the pandemic situation evolves, this number is expected

to keep rising. Additionally, those industries that started 2020 at the bottom in terms of board-level digital focus have reported the greatest increases throughout the year, closing the gap and representing a leveling of digital investment focus across industries. The survey also shows 88% of organizations already have a formal digital transformation strategy in place, and 57% have a tactical roadmap to follow, making next-generation implementations under digital acceleration vital for resilience.

Architecture Agility Empowers Business Stability

The pandemic has disrupted business globally, with 62% of organizations reporting a negatively disrupted supply chain and 90% reporting a change in demand (either positive or negative). The takeaway is a need for greater flexibility built into business process and technology architecture to respond to uncertain environments now and in the future.

For large and complex legacy organizations, the inability to quickly adapt and test business models in an iterative fashion poses a critical challenge to transformation. An increased focus on next-gen technologies such as cybersecurity and cloud are necessary for future-proofing today's enterprises.

COVID Highlights the Importance of a Strategic Partner Ecosystem

Business leaders are well aware that today's business ecosystem extends beyond their individual organization. The survey reveals 45% of respondents use a partner ecosystem to execute their enterprise digital transformation and 48% report external partners playing a role in defining their transformation strategy.

Additional findings from the survey include:

- Respondents state the top three barriers to digital transformation are data security/governance (40%), legacy technology (35%), and lack of internal skills (35%)
- More than half (58%) of respondents report they have created new in-house teams to execute digital transformation, while only a slightly smaller proportion (55%) are executing within business units
- 70% of organizations with a robust data strategy provide a consistent omnichannel customer experience, vs 27% of organizations with incomplete or nonexistent data strategies

The full report includes comprehensive data on the key technology investment areas, utilization metrics of digital capabilities and technologies, and barriers to digital transformation success.



European data centre market prepares for record take-up and supply growth

THE FLAP MARKET will see more than 415MW of new supply added in 2021. This is almost 100MW more than the last highest performing year of 2019. The market will surpass 2,200 MW of supply. The European carrier-neutral data centre markets are scheduled to see record amounts of supply and take-up in 2021, with high rates of growth expected to last into 2022 and 2023.

CBRE's forecasts, based on FLAP (Frankfurt, London, Amsterdam and Paris) market activity, show that cloud currently accounts for 80% of market demand. Hyperscale cloud providers will continue to be the main consumers of data centre supply over the coming three years, accounting for a high proportion of wholesale colocation deals.

Enterprises and other service providers will encourage growth across the retail colocation market as they look to transform IT environments post COVID-19.

The FLAP market will see more than 415MW of new supply added in 2021. This is almost 100MW more than the last highest performing year of 2019. The market will surpass 2,200 MW of supply. We also expect to see 370MW of take-up, more than 230MW of which has already been signed as pre-lets. The market signed 440MW of new contracts in 2020 – more than half of these will be realised in future years. Penny Madsen-Jones, Director of EMEA Data Centre Research



at CBRE, said such high activity follows 2020, when the market surpassed its original forecast made in Q1, 2020 (prior to COVID-19) to record more than 200MW of new take-up.

"It is remarkable that the data centre market, which has faced supply challenges, has been able to meet continued high demand. Constraints have ultimately led more customers – in particular hyperscale customers – to carefully consider their data centre needs for the years ahead, and this has led to high pre-let activity. This provides CBRE with amazing insight into take-up for the years ahead," Madsen-Jones said. "Much of the pre-let activity we have seen

has been focused around existing cloud availability zones. We will see even more such activity as the build-to-suit market (which builds specifically to hyperscale specifications) grows.

"Many markets, however, will continue to experience challenges site access and power in where cloud availability zones exist, and we expect, as a result, to see new availability zones formed across existing markets in coming years, leading to continued high demand." During 2020, 173MW of supply was added across the FLAP markets, which saw 201MW of take-up. The markets currently operate with a vacancy rate of 19%, down from 21% a year ago.

 THE DATA ACCELERATION COMPANY	 DCS AWARDS Best Data Centre ICT Networking Product of the year	 UK IT INDUSTRY AWARDS UK IT Industry Award	 SME news Innovation in Software Defined Protocol Acceleration
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BRIDGEWORKS WINS 6 AWARDS 2020

Research shows data centre sector is overlooking a potential CO₂-eq emissions saving of over three million tonnes

EKKOSENSE analysis indicates that organizations are missing an opportunity to cut their data center cooling energy consumption by 30%.

New research analyzing the actual cooling performance within live data centers for many of the world's leading brands suggests that data center operators are missing out on proven ways of cutting cooling energy consumption by up to 30%.

The analysis, conducted by EkkoSense assessed cooling performance across a sample of some 133 data center halls with analysis of over 33,000 IT racks. The results showed that the current average data center cooling utilization level is only 40%.

EkkoSense's research also identified that implementing an effective thermal optimisation programme has collectively secured a cumulative 10MW+ cooling power saving - equivalent to a minimum \$10 million cooling energy cost saving since deployment. In carbon terms, this equates to a cumulative saving of around 20,000 tonnes CO₂eq emissions reduction[i].

This level of performance optimization applied to the broader global estate of 22,474 midsize, enterprise and larger hyperscale data centers[ii] suggests that potential worldwide cooling energy savings of over \$1.7 billion are realizable. Additionally, an overall carbon emissions reduction of some 3.38 million tonnes CO₂-eq worldwide can be secured simply by applying the systematic and synchronized application of data center cooling optimisation best practices on a global basis.

"With data centers already established as one of the world's highest collective consumers of energy, it's imperative that IT operations teams do everything they can to deliver the quick carbon reduction wins that will help organisations to deliver on their net zero commitments," commented Mark Acton, a leading

data center technical and standards consultant and an EkkoSense Non-Executive Director.

"The good news is that with the latest generation of software-driven data centre optimization solutions there's a real opportunity for organisations to achieve significant carbon reductions.

"Indeed, EkkoSense's in-depth analysis of data center thermal performance shows that it's now possible to secure cooling energy consumption reductions of around a third simply by following current thermal optimization best practices".

"Data center operators also need to recognise that optimizing thermal performance positively impacts data center risk management – however it's difficult to ask the right questions if you don't actually have any granular visibility into how your individual racks and cooling equipment are performing," added Anuraag Saxena, Data Center Optimisation Manager at EkkoSense.

"From our research we know that

only 5% of data center M&E teams currently monitor and report equipment temperature actively on an individual rack-by-rack basis - and even less collect real-time cooling duty information or conduct any formal cooling resilience tests. So, it's perhaps hardly surprising that our initial analysis showed that – at any given time - around 10-15% of data center racks were actually well out of ASHRAE thermal compliance."

Given that the typical response of many organisations facing IT cooling challenges is to further invest in more expensive cooling equipment, EkkoSense's findings show that the underlying cause of poor data center thermal compliance is clearly not a lack of cooling capacity.

Instead, facility teams and other technical stakeholders should be focused on optimizing their data centers' thermal performance and using their investment in existing cooling systems more efficiently. This not only results in reduced cooling costs year-on-year but also eliminates, or defers, the need for capital investment.



In, out when it comes to cloud?

ANALYSTS REPORT that over 20% of enterprise applications have been moved from on-site data centers to the public cloud. A recent Virtana survey of IT decision makers revealed that most enterprises (95%) say they have moved some applications to the cloud, but not without difficulty. Seventy-two percent (72%) of the enterprises surveyed had to move one or more of their migrated applications or workloads back on-premises.

Top reasons for this move back, as cited by respondents, were that:

- The applications should not have been moved to a public cloud in the first place (41%)
- Technical issues associated with public cloud provisioning (36%)
- Degradation of performance (29%)
- Unexpected cloud costs (20%)

The survey of 350 IT decision makers in the United States and United Kingdom was commissioned by Virtana and fielded by Arlington Research in November 2020. The high rate of repatriation, and the stated reasons for it, point to the complex challenges some organisations face during cloud migration. More specifically, complexities around which applications to migrate, lack of visibility into application dependencies, and understanding how workloads will behave in the public cloud once they are migrated.

"Virtana's latest survey highlights an issue IT organisations are coming across a lot, regardless of where they are in their cloud journey," stated Paul Bevan, Research Director of IT Infrastructure for Bloor Research. "In the drive to



implement cloud-first, or cloud only strategies, many are stumbling over migrations and have had to repatriate applications back on-premises. Even cloud-native organisations are now having to focus on getting their multi-cloud strategy optimised.

However we look at it, the cloud comes with its own challenges for everyone. Taking a 'know before you go' approach to the cloud is really a fundamental underpinning to a successful cloud implementation."

The survey also found that despite the challenges, IT decision makers consider public cloud initiatives of strategic importance to their organisations and many are more committed to them than ever. Key findings include:

- More than two-thirds (68%) of respondents have already migrated 25% or more of their applications to public clouds (supporting analyst findings that 20% of apps have migrated)

- In addition, even in the current economic climate, 78% of companies are investing in public clouds at the same or an accelerated pace.
- Further, multi-cloud environments are the norm, with 81% of respondents reporting that they are using more than one public cloud provider.

"With a strong confidence in public clouds going forward, and so many organisations getting public clouds wrong the first time, it is clear that organisations need greater observability into application behaviors, interdependencies, and public cloud costs before they make a move to the cloud," said Kash Shaikh, President and CEO of Virtana. "We are on a mission for enterprises to 'Know Before They Go' with a data-driven approach that yields actionable insights. Our decade of observability and monitoring on-premises to multi-cloud environments removes the hard work of migrating to the cloud and keeps it simple once applications and workloads are moved."

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Microsoft, Amazon and Google dominate hyperscale market

NEW DATA from Synergy Research Group shows that the total number of large data centers operated by hyperscale providers increased to 597 at the end of 2020, having more than doubled since the end of 2015.

In terms of location, the US continues to account for almost 40% of the major cloud and internet data center sites. The next most popular locations are China, Japan, Germany, the UK and Australia, which collectively account for another 29% of the total. Over the last four quarters new data centers were opened in 17 different countries, with the US, South Korea, China, Canada, UAE, Indonesia, Italy and South Africa having the largest number of additions. Among the hyperscale operators, Amazon, Microsoft and Google collectively account for over half of all major data centers.

Amazon and Google opened the most new data centers in the last twelve months, accounting for half of the 2020 additions, with Oracle, Microsoft, Alibaba

and Facebook also being particularly active. Synergy research indicates that over 70% of all hyperscale data centers are located in facilities that are leased from data center operators or are owned by partners of the hyperscale operators.

The research is based on an analysis of the data center footprint of 20 of the world's major cloud and internet service firms, including the largest operators in SaaS, IaaS, PaaS, search, social networking, e-commerce and gaming.

The companies with the broadest data center footprint are the leading cloud providers – Amazon, Microsoft, Google and IBM. Each has 60 or more data center locations with at least three in each of the four regions – North America, APAC, EMEA and Latin America. Oracle and Alibaba also have a notably broad data center presence. The remaining firms tend to have their data centers focused primarily in either the US (Apple, Facebook, Twitter, eBay) or China (Tencent, Baidu, JD.com).



“There were 111 new hyperscale data centers opened in the last eight quarters, with 52 of those coming onstream in 2020 despite COVID-19 causing a few logistical issues,” said John Dinsdale, a Chief Analyst at Synergy Research Group. “That is testament to the ongoing robust growth in the digital services that are driving those investments – particularly cloud computing, SaaS, e-commerce, gaming and video services. We did actually see a handful of older hyperscale data centers shut down in 2020, but those numbers pale besides the number of newly opened or planned sites. In addition to almost 600 operational data centers, we have visibility of a further 219 that are at various stages of planning or building, which is good news indeed for data center hardware vendors and wholesale data center operators.”

Climate Neutral Data Centre Pact commits to ambitious sustainability action

TWENTY-FIVE COMPANIES and seventeen associations from across Europe agree to take specific steps to make data centres climate neutral by 2030.

One year after the adoption of the European Green Deal, leading cloud infrastructure providers and data centre operators have created the Climate Neutral Data Centre Pact. Twenty-five companies and 17 associations have agreed to a Self Regulatory Initiative to make data centres in Europe climate neutral by 2030.

Companies joining the Pact represent the most significant industry players in cloud infrastructure and data centres in Europe. This is an historic and unprecedented commitment by an industry to proactively lead the transition to a climate neutral economy. Frans Timmermans, European Commission Executive Vice-President

for the European Green Deal: “Citizens across Europe use ever more technology to go about their daily lives and want this technology, also to help secure a sustainable future for people and planet. Today’s pledge from important parts of the data industry constitutes a promise to society and offers a welcome first step towards achieving our common ambitions for a smart and sustainable future.”

Alban Schmutz, Chairman of CISPE (Cloud Infrastructure Services Providers in Europe): “With cloud infrastructure the backbone of the European Union’s digital economy, our industry is committed to the idea that we must all play a central role in addressing climate change. This commitment underpins a roadmap for Europe’s cloud infrastructure industry to offer climate neutral services to customers by 2030.” Apostolos Kakkos, Chairman of EUDCA

(European Data Centre Association): “Data centres are the supporting pillars of the fourth industrial revolution and, as seen during the COVID-19 pandemic, are essential infrastructure of not only the digital economy but of the entire global economy. It is our duty to commit to a self-regulatory initiative that will help to ensure the operational availability, sustainability and the future of our industry.”

The Climate Neutral Data Centre Pact establishes a Self Regulatory Initiative which has been developed in cooperation with the European Commission.

It supports both the European Green Deal, which aims to make Europe the world’s first climate neutral continent by 2050, and the European Data Strategy by making EU data centres climate neutral by 2030.

Report reveals data centre staffing challenge

UPTIME INSTITUTE has published its Global Data Center Staffing Forecast 2021-2025, the digital infrastructure industry's first comprehensive forecast of workforce needs – by region, by data center type, and by staff minimum education requirements.

In every geographic region, data center capacity is dramatically expanding in a build-out of historic proportions. That requires people – to design, build and operate data centers. The availability (or lack) of specialist staff will be an increasing concern for all types of data centers, from mega-growth hyperscales to small, private enterprise facilities.

By quantifying demand, this research will help raise awareness of the strong employment opportunities for job seekers and give employers, education institutions, and governments a way to measure the need for investment in workforce training and education.

Data center staff requirements are forecast to grow globally from about 2 million full-time employees in 2019 to nearly 2.3 million by 2025. Most demand is expected in the Asia-Pacific region, followed by North America, Europe, Middle East, and Africa. In the large and mature data center markets of the U.S. and Western Europe, there is concern that many employees are due to retire about the same time, causing an additional surge in demand, especially for senior roles. This “silver tsunami” effect may last for the coming decade.

“This study helps us as an industry better understand the size and scope



of the staffing challenge,” said Rhonda Ascierio, vice president of research, Uptime Institute. “It is also a quantitative assessment of the long-term career opportunities available. This is a fast-growing and dynamic industry – and we need people from all backgrounds, all over the world.”

Historic Growth of Demand:

- Demand growth will mainly come from cloud and colocation data centers. Cloud data centers – either owned or leased by cloud/internet companies – will require the most staff, by a significant margin.
- Enterprise data centers are expected to continue to employ many staff, although the cloud workforce will surpass enterprise after 2025.

Staffing Requirements:

- Most positions will require either a university/college or technical trade school degree or – critically – equivalent experience that can be

substituted for a formal education. Employers should reevaluate their current job requirements to attract a wider pool of diverse talent.

- More education and training, including on-the-job, will be key to meeting future demand.
- Technical staff are notoriously difficult to recruit for data centers.

Mechanical and electrical engineers in strategy and operations roles, and all types of controls and monitoring employees, are among the technical staff that will be increasingly needed through (at least) 2025.

To create the forecast, Uptime Institute Intelligence estimated demand for more than 230 specialist job roles (organized into nine job domains) needed to design, build, and operate data centers. Estimates are based on industry input and extensive expert advice from across Uptime Institute.

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Cloud cuts out carbon dioxide

Cloud computing could eliminate a billion metric tons of CO₂ emissions over the next four years, and possibly more.

A NEW FORECAST from International Data Corporation (IDC) shows that the continued adoption of cloud computing could prevent the emission of more than 1 billion metric tons of carbon dioxide (CO₂) from 2021 through 2024.

The forecast uses IDC data on server distribution and cloud and on-premises software use along with third-party information on datacenter power usage, carbon dioxide (CO₂) emissions per

kilowatt-hour, and emission comparisons of cloud and non-cloud datacenters.

A key factor in reducing the CO₂ emissions associated with cloud computing comes from the greater efficiency of aggregated compute resources. The emissions reductions are driven by the aggregation of computation from discrete enterprise datacenters to larger-scale centers that can more efficiently manage power capacity, optimize cooling, leverage the most power-efficient servers, and increase server utilization rates.

At the same time, the magnitude of savings changes based on the degree to which a kilowatt of power generates CO₂, and this varies widely from region to region and country to country. Given this, it is not surprising that the greatest opportunity to eliminate CO₂ by migrating to cloud datacenters comes in the regions with higher values of CO₂ emitted per kilowatt-hour.

The Asia/Pacific region, which utilizes coal for much of its' power generation, is expected to account for more than half the CO₂ emissions savings over the next four years. Meanwhile EMEA will deliver about 10% of the savings, largely due to its use of power sources with lower CO₂ emissions per kilowatt-hour.

While shifting to cleaner sources of energy is very important to lowering



The idea of 'green IT' has been around now for years, but the direct impact of hyperscale computing can have on CO₂ emissions is getting increased notice from customers, regulators, and investors and it's starting to factor into buying decisions

emissions, reducing wasted energy use will also play a critical role. Cloud datacenters are doing this through optimizing the physical environment and reducing the amount of energy spent to cool the datacenter environment. The goal of an efficient datacenter is to have more energy spent on running the IT equipment than cooling the environment where the equipment resides.

Another capability of cloud computing that can be used to lower CO₂ emissions is the ability to shift workloads to any location around the globe. Developed to deliver IT service wherever it is needed, this capability also enables workloads to be shifted to enable greater use of renewable resources, such as wind and solar power.

IDC's forecast includes upper and lower bounds for the estimated reduction in emissions. If the percentage of green cloud datacenters today stays where it is, just the migration to cloud itself could save 629 million metric tons over the four-year time period. If all datacenters in use in 2024 were designed for sustainability, then 1.6 billion metric tons could be saved. IDC's projection of more than 1 billion metric tons is based on the assumption that 60% of datacenters will adopt the technology and processes underlying more sustainable "smarter" datacenters by 2024.

"The idea of 'green IT' has been around now for years, but the direct impact of hyperscale computing can have on CO₂ emissions is getting increased notice



from customers, regulators, and investors and it's starting to factor into buying decisions," said Cushing Anderson, program vice president at IDC. "For some, going 'carbon neutral' will be achieved using carbon offsets, but designing datacenters from the ground up to be carbon neutral will be the real measure of contribution. And for advanced cloud providers, matching workloads with renewable energy availability will further accelerate their sustainability goals."



Executive Insights...

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Acceleration of remote monitoring

How can solution providers fully support their data centre customers with challenges to deploy faster?

Remote monitoring of IT room environments is becoming a key requirement for data centres to adapt to unexpected conditions.

Datacentre UK's Technical Director Paul Almond shares his observations on the rise of cloud and hybrid solutions on Executive Insights.

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Meeting the demand for digital transformation

As digitization accelerates, how can the industry increase support for IT and engineering professionals amid a growing skills shortage?

BY MARC GARNER, VP, SECURE POWER DIVISION, SCHNEIDER ELECTRIC UK&I



TODAY the pressure placed on frontline workers in the face of the third UK lockdown has been unprecedented. According to an article published by the NHS in October 2020, mental health problems are one of the main reasons for staff absences, with data showing that anxiety, stress and other related illnesses accounted for 28.3 percent of all sickness leave in May 2020.

New UK government laws to try and reduce the impact of the Coronavirus pandemic, ease stress on the NHS, and protect both the UK public and healthcare professionals from the disease have been implemented nationally. And while lockdowns have required many businesses to close and staff to work remotely, in the new normal, technology has quickly become the go-to means of supporting the economy.

Digital demands are growing

Amid growing demands for accelerated digital transformation, continuity for business and mission-critical applications have become key concerns for IT professionals. So much so that in 2020, data centre employees were named key workers, fundamentally elevating the status of the industry and increasing

the criticality of its role within the digital economy. According to IDC, Digital Transformation (DX) investment is growing at a compound annual growth rate (CAGR) of 15.5 percent from 2020 to 2023, and is expected to approach \$6.8 trillion (£4.8T). Indeed as more organisations become dependent on digital infrastructure the pace of digitization shows no sign of slowing.

The pressure to ensure uptime, therefore, has placed greater stress not only on the networks, power and IT infrastructure underpinning the sectors reliant on them – those that include healthcare, education, and business - but on the professionals who support them. Such stress has been prevalent within tech for years and according to a survey by Regus in 2015, 49 percent of IT workers said they were closer to burnout at that time than during the five years previous.

Fast-forward to 2020 and a survey by Blind revealed that 57 percent of respondents answered 'yes' when asked if they were suffering from burnout, while a 2020 survey from Harvey Nash Group also found over one in three tech professionals say their mental health had deteriorated during the Covid-19 pandemic. Looking forward, CBRE predicts a 400MW surge in capacity that offers strong positive outlook for the data centre sector. Yet other pressures are placing great strain on industry professionals who are tasked with keeping the lights on at all times - not least of which are the out-dated infrastructure systems and networks picking up the increased demand.

The need to prevent downtime According to the Uptime Institute's 10th annual-data centre survey, "outages are occurring with disturbing frequency and are becoming more damaging and expensive." In fact, one third of survey participants admitted to experiencing a major outage in the last 12 months and one in six claimed it had cost them more than \$1m (£730K). According to the 2017 Centrica Resilience



Report 39 percent of businesses also experienced unscheduled downtime as a result of an energy-related failure. Interestingly 75 percent of Uptime respondents also cited that downtime could have been prevented with better management, processes or configuration, meaning a proactive or well rounded approach to maintenance might have ensured peace of mind and mitigated any unforeseen issues.

Clearly resilience and business continuity have been key sector priorities for some time, but how do we begin to address such growing needs when the sector itself is experiencing an endemic skills shortage? And while experienced engineers and consultants continue to work tirelessly, is there a way we can use tech to help reduce stress or avoid downtime remotely?

Addressing the skills gap

According to the UK Government's Review of the shortage occupation list 2020, an insufficient supply of adequate skills and experience, and an ageing workforce are two key reasons for skills shortages in the IT and engineering sectors. Moreover, 30 percent of full-time, working age employees in this group were over 50, compared with 32 percent across other occupations. Needless to say that when it comes to digital infrastructure, experience within the sector is paramount, but are businesses doing enough to attract new skills into the industry? Methods that some employers have found to be 'effective' include increasing salaries, expanding training in their existing workforce and within their trainee and apprenticeship programmes.

Indeed many members of the electrical, IT and channel communities have already taken advantage of new government incentives around kick-starting and apprenticeships, hoping to attract and employ new members of staff into IT and engineering. Yet some have also begun to transform their organisations with new diversified service models that support end user demands.

Partner expertise is paramount

What's become apparent is that having access to an expert digital ecosystem is essential for customer uptime, especially when we look at the growing demands placed on critical infrastructure. IDC states that by 2025, 75 percent of business leaders will leverage digital platforms and ecosystem capabilities to adapt their value chains to new markets and industries, meaning the role of technology partners is becoming increasingly important.

In many cases, service providers are beginning to bridge the skills gap, using their expertise, their position with vendors and digital technologies to support customers seeking to mitigate the impacts of downtime. Such services might include remote monitoring, on-site troubleshooting and next-day replacement parts for mission-critical applications, where an outage will have a direct effect on



profitability or customers. One barrier to this approach has previously been cost. However, research detailed in Schneider Electric white paper #283 found that the savings gained by using a partner or service provider increase substantially as equipment ages. With a fleet of 100 Uninterruptible Power Supplies (UPS), for example, working with a service partner can offer savings of up to 59 percent under a typical managed service level agreement (SLA), demonstrating a highly cost effective way of increasing resilience.

For businesses dependent on IT uptime, access to service partners with specialisations in critical power, data centres and edge computing also offers on-demand support to help ensure reliability across distributed sites. Yet many organisations are also embracing technology as the enabler, using cloud-based software solutions to gain real-time insight into the health and status of their mission-critical infrastructure remotely.

So what's the answer?

With demands increasing at a rapid rate and growing skills gap to address, having access to expert service partners is essential for business continuity. And with the accompanying pressure to ensure IT uptime across a greater number of sites, both customers and service providers also need access to the right tools or software solutions to reduce the pressure caused by unexpected downtime.

Today Schneider Electric is helping both to minimise stress for IT Professionals and increase reliability via vendor-agnostic artificial intelligence (AI) software; delivering data-driven insights that offer visibility from anywhere, at any time. Moreover, by employing a proactive approach to maintenance or servicing, end-users could also save up to 59 percent over the lifecycle management of their IT – as compelling a business case for reducing stress, as any.



COVID-19 – the lasting legacy

The disruption to everyday life caused by the COVID-19 pandemic has been immense, with a series of radical protective measures adopted by governments to alleviate and lessen the impact of the health crisis, leading to widespread economic, living and working disruption.

BY JAMES HART, CEO AT BCS GROUP (BUSINESS CRITICAL SOLUTIONS)



IT IS AGAINST THIS BACKDROP that our latest report – Covid – the lasting legacy - reflects the views of data centre professionals spanning 38 European countries. These thoughts, reactions and opinions come from users and owners of technical real estate covering some 4.2 million square metres (45 million square feet) of technical real estate and give us some valuable insight.

There is little doubt that the pandemic has illustrated how important the data centre industry is. The growth in the use of connected devices, servicing home working and education, as well as telemedicine and the increased use of entertainment streaming services

has required considerable effort on behalf of the service and infrastructure providers. These trends, of course, were already emerging, but the impact of the pandemic has helped accelerate their implementation and acceptance. The flexibility and ability of the data centre to both innovate and respond rapidly to these dynamics has served the global economy well. However, some commentators are hypothesising that the full impact of the pandemic will not hit our industry until 2022, so what of the future?

The real impact on business

As with all sectors, for datacentre operators working and running a business during the pandemic

continues to create its own set of challenges. The requirement to deliver an efficient service maintaining uptime levels, whilst ensuring the correct safety protocols for its staff and customers generally, appears to have been accomplished. At BCS we have seen a combination of shift/split-team working, limited numbers of essential staff on site and non-essential staff working from home.

For some however this has inevitably led to a limited programme of essential work and maintenance being undertaken in these facilities during the strictest lockdown restrictions, easing as these lifted, but returning again following the second and third waves. This may have a damaging effect on longer term performance, resilience and costs.

One factor that is concerning for our respondents in the latest survey is 'difficulties with the supply chain' which was cited highly as a pain factor, with 34% placing it at the top of their list. The nature of the datacentre industry is increasingly global and securing source material for builds, fit outs, replacement parts et al is rarely just a domestic operation. The supply chain for most is international which has undoubtedly exacerbated the difficulties in securing the necessary materials as movement of people and consequently goods face continued restrictions. The concern amongst our respondents is that further disruption could well impact on the supply pipeline moving forward, with 89% reporting that they expected to see further disruptions.

Of course, differing levels of concern on this issue exist amongst our categories of respondent. For those charged with delivering new space there is almost universal agreement amongst developers, designers, engineers and construction professionals that further supply chain disruption is likely. In contrast amongst our end-users, there is a notable difference with just two-fifths expecting to see further supply chain difficulties, and most of the remainder (55%) neither agreeing nor disagreeing. This could reflect that a significant proportion of our corporate respondents are now one step away from immediate supply chain problems as they have come to rely on third-party providers more and more.

The second most highly ranked impact amongst our respondents is the increased use of remote access technologies and procedures. It is not surprising that this is as highly ranked as it is, given that in most cases only essential staff have been allowed to work on site. As a result of access to the data centre being limited to essential staff, it is also not surprising that our respondents have also cited increased workload for staff as a notable impact.

However on a more positive note another notable change over the past six months has seen loss of orders diminish as an important impact amongst respondents. In our last survey, there was perhaps

more concern as to the future direction regarding economic prospects and potential market growth which led to the postponement or cancellation of orders. Our latest survey provides a little evidence that these fears are reducing and suggest a general reappearance in real and perceived demand levels across the industry.

Impact on data centre expansion

In our previous survey, a significant proportion of respondents indicated that they were extremely cautious as to what challenges the pandemic would have on their data centre expansion plans. This was entirely understandable, as the virus took hold across the world and the consequences of lockdown, restrictions and a global halt on travel were yet unknown. Then, almost three-quarters indicated that they expected the pandemic would curtail their plans for expansion.



Encouragingly, the industry response over the course of the year appears to have introduced a level of optimism amongst respondents, with this proportion now falling to around two-fifths. A further 29% chose to adopt a wait and see position, whilst those who did not expect the pandemic to curtail their plans has risen significantly from 9% to 31%.

Whilst the balance of opinion continues to favour a negative effect on data centre expansion across Europe in the coming year, the momentum has swung significantly towards a more benign environment, one that could possibly move further into positive territory as news of multiple successful vaccines and timelines on roll-outs across the world continue.

Rising importance of location

In the face of the widening spread of the pandemic, the issue of data centre location appears to have become more important to our respondents with 64% highlighting it.

Whether the latest results are driven by actual experience amongst respondents or perceived fears

THE FUTURE

is unclear. The varying degree of lockdown and restrictions that has been seen across Europe may well have exposed some facilities to either operational or, at the very least, access challenges. Indeed, supply chains have been tested, not just around the construction and pre-fabrication routes, but also at the operational and maintenance layers.

These supply chains would also include labour, where restrictions on travel will have been felt the most. Future-proofing facilities is a THE FUTURE that has always featured high on the concerns amongst data centre owners and occupiers. Considering the experiences of 2020 and early 2021, there may well be some different metrics around the future-proofing question for our respondents to consider.



Client impact on operators

Although in general the datacentre and service providers have seemingly performed well during the months of the pandemic so far, they are not immune to the likely economic fallout. It has been widely reported that a number of sectors have been deeply impacted by falling economic activity and retail, hospitality and travel have had well publicised difficulties.

Areas of the datacentre industry that rely on these sectors for demand will undoubtedly also suffer at least in the short to medium term, although the innovative nature of service providers and product developers may well mean that opportunities for new services will fill the holes left by this falling demand. However, this has resulted in the top-rated impact that our respondents experienced with their clients being postponement of expansion plans with 57% noting this.

The next largest reported impact was the attempt to re-negotiate length of contract or lease. Just over 20% of our operators reported that clients had discussed this course of action. In addition, a further 14% have reported delayed payments. For our operator respondents, one of the major challenges they face is the potential risk to income streams via customer default. For some there is anecdotal evidence that

it has been in their interest to seek to alleviate the chances of default by acting before this occurs, either through the offer of deferred payments or even payment holidays. Notably, only 6% reported the worst-case scenario, namely clients entering administration or liquidation.

The paradigm around COVID-19 has shifted

Much has been speculated about the level of transformative impact that the COVID-19 pandemic may have – a chance for a major re-boot in the way we work, shop and play. There is plenty of copy and comment about what it means for the future of the office, commuter transport, high street retail etc. all of which will in some way impact the datacentre industry. Whatever the long-term impact of these and other substantive issues, there is little doubt that our respondents believe that there has been a significant change in underlying fundamentals and one in which their business strategies have to take into account via the ability to offer more flexible working practices. Some 89% share this view with very similar response profiles across all our respondent categories. These results suggest that in the long-term a more flexible approach to working, is likely to be more firmly entrenched in the economy. To a large extent, the data centre industry has enabled this changing dynamic through the innovative nature that is entrenched in its foundations. We have noted the growth in cloud services and their impact on our lives whether that be changes in the way we shop, learn, entertain, work or access healthcare. All of these activities are set to grow further in the future. The challenge to the data centre industry and its occupiers is to continue to provide the flexible and supportive infrastructure to meet this growth and encourage further changing requirements.

Conclusion

Following on from the pandemic there is no doubt that the digital infrastructure is more important than ever before. But lockdowns and uncertainty have seriously affected global economies, and as data centres and their occupiers are an integrated part of the global ecosystem, the sector cannot escape the effects of the downturn in global growth. A return to pre-COVID levels of confidence regarding future demand for datacentres was an encouraging finding from the latest independent industry survey.

However, when the virus eventually does leave us we will continue to face the challenges of productivity, social mobility, climate change and inequality that were already there, and that will in many cases have been exacerbated. What Covid-19 has demonstrated is the many ways in which technologies can contribute to addressing those challenges – but it is now time to treat those challenges as imperatives too and deploy these ideas at scale. Only then will we truly understand the lasting legacy for the datacentre industry and in fact the world.

Bring digital to every person, home and organization
for a fully connected, intelligent world





Why sustainability-minded enterprises need to look at emissions generated across the entire value chain

Just two years ago, in 2019, an Informa (now Omdia) study found that while data centres were using 3 percent of the world's electrical supply, on average, energy efficiency ranked fourth on IT leaders' list of priorities when building or leasing a data centre. Furthermore, most of those surveyed as part of the study did not know the power usage effectiveness (PUE) of the data centres they used.

BY TATE CANTRELL, CTO, VERNE GLOBAL



FAST FORWARD TO NOW, and sustainability is certainly top of mind. Climate change did not stop for Covid-19; the UN has reported that atmospheric CO₂ concentrations not only showed no signs of peaking last year, but that they have continued to rise to new levels. Plus, although it might not have halted climate change, one thing the pandemic did serve to do is place the data centre industry under the microscope.

Rapid digitalisation driven by remote working, remote shopping, remote socialising and so on has meant

closer scrutiny for the IT industry and in particular for data centres, being as they are a crucial component of the digital economy.

As well as a wider appreciation for the internet itself for facilitating our work and social lives while distanced from one another, there now exists a much broader understanding of just how power-intensive the IT industry is. According to some estimates, even before the pandemic began the IT industry accounted for as much as 3.7 percent of global greenhouse emissions.

Whether it's due to intensified scrutiny of their operations, or due to genuine concerns around corporate social responsibility, many companies are publicly committing to cut their carbon emissions and improve the overall environmental friendliness of their operations. For example, Apple has committed to making its supply chain carbon-neutral by 2030. The key thing to note about Apple's promise is that it refers to its entire supply chain. This means that Apple will need to measure the carbon emissions generated by its entire value chain, not just from within the walls of the company itself.

In order to ascertain how to decrease and mitigate the effects of their carbon emissions, enterprises need a standardised method of measuring their carbon emissions. The Greenhouse Gas Protocol (GHGP) supplies the most widely recognised international accounting and reporting standards for greenhouse gases. It sets out the emissions generated by a companies' operations into three 'scopes', all of which contribute to a business's overall carbon footprint.

- **Scope 1** indicates all emissions generated directly from owned or controlled sources
- **Scope 2** emissions are those indirectly generated from energy purchased by the company.
- **Scope 3** emissions refers to all other indirect emissions.

This means emissions generated by all activities not owned or controlled by the reporting organisation, but that the company indirectly impacts in its value chain. Many companies don't count on finding that the majority of greenhouse gases occur outside of the four walls from where they conduct their business but in fact, it is these indirect emissions that are the most important to consider when looking at reducing a carbon footprint. And crucially, this group includes those emissions produced by externally hosted high performance computing.

As soon as a company passes on computing to an external data centre, the emissions generated by that activity become Scope 3 emissions. It is for this reason that companies looking to improve the environmental friendliness of their operations have to ensure they place their particularly power-intensive data centre operations under the microscope. As an example of how power-hungry HPC can be, the carbon emissions released each day by the ICON weather forecasting algorithm is over 2.3 million gCO₂e, equivalent to flying from New York to San Francisco four times (per 2020 University of Cambridge research).

On a positive note, energy efficiency in data centres is increasing at a rapid rate. The IEA reports that energy consumption has remained flat for the past three years, while – as we know – workloads and internet traffic have grown rapidly. Since most of the low-hanging fruit in the area of data centre efficiency has already been picked – such as better airflow



management strategies for more efficient cooling and increased server virtualisation to reduce electricity consumption – it will continue to be more challenging to be able to offset the increase in ICT workloads with gains in energy efficiency alone. As a result, we do expect that ever-greater computing workloads will cause the IEA reports to show an upsurge in energy consumption in the years to come. Therefore, the only obvious way to realise the benefits of computing growth in a truly sustainable manner is to match the rise in ICT workload energy with a corresponding increase in the usage of renewable energy sources – particularly with respect to HPC, which is one of the largest areas of growth in the ICT sector.

The good news for companies looking for data centres to host their HPC is that advances in renewable energy such as microgrids and power purchase agreements (PPAs) means that it's now a viable and comprehensive option for powering HPC. As 80 percent of all hardware does not need to be placed near the end-user with regards to latency and accessibility, enterprises can choose to locate their HPC somewhere that has access to abundant renewable energy. Plus, data centres that source their energy from a resilient grid powered by renewable sources can have very predictable energy costs. For example, foreign companies using electronically-provided services in Iceland can be offered an electricity tariff by a data centre provider that is fixed for 10 years or more, which also allows for long-term financial planning. These fixed costs mean enterprises don't need to choose between profitability and sustainability when it comes to HPC.

Locating HPC where it can be powered by renewable energy is not only viable, but an attractive, cost-effective option for enterprises looking to implement truly sustainable practices across their operations. With ever-growing attention being paid to GHG emissions across the entire enterprise value chain, it certainly seems that the time for organisations to commit to sustainable HPC has come, or else risk being left behind.

As the global SaaS market surges – who pays for the energy to power it?

Who accounts for the economic and carbon cost of SaaS data centre power? And can it be brought under control?

BY ED ANSETT, CO-FOUNDER AND CHAIRMAN OF THE I₃ SOLUTIONS GROUP



FEW CONSUMERS think about the electricity that powers their applications. But for the enterprise sector, whose reliance on SaaS is growing, this is not something that can be ignored.

That leaves many questions. How is the energy use and cost being priced into the services such as SaaS? Are SaaS providers paying too much for power? SaaS providers are focused on cost per transaction;

meaning this becomes a question for the data centre operator. Should SaaS providers demand energy cost transparency and that data centre power provision be more flexible and adaptable?

SaaS Power

The figures below reveal there is little doubt that SaaS is taking over the global enterprise software market. So, what are the power cost implications for SaaS



players and their data centre partners?

At first glance SaaS, like its enterprise application perpetual licence forebears, may appear many layers above and removed from the physical equipment and energy needed to make it work.

The promise of SaaS (and cloud as a whole) is that it fulfils the desire of IT organisations to abstract their own service provision away from the infrastructure layer.

But if the enterprise is no longer managing the infrastructure then this falls to the SaaS provider to source - through building or buying - the data centres and power to deliver these applications.

The energy consumed by SaaS instances doesn't usually surface as a consideration when selecting which SaaS platform to use. (At least not in the public domain). But as the world focuses on reducing energy consumption and GHGs this is likely to change.

How SaaS applications are powered has huge implications across the entire supply chain of utility companies, data centre providers and ultimately end users.

SaaS Eating the Enterprise World

The revenues in enterprise applications are expected to be around \$450 billion in 2020 and the market is expected to reach nearly \$500 billion in 2021.

<https://www.statista.com/statistics/203428/total-enterprise-software-revenue-forecast/>

If we unpack this, an increasing share of the enterprise application market is going to be SaaS based.

According to FinancesOnline much of the enterprise applications world is already SaaS based. "As a key component of the cloud computing market, the global SaaS market size is estimated to end up at around \$158.2 billion in 2020. With a CAGR of 11.7% in the next four-year period, the projected SaaS market size will be about \$307.3 billion by the end of 2026. In 2020, it is estimated that the overall worldwide SaaS penetration rate will be at 36%." In the collaboration application segment SaaS penetration is getting the lion's share at 81% of the market, it says. The biggest SaaS applications are collaboration, human capital management, CRM, ERP, BI, SCM and Content.

Any list of the world's top SaaS companies usually places Salesforce at the top, even before it announced its intention to buy Slack for \$28 billion. Microsoft is usually number two followed by firms such as Adobe, Box and Amazon Web Services (AWS) SaaS. From the traditional enterprise software world firms such as Oracle, Docusign and IBM software are not far behind along with firms like Servicenow and Workday.

What every SaaS provider has in common is knowing how to sweat their assets.

Where SaaS Resides

The big SaaS companies can be split between those that own and operate data centres, Microsoft, AWS and others that buy data centre services. SaaS companies generally run a hybrid mix of data centres from the commercial colo space and cloud providers. The delivery model is based on redundancy.

Salesforce says: "Customer success drives our data center strategy and delivering the highest standard in availability, performance, and security is our top priority. To that end, we build and serve each Salesforce instance from two geographically diverse data centers to have availability our customers have come to expect from us. At any given time, your Salesforce instance is actively served from one location with transactions replicated in near real-time to a completely redundant, secondary location.

We regularly site switch between the locations for maintenance, compliance, and disaster recovery purposes. As we continue to expand and improve our global infrastructure presence, we recommend customers build their applications free of specific data center requirements to support a seamless Salesforce experience."

Salesforce-managed data centers [operate]...in: Chicago, Illinois, United States (USA); Dallas, Texas, United States (USA); Frankfurt, Germany (DE); Kobe, Japan (JPN); London, United Kingdom (UK), London North, London West; Paris, France (FRA); Phoenix, Arizona, United States (USA); Tokyo, Japan (JPN); Washington DC, United States (USA), Washington DC North, Washington DC South.

It adds: "In addition, we have instances served from AWS Cloud infrastructure in the United States, Canada, and Australia. These instances are located in two or more separate Availability Zones within each respective country."

So, the model is clear. SaaS provision operates on redundancy from paired data centres. This is true for every enterprise SaaS player.

Why Power Costs Matter

All very interesting but what has this to do with the price of butter?

Price per transaction is a priority for SaaS companies. The SaaS business model demands providers look to drive out costs and get the greatest ROI from their assets wherever and however possible. But those SaaS companies which rely upon colocation data centres don't have control over the power element of their cost base, because the way data centre power topologies have been designed dictates how power is provisioned. They are fixed and



wasteful. As SaaS continues to scale, power costs as a percentage of cost of goods can only rise. If SaaS providers are paying too much for power or having to pay for power they don't use then that becomes an additional cost to be passed on to the end user.

The Answer lies in "Power as a Service"

Here are some questions:

1. Will enterprise customers be forced by regulators to account for the energy and carbon cost of their SaaS applications?
2. As customers of commercial data centre operators, will SaaS providers demand access to flexible and adaptable power?
3. How can data centre operators respond?
4. Can inflexible power provision in data centres be addressed without ripping and replacing the existing infrastructure?

To address these questions, indeed to answer many other questions which are starting to surface about cloud provision of all kinds, 'Power as a service' (PaaS) needs to become an available offering from service providers. Fortunately, technology already exists which can enable the sorts of fixed data centre power systems which are ubiquitous to fulfil the

adaptable and redundant power requirements of SaaS applications.

Adaptable Redundant Power (ARP) from i3 Solutions Group, is one such solution designed to address many of the flexibility requirements to make PaaS a reality for SaaS environments. By making energy use more economical and flexible, ARP technology brings agility to data centres by accessing trapped power and reconfiguring the power system topology to provide granularity to match SaaS service levels. The obvious benefits are power resilience better aligned with SLAs, more efficient utilization and the reduction of needless emissions.

In the end all costs of production and delivery are ultimately charges the customer must bear. Unlike consumers, enterprises cannot ignore the cost of electricity that powers their applications. At the same time, SaaS market players will likely face more regulatory and investor scrutiny of their power use and carbon footprint. Neither they nor their data centre partners can afford to risk letting the cost of power spin out of control. Smart commercial data centre operators who are hosting, or wish to host, large SaaS customers can add value to their offering by providing PaaS based on technologies such as ARP.

In the end all costs of production and delivery are ultimately charges the customer must bear. Unlike consumers, enterprises cannot ignore the cost of electricity that powers their applications

Leading edge piping systems for data center mission critical cooling

Highly efficient, safe and fast

Benefits

- 25% better energy efficiency
- 100% corrosion free
- Off-site fabrication with bespoke engineer

In today's digital world, data centers are an essential part of our infrastructure, that suffers from an increasing pressure to build quicker, achieve higher levels of energy efficiency, and avoid downtimes during their operations. For that, it's required mission-critical cooling plants where the equipment and piping must be highly reliable and as energy efficient as possible, but also fast in its installation. But, can plastic pipes be used in a data center? What added-value do they bring? Which applica-

tions and where? The Data Center green and brownfield market are under increasing pressure, and no risk should be taken. The Swiss company GF Piping Systems provides leading-edge piping systems for reliable mission-critical cooling. Their range of leading-edge plastic piping systems, which can be used for numerous applications in data centers, cater to these high demands of the industry, offering significant advantages during commissioning and operation.



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For more information about innovative cooling solutions, calculation tools and other valuable technical data to key engineering questions, sign up in our Data Center dedicated Portal:
data-center.gfps.com

Plastic pipes for cooling meet ultra-stringent quality requirements for hyperscale data centres

As modern life becomes increasingly digital, data centers need to be built faster and be completely operational as soon as they are finished. Thus, the quality requirements imposed on installed components are becoming more and more stringent.

ENGINEERING and off-site fabrication solutions for piping systems can help ensure on-schedule completion of mission-critical cooling applications by dramatically shortening installation time, without compromising quality. At a new hyperscale data center under construction in Ireland, the ecoFIT PE-100 (polyethylene) system from GF Piping Systems has been chosen for the process cooling water. The use of this system combined with off-site fabrication has allowed on-site installation time, for the process water, to be reduced remarkably from 6 months to 6 weeks.

Data centers are vital to the digital world we live in today, handling millions of emails, search queries, social media logins and transfers of sensitive data on behalf of individuals and corporations every single day. Operational reliability and optimum security are the two key goals for all data centers. This means that data centers cannot afford downtime: they need to run 24 hours a day, 7 days a week, all year round. The servers they contain, as well as mission-critical support systems, such as cooling and power supplies, need to operate flawlessly and without interruption for their specified service lifetimes and therefore be designed and installed using the very latest techniques.

As if all this isn't challenging enough, consider this: with data flow demands on data centers the world over being driven ever higher by the global pandemic in 2020, data center construction projects now have to be delivered faster than ever before, but with absolutely no relaxation of the quality standards applied to system design and installation processes. Contractors need to be ready to go on-site when required, and they need to get installation work right the first time; quality defects mean delays, and no slippage in project schedules is permitted.

International building services engineering firm Dornan Engineering Ltd. – with extensive large-project experience – has been working on the data center construction project just outside Dublin for the past four years. Dublin is currently the fastest growing data center hub anywhere on the planet, expected to grow by some 240 MW in terms of power consumption in 2020, making it the fifth-largest data center city in the world.



Against this backdrop of continuous operation and increased demand for electricity, sustainability is, of course, also key: with cooling systems accounting for around 40% of a data center's power consumption, the project partners worked together to enhance the efficiency of the cooling plant. This effort, combined with the use of 100% renewable electricity, improved the sustainability of the facility enormously. In addition, the use of groundbreaking new prefabrication techniques and long-lifespan, lightweight plastic pipes drives down direct and indirect CO2 emissions, and results in quality and efficiency improvements. At the peak of construction, over 1,500 workers were on the 250-acre site every day, building the huge spaces designed to house thousands of servers handling data from around the world on behalf of a leading technology firm. Phases 5 and 6 of the project are scheduled for completion in 2021.

Keeping it cool

Servers generate heat, which must be removed safely and efficiently in order to ensure reliable and secure operation. Data center cooling systems are genuinely mission-critical: overheating can cause computing equipment to malfunction and shut down, potentially resulting in loss of service for users.

GF Piping Systems' ecoFIT high-density polyethylene (PE-100) piping systems and valves, ranging in outside diameter from 63mm (2") – 250mm (10"), were selected for the mission-critical process cooling water system components deployed on the roof of the data center buildings, as well as for the condensate drainage and double-walled rainwater drainage systems. GF is a global expert in safe and reliable transportation of water, chemicals, and gas, specializing in durable, maintenance-free piping systems, with a portfolio of more than 60,000 products and customers in over 100 countries.

GF ecoFIT components are ideal for use on rooftops thanks to their complete weathering and UV resistance as well as their low weight. Approximately 8 kilometers of piping were required per building, providing cooling for systems with a combined power capacity of 70 MW in phases 5 and 6, and encompassing two buildings, each with a floor area of 25,500 square meters. (Phases 1 to 3 totaled 96 MW of power capacity).

The GF ecoFIT PE-100 complete pipe system is suitable for a range of industrial uses, including



cooling water and wastewater, as well as chemical applications. The corrosion-free system combines the ability to withstand severe rooftop environmental conditions - including UV light, heavy rainfall, and temperature variations from -50 °C to 60 °C - with high impact strength and a service lifetime of over 25 years. A high level of energy efficiency (due to low thermal conductivity of 0.38 W/m·K, which minimizes heat loss) as well as low installation and maintenance costs were the key decision factors for all stakeholders in deciding to use GF ecoFIT.

GF, as the piping system provider, leveraged its in-house expertise in data centers to provide a range of engineering services to support the design and installation process, including stress analysis, static load calculations, re-design of piping isometrics, piping expansion/contraction analysis, and recommendations for the design of pipe supports. These services helped add crucial value to the project by enabling the piping system design to be verified and adapted where necessary.

The supplier also provided non-destructive testing (NDT) services based on state-of-the-art ultrasonic examination technology, allowing plastic piping welds

At the peak of construction, over 1,500 workers were on the 250-acre site every day, building the huge spaces designed to house thousands of servers handling data from around the world on behalf of a leading technology firm. Phases 5 and 6 of the project are scheduled for completion in 2021

in critical locations to be scanned before pressure testing to ensure safe and error free commissioning. To ensure safe and reliable on-site workmanship, GF, as manufacturer, trained and certified all installers in the installation and jointing of GF ecoFIT components, thereby helping to reduce costly on-site errors to a minimum. Thanks to its global footprint of sales companies, GF can also offer GF plastic experts to visit sites on a regular basis, to ensure ongoing top-quality workmanship.

Off-site fabrication: key to meeting time and quality challenges

Data centers, with their unique combination of project scale, tight time schedules, very high quality requirements and restrictions on the number of people allowed on-site (due to security and currently added COVID-19 concerns), pose an extremely tough challenge in terms of on-site installation. GF used an off-site fabrication facility to meet these challenges head-on, reducing on-site labor requirements and ensuring project milestones were achieved.

The off-site fabrication facility allowed piping system modules to be pre-assembled in a controlled environment, thereby helping to meet quality assurance requirements, and reducing time on-site. Trace heating, insulation and cladding are all fitted

to the piping system off-site too, ensuring fast and efficient installation of the pipework when the modules are taken on-site. The supplier's quality control specialists were involved throughout the off-site prefabrication process.

All of this adds up to considerable time savings. GFs' Mark Stuart, Data Center Sales Director (Europe), pointed out that installation of the GF ecoFIT process cooling water piping modules for phase 5 of the data center project was completed in just six weeks, "compared with 24 weeks to install a significantly smaller system in an earlier phase of the project. We achieved this time saving thanks to a combination of design and engineering support and off-site prefabrication".

The Senior MEP (Mechanical, Electrical & Plumbing) Package Manager for the project added: "We would like to take an opportunity to acknowledge, celebrate and say thanks for the big wins on the project. I think it is fair to say that the pipework modules on the roof are one of the biggest successes on the project campus to date. Having witnessed the construction of the process water system from phase 1 through to 3 (which is significantly smaller compared to phase 5) and compared it to what has happened in the last 6 weeks, it has been astounding to see. We have accomplished in 6 weeks what has taken 6 months on previous phases. This is an amazing achievement!"


It is clear from these details that off-site pre-fabrication of piping modules is a "win-win", bringing benefits for installer, customer and project end-user alike.

A shared commitment to quality

The customer (Dornan Engineering, Mechanical contractor) very much appreciated the level of knowledge and support provided by GF Piping Systems, and is not anticipating any quality issues during the operation of the process cooling water system pipework. "We expect the products to last as promised up to the lifespan of the data center, and don't expect any failures in fittings, provided they are installed in line with manufacturer's guidelines," said Martin Gildea, Dornan Project Manager. The biggest challenge for Dornan on such a complex project concerned ownership of engineering responsibilities and ensuring that suppliers understood the importance of sign-off requirements. For data centers in general but especially hyper-scale projects, regardless of project time-line pressures, quality is always critical and will always be the highest priority.

Once all of the data center's different applications are up and running, the end customer can be confident that the GF ecoFIT PE-100 components installed in the mission-critical process cooling water system will perform their vital role ensuring that global digital traffic, critical to the present and future world we live in, functions efficiently and reliably.





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The benefits of Cloud-based monitoring for Enterprise IT

For many organisations, the cloud has become a crucial vehicle for hosting IT applications and delivering digital services.

BY NICK EWING, MD, EFFICIENCYIT, AN ELITE PARTNER TO SCHNEIDER ELECTRIC IN THE UK



DEVICES, ranging from PCs to smart phones to on-premise infrastructure systems transmit digital information from data centres which, may be deployed close to the point of use in an edge facility, or, depending on the criticality of the application, may be located in another part of the world entirely. In January 2021, Gartner forecast that worldwide IT spending would grow 6.2% during the year ahead. What's clear is that with the move towards remote working and the need to keep business critical infrastructures powered, connected and online, data centres and the cloud will play an ever-more important role in business continuity.

The move to the cloud

As greater numbers of organisations consider moving to the cloud, the more likely it is that they will also

require specialised infrastructure deployed within a data centre. The maintenance and operation of which will usually be a matter for the service providers' themselves, where systems availability, uptime, maintenance, security and backup generally form part of a service level agreement (SLA).

However, the larger an organisation and the greater the number of operational sites, including branch or regional offices, the more likely it is that they will also utilise legacy, on-premise systems, those for whose operation they are solely responsible. Furthermore, even if many of its core servers have been outsourced to a colocation facility, the operation and maintenance of this equipment can often remain the responsibility of the enterprise itself. Therefore, it quickly becomes apparent that for enterprise IT resiliency, there are a great number of considerations, complexities and challenges that an IT manager must overcome.

Across the enterprise

In many enterprise sectors, including retail and manufacturing, IT is deployed as on premise infrastructure. Such equipment is, by its very nature, business-critical and downtime immediately has an impact on production volumes, profitability, sales and revenue.

The more an enterprise embraces digital transformation and commits their mission-critical functions to networked infrastructure, the more dependent they become on that equipment remaining operational and connected to the cloud.

Visibility of system's uptime, operational efficiency, security and environmental status, and the need to be informed of the power, cooling and IT infrastructure in real-time, is paramount. Power outages, for example,



compounded by inadequate or malfunctioning uninterruptible power supplies (UPS) can bring operations to an immediate halt. While malfunctioning cooling equipment can also lead to IT outages and crippling, unnecessary, energy costs.

For an enterprise with many widely distributed premises and a large number of IT systems, taking control of all their infrastructure and making sure that it is operating in as a reliable and cost-effective manner as possible is essential. Monitoring, management and maintenance remains key, and thankfully the tools to streamline this process and deliver new remote monitoring capabilities are fast becoming available.

The role of IoT in remote management

Today, Internet of Things (IoT) technology has become a standard component of hardware assets including racks, power distribution units (PDU), UPS and cooling equipment. Network-enabled sensors monitor their status and send alerts to central management consoles. In this way, management are alerted to power, capacity or service issues quickly in real-time, and warned of potential malfunctions before they become critical.

The role of aggregating, analysing and processing this data remains the responsibility of next-generation data centre infrastructure management (DCIM) software, which in recent years has moved from its role as an on-premise solution, to being hosted in the cloud. This move has made the software more accessible to a broader range of applications, faster to deploy and scale, and far more cost-effective.

Moreover, by using the cloud, an enterprise can avail of the most advanced modern software, at very low acquisition cost, to identify and manage all essential infrastructure on their network. It provides instant visibility of all physical infrastructure assets, regardless of vendor or manufacturer, and its subscription-based model removes the need to acquire dedicated hardware with the attendant configuration and customisation costs.

AI and Machine Learning

Another key advantage of using next-generation DCIM is the analytical capabilities provided via machine learning and artificial intelligence (AI) technologies. By analysing data from other infrastructure installations, and using the information to identify potential faults, the analytics can help to maximise the operation and efficiency of all assets on an enterprise network and proactively reduce downtime.

This includes offering the user predictive maintenance capabilities. For example, keeping the operator aware of when UPS batteries are likely to need replacement so that such tasks can be performed with the minimum of system disruption and before an outage becomes business-critical. Similarly, a cooling system that is experiencing faults or operating at



less than maximum efficiency can also be identified, and remedial action taken at the earliest opportunity. To enable greater levels of remote monitoring and management, next-gen DCIM allows the user to view the status of distributed IT systems from any location via a secure smart-phone application. The data aggregation and analysis continues to take place at a central console, but through the app, corrective maintenance and systems repairs can be assigned remotely to on-site teams or external service partners. This becomes especially important for an enterprise requiring maintenance across multiple sites.

Moreover, if a UPS battery or component needs to be replaced, a maintenance or service team is alerted via their smartphone and the subsequent remedial action taken. In this way, an enterprise that operates in many premises or across a wide geographical area, can maintain its infrastructure efficiently, without the need to employ permanent technical staff at every location.

The business case for remote monitoring

For any technology-dependent enterprise, visibility of its mission-critical infrastructure drives operational efficiency with immediate benefits to the financial bottom line. DCIM software provides that visibility, along with analytics and remote maintenance with all the convenience and reliability of the cloud. This includes low acquisition cost, continuously updated and improved software, and the benefits of machine learning and artificial intelligence, which drives greater insight into the operation of all hardware assets.

As more IT professionals seek to maintain systems uptime safely and without the need to be located on premise 24/7, the remote monitoring capabilities enabled via next-generation DCIM have become an essential tool; offering a fast, simple and AI-enabled solution that delivers business continuity, while bridging the gap between physical infrastructure and remote staff.

Driving digital transformation through DISRUPTION

The COVID-19 pandemic is one of the biggest business disruptors in history. Every company, in some variation needed to rapidly adapt their operations. Many organisations were forced to shift entire workforces to remote working models, which sizeable companies like Twitter, Facebook and Google have now adopted permanently.

BY GRANT DUXBURY, DIRECTOR, PRE-SALES ENGINEERING, APTUM TECHNOLOGIES

WITH THE SUDDEN JUMP into the deep end of digitisation, some companies faced a wake-up call – how do we make this shift? Worse yet, would it be possible?

The race to cloud migration in 2020 proved to be a steep learning curve for many companies. In fact, as identified in Aptum's global survey, nearly all IT professionals surveyed (99%) believe cloud services are essential to their organisation's success, but performance concerns remain an evident obstacle to realising these benefits.

Scale, Elasticity and Digitalisation

In the early days of COVID-19, cloud computing was

essential for three main reasons: scale, elasticity, and digitisation. As businesses began to stabilise after the initial disruption from the pandemic, one thing became overtly apparent – a company's velocity, its ability to do business and the deployment of new IT structures were slowed down if not using the cloud. Those who could not adapt during this time faced further disruption, including supply chain interferences or on-premise staffing and resource shortages.

The ability to scale an organisation's environment up and down – on demand – became critical. There is a vast difference in elasticity needs across industries based on the level of impact caused by the pandemic, but it became an obvious success factor for all. The



overdue need for digitisation became essential as organisations experienced trial by fire when quickly entering digital transformation. This exposed the best approach for successful cloud migration – identifying a strategy.

Common Driver

The realisation of cloud migration success was tricky for many companies, despite their ambition to achieve it. For example, Aptum's study found that 72% of respondents name increasing efficiencies as one of the main drivers behind cloud adoption. Yet only 33% report complete success at increasing efficiency in the cloud. The divide between expectations and full success has a root cause – a flawed strategy born out of insufficient discovery and unrealistic expectations. Adopting a strategic approach through education, understanding, planning and prioritisation allows businesses to have a clear viewpoint of the goal and map a successful transformation migration strategy.

Key Understandings

The Aptum study suggests that as cloud environments become hybridised, organisations will need more support due to increased complexity. Often this is a result of companies attempting to move to cloud environments too quickly, and without the right understanding. Cloud is not a one size fits all – it requires an approach that considers core business cases and assesses business objectives.

The study also states 71% of respondents experience negative effects due to the rate of cloud transformation; IT expenditures is the leading cause at 33%. Partnering with a Managed Service Provider (MSP) can alleviate the time and expertise spent on establishing a mature cloud operations model, leaving organisations to focus on cloud application's business value.

Identifying the Economics

Part of adopting a strategic approach is understanding the economics and performance outcomes a business hopes to achieve. Questions like, "how much will it cost to host data in a given cloud platform if there is a sudden surge?" or "how much will it cost to move and secure the data?" are crucial to developing a full understanding of the end goal.

Another key component is the ROI defined for apps migrated to the cloud. Would it be worth migrating a legacy app to the cloud or adopting a hybrid approach until its shelf life has expired? This ROI is differently defined for apps hoping to be implemented and is beneficial to identify ahead of time.

Accelerating Cloud Transformation

As mentioned previously, organisations must define business objectives and identify realistic outcomes. The survey defines very distinct conclusions – companies had a higher expectation than what was executed. Those who initially rushed into the cloud



journey experienced a blunt realisation of what they could or could not achieve, given their current infrastructure.

Another key learning from the survey is that organisations should identify what skills they have in-house first, and determine where they need to seek support from an MSP for a successful transition. An MSP's purpose is to recognise and deploy a comprehensive assessment to guide a company toward a faster and more holistic cloud journey. Understanding the performance metrics prior to migration, and identifying a proper baseline during the assessment allows for a fair comparison of the performance realised after implementation.

Finding Success

If COVID-19 taught us anything, it is that organisations cannot predict what is to come, but they can prepare and futureproof for future crises. Therefore, companies must now distinguish what agility means to them and how important it is to integrate it into their data infrastructure and business model. Companies must also consider the distinction between goals and expectations as well as the reality behind achieving them.

To achieve successful digital transformation, creating a strategic approach is key. Executing a well thought out strategy that exposes pain points, considers internal expertise, business objectives, and whether outside support is needed are a few of the pivotal elements necessary for accomplishing a successful cloud migration.

Hybrid working for the long haul: What's next for the cloud?

As we begin a new year, we can start to look back at the lessons we have learnt throughout 2020 and how this will shape the year ahead. With employees working from home or in a hybrid fashion, cloud technology has been at the core of keeping people connected both professionally and socially.

BY PETE WATSON, CEO OF ATLAS CLOUD



BUSINESSES will be looking to replace any 'quick-fix' solutions with more permanent ones, that enable them to operate in a more flexible way for the future - a development that will be well received by workers.

Setting up for a hybrid future

A recent survey exploring the workplace of the future found that 74% of professionals across the UK now want the flexibility to work in a hybrid way, working between the office and at home. It's safe to say this new approach is for the long haul and that the cloud will remain at the forefront of both this physical and cultural transformation.

Whether for scalability or survival, implementing the right long term strategy and setup will be critical to successfully embracing the cloud.

Whether that be a public cloud service such as Microsoft Azure or a private cloud service, choosing the right cloud model will have a huge impact on organisations throughout 2021. The real question is,

how and where can the cloud add the most value in the race to secure, productive, successful hybrid working, and which technologies can unlock this potential at scale?

Building for security

The security of company platforms is paramount as more people work in a remote setting. However, these considerations are even more crucial where a hybrid model is concerned. As employees carry laptops back and forth, between their office and home, this naturally increases the security risk if the laptop is lost. Virtual desktop-as-a-service (DaaS) operating within the cloud can solve this problem.

This is because the desktop can be accessed securely through a multi-factor authentication process on any device, meaning that staff can work fluidly across multiple devices, through one point of access. This eliminates the need for employees to carry their laptops back and forth between the workplace. However, if employees prefer having a primary device that they ferry between their home and work, there is still no security threat. This is because with a cloud set up, sensitive information isn't stored directly on the device. Instead, it is secured safely in the cloud. Therefore, if the device is stolen, cybercriminals can't access the sensitive data or steal important information from the laptop.

Another way businesses can increase security is by developing a robust Bring-Your-Own-Device (BYOD) policy, where personal devices are used for work.

BYOD can lead to higher employee productivity and satisfaction as it gives workers the flexibility to work with a familiar setup. By utilising an Endpoint Management Solution in conjunction with BYOD, businesses can secure all the devices



connecting to their network, whether company-owned or not.

Managing the security of all devices under one solution also means that it is easier for businesses to protect their data. When implementing an Endpoint Management Solution, businesses can take advantage of services that come as part of Microsoft 365 and Microsoft Azure subscriptions as well as more advanced services, such as an enterprise solution monitored by a Managed Service Provider. With recent research finding that 65% of small to medium-sized businesses have been exposed to cybersecurity attacks, it is more important than ever to implement solutions that will reduce risk of compromise.

Staff wellbeing and a more connected workforce

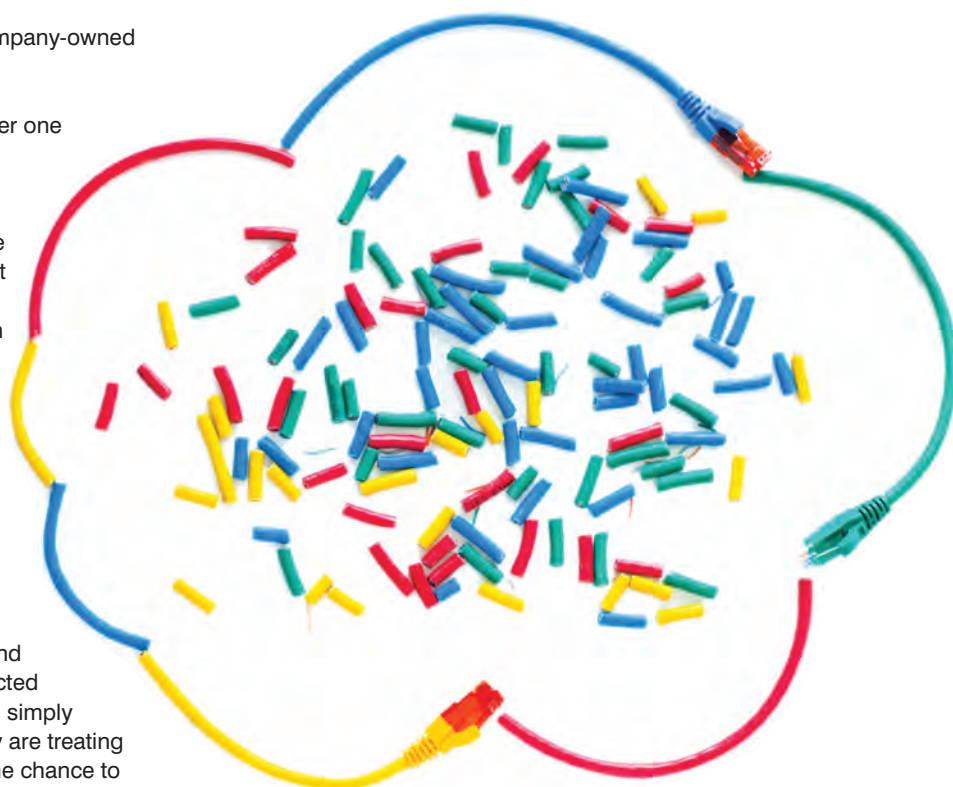
With some people working from home and others in the office, maintaining a connected workforce both virtual and face-to-face is simply crucial. Businesses must make sure they are treating their employees fairly, giving everyone the chance to speak up and still be heard.

After this year, businesses now have access to the right communication tools and technologies to allow effective communication. With platforms like the Microsoft 365 suite, employees can collaborate from anywhere and stay connected with everyone, accessing their work from multiple devices. Many businesses have supercharged Microsoft 365 by taking advantage of their Windows Virtual Desktop allowances in Microsoft Azure, for a more flexible and centralised computing experience through the public cloud.

2021 is looking like yet another unpredictable year, and lack of face-to-face communication could result in employees struggling with their mental wellbeing. This is supported by research which has found that lack of in-person communication doubles the chance of employees suffering from mental health issues. Therefore, businesses must ensure that they implement a strategy to enable their workplace to stay connected and offer support to one another. Cloud-based communication platforms like Microsoft Teams are enabling employees to stay connected, collaborate effectively and maintain productivity within the workplace. Due to the accessibility and high security of Teams, keeping in touch with colleagues and subordinates has never been easier.

Productivity at scale

Cloud-hosted desktops and applications offer countless benefits to businesses evolving into a hybrid workplace. One of the biggest advantages of moving to a hosted setup is that employees can access their files and data from any location, anytime, on any



device. With employees working both from home and in the office, they can remain productive regardless of location.

According to research, hosted desktops and applications also increase productivity by 20% by offering employees flexible working resulting in a happier work environment. Alongside this, they offer the opportunity to work flexibly, leading to a happier work environment. Employees can benefit from having all their essential work tools permanently at their disposal, boosting communication and collaboration. It is clear that the benefits to employees are significant, but we can also go one step further.

For example, operating on a public cloud such as Microsoft Azure with a full suite of workplace applications unlocks vast scalability. With a public cloud approach, organisations can scale their usage up or down without the investment in infrastructure that may be required in a private datacentre or on-premise scenarios. The reduction in capital expenditure and the adaptability afforded by the cloud will prove invaluable to UK businesses – particularly in such challenging economic times.

While the future of work is evolving, the future of the cloud looks bright. Throughout 2020, cloud adoption has been an integral part of building hybrid workplace strategies and will continue to play an incredibly important role throughout this year. Implementing the right cloud set-up in 2021 and beyond will allow IT investments to go further and will keep employees connected and information secure.

ENTERPRISE MULTI-CLOUD:

What needs to change in 2021

In this new wave of cloud adoption, we are witnessing a rapid increase in multi-cloud models as a growing number of enterprises seek more choice for their data and workloads. No single cloud model can fit the diverse requirements and workloads across different business offerings.

BY MICHEL ROBERT, CEO OF EPSILON



ENTERPRISES are seeing the benefits of multi-cloud, but the challenge is finding the right skills and tools to make it work for their organisation. In fact, an IDG survey revealed that 56% of respondents felt that managing multiple cloud platforms requires more internal expertise than what cloud providers would have us believe. A key reason enterprises don't achieve their expected return on investment (ROI) in cloud is operational complexity. This needs to change.

Enterprise Challenges Across the Cloud

Enterprises are facing a whole range of challenges when it comes to connecting and managing multiple clouds. Here are some of the challenges they need to overcome to get the most out of their cloud strategies in 2021:

- Architecture Gap** – Enterprises running on a singlecloud are limited to its native construct, which can cause limitations that enterprises are not even aware of.

When scaling their businesses, they will find it difficult to connect different cloud services without the right model. If they choose to extend to other clouds, they may struggle to replicate the same architecture and design with the other clouds. They will have to re-work their entire design, due to a lack of common control and data plane.

- Basic Networking Features** – When an enterprise chooses a hyperscaler for its cloud services, it will have to manage its own networking and security. Such services often lack visibility into real-time network data and analytics, as well as offering little control in terms of availability and encryption.
- Multi-Cloud Connectivity** – Most of the main cloud service providers (CSP) are not interested in making it easy to expand to other cloud providers. Enterprises can take a multi-cloud approach to avoid lock-in and also gain better costmanagement.





- Complexity and Skills Gap** – Each cloud has unique networking capabilities and limitations, which require skills and knowledge specific to the CSP. Not all enterprises possess the ability to deploy and manage these environments.

Enterprise Challenges Within the Cloud

Within the cloud, another set of challenges arise for enterprises:

- Changing Enterprise IT Requirements** – Enterprises need the same level of functionality, visibility and control in the cloud as they had with on-premise or their private cloud.
- Lack of Visibility** – CSP do not expose the detailed operational visibility that enterprise IT requires.
- Limited Security** – End-to-end encryption for data in motion, secure network segmentation, policy-based ingress and egress control, and both corporate and regulatory compliance and governance are all significant challenges for enterprises.
- Manual Process** – It is difficult, error prone and resource intensive to manually configure and maintain an enterprise cloud network environment of any significant size.

To overcome these challenges and get the most out of cloud in 2021, enterprises will need to look at service provider partners that can support them with the right expertise and technologies. An end-to-end multi-cloud

service should provide an enterprise with seamless connectivity and optimised data management within and across the clouds such as Amazon Web Services, Google Cloud Platform, Microsoft Azure and Oracle Cloud. It should also provide the tools for efficient business growth with ongoing support and add-ons to the enterprise when required, enabling better scalability as the business reaches new levels of growth.

A Multi-Cloud Future

In 2021, managed service providers servicing the enterprise market will need to make a multi-cloud strategy their priority. It has to make operations simpler so that IT departments can focus on the application and the values that it brings to the customers and its business.

Enterprises will need a purpose-built multi-cloud solution that's simple to use and offers operational visibility and control with automation. With high-speed, low-latency connectivity, as well as advanced visibility and intelligence into the cloud network performance, they can optimise their cloud operations without adding complexity. A multi-cloud solution can provide a solid foundation for the future, moving enterprises from basic cloud connectivity to an advanced end-to-end multi-cloud network architecture. By overcoming the common challenges within and across cloud environments, multi-cloud can accelerate enterprise digital transformation in the cloud in 2021 and beyond.

COVID-19 has accelerated the Cloud journey – data responsibility now needs to catch up

COVID-19 has been a significant catalyst for cloud adoption, pushing many organisations past their initial reluctance. Indeed, cloud spending is set to climb 19% in 2020, even as overall IT spending is estimated to fall 8%, according to industry analyst Gartner.

BY FLORIAN MALECKI, INTERNATIONAL PRODUCT MARKETING SENIOR DIRECTOR, STORAGECRAFT

STORAGECRAFT recently conducted a major survey that delves into cloud computing trends and how organisations feel about cloud adoption in general. The study revealed that almost half of all respondents (44%) increased their cloud backup and recovery services because of COVID-19.

The pandemic has driven a wide range of cloud backup and recovery investments, with 61% of organisations increasing investment in cloud backup use and 28% implementing data recovery plans that rely on the cloud.

The cloud adoption trend is likely to persist even after the pandemic subsides, mainly because many organisations now feel more comfortable with remote working. Companies like Facebook and Microsoft have publicly stated that their employees can permanently work from home, even after a widely adopted vaccine.

As a result, more support will be needed to effectively manage and protect data at these edge locations. And that raises an interesting question: is the cloud secure? A lot of companies don't think it is. Our survey found that 44% of organisations believe data backed up to a public cloud (AWS, Azure, Office365, etc.) is less safe than data backed up on-premises.

This belief is understandable. It is human nature to trust yourself with the care of something valuable, such as your beloved pet or precious house plant, rather than someone else. The same holds for your data. When you go to the cloud, you are handing over the care of your most trusted asset, so there is naturally some hesitancy there, whether the risks are real or not.

Even though COVID-19 has been a significant accelerant of cloud uptake, many organisations are still hedging on their cloud journey due to security, control concerns, and hidden indirect costs. But are these concerns justified? Are the security risks serious enough to put a halt to your cloud transformation? The short answer is "no." Most public clouds are more secure than any system you could install in your datacenter.



As organisations transition their data to the cloud, they should understand that cloud security is a shared responsibility between the cloud service provider and the customer. Cloud service providers, such as AWS, typically secure the core infrastructure and services as part of their commitment. When it comes to securing operating systems, platforms, and data, there are several tools provided by cloud vendors to protect data; however, the customer must still take responsibility to ensure their data is safe.

Similarly, with a service like Office 365, Microsoft guarantees the service, but it does not guarantee your data's safety. It will secure your data for 30 days, and after that, it cedes responsibility. That is why it recommends that you use third-party software to protect your data long-term.

Indeed, you should have the right cloud backup and recovery solution to protect your data comprehensively and gain the full control you need. It will help if you look for a cloud storage solution that safeguards data by taking continuous snapshots and provides multiple recovery points. This solution ensures that your data remains protected and always gives you easy access and visibility into your data. The good news is that more and more organisations realise that data protection is a shared responsibility and that they cannot leave it all to their cloud provider. When asked whose responsibility it is to recover data and applications in a public cloud (AWS, Azure, Office365, etc.) in the case of an attack or loss of data, 60% of survey respondents said it is their responsibility. In comparison, only 40% said that it is their cloud provider's job.

Of course, there are other barriers to putting data in the cloud, such as compliance and regulation concerns. All told, 86% of survey respondents confessed that their adoption of cloud backup and recovery had faced obstacles, with security, compliance requirements, and lack of control of the data cited as the most significant concerns. These barriers are even trickier because every industry—whether finance, healthcare, education, etc.—is always changing its rules around what kind of security is needed and what certifications are required. Securing compliance and certifications is a costly and time-consuming burden for an organisation to take on,



so sourcing a cloud provider that already has all the required compliance and regulatory certificates can be a benefit of using the cloud.

A final takeaway of interest: the survey revealed a strong reliance on Managed Service Providers (MSPs) in the cloud migration process. It is perhaps not surprising, as MSPs have proven to be valuable partners in this time of crisis and have played a critical role in helping organisations and their remote employees get up and running as quickly and seamlessly as possible throughout the pandemic. This relationship looks likely to continue. In our survey, more than a third of midsize IT teams said they would increase MSP spending for data backup in the cloud and cloud backup of remote office and branch office locations.

As companies venture further along in cloud adoption, regardless of whether it is a private, public, or hybrid cloud approach, they will inevitably realise the many operational and financial benefits of moving workloads to the cloud. For organisations that advance in their journey to the cloud, it will be critical that they have the right data security posture and processes outlined and implemented – or they may be in for a rude awakening.

There are other barriers to putting data in the cloud, such as compliance and regulation concerns. All told, 86% of survey respondents confessed that their adoption of cloud backup and recovery had faced obstacles, with security, compliance requirements, and lack of control of the data cited as the most significant concerns

What should a tier two carrier look for in a data centre operator?

Paul Gazzard, Head of Major Accounts, Telehouse provides his top tips for tier two carriers when it comes to recognising the right data centre provider



FOR SMALLER OR NEWLY established carriers, competing against larger and well-established carriers is a significant challenge. Many tier two carriers will look to profit from a larger carrier by using its superior network through a business arrangement. This can also be a viable option for carriers that want to expand into new regions where they don't have existing network infrastructure. However, the smaller carrier will still require the services of a data centre (DC) operator to host hardware and provide connections to other carriers and services.

The tier one carrier's network will offer the reliability that will be critical to the tier two carrier upholding a good reputation and growing its customer base. However, standing out in a crowded and extremely competitive market isn't always easy. Faced with the challenge of expanding their market share by providing a service as good as any of the larger carriers out there, smaller carriers must choose wisely when partnering with a DC operator.

Whether it's a new carrier that's trying to become better established in the market, or one that is looking to extend its reach into a new region, there are specific attributes smaller carriers should look for in a DC operator:

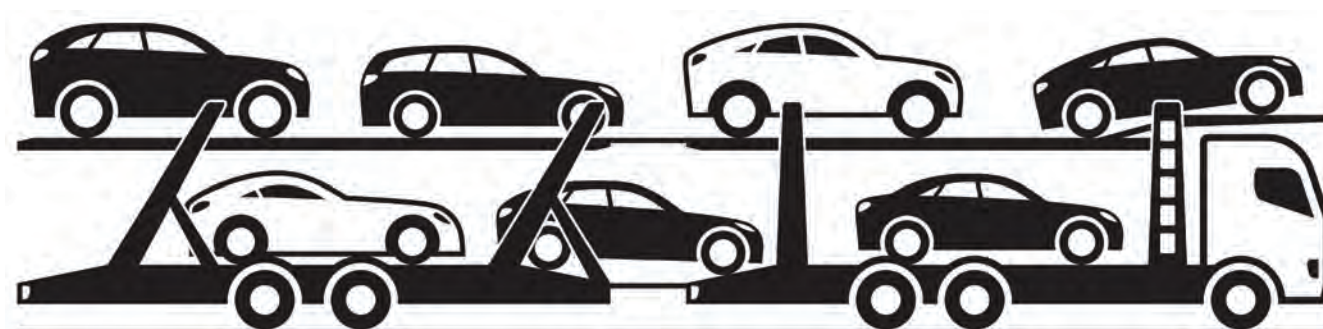
Connections

One of the most crucial things tier two carriers need to look for in a DC operator is access to other carriers, especially tier one carriers, in their client base or wider DC network. Being housed in the same facility or sharing a network with other carriers will make it as straightforward as possible to connect with those desired carriers' networks. This will also provide peace of mind that the DC operator is trusted by those other networks. This also reduces the tier two carrier's network latency when they are directly connected to other networks they are piggybacking on, which is especially crucial to ISPs.

The second key benefit of connections to tier one networks is that they provide a global reach for voice and data traffic. Peering options, such as those provided by internet exchanges, are also key for tier twos in reaching other carriers.

Scalability

Any smaller carrier will have growth on its agenda. But to increase market share, carriers need to ensure they have the computing power to support their networks. It's essential that the DC operator can provide scalability. The chosen DC operator should have additional rackspace readily available for its





customers, providing the flexibility they need to scale up their storage space as and when is necessary.

Location

The geographical location of a DC can impact the speed and latency of the carrier's service. The further servers are away from the carrier's users, the further data will have to travel across the network. Carriers' customers will typically be using the network as they move around, meaning the DC network will need to cover as much of the region the carrier wants to operate in as possible.

Security Robust security is an essential attribute in any DC operator. Cyber attacks, data breaches and loss of service can lead to reputational damage and loss of customer trust, fines from industry regulators and financial damages. As well as best practice cyber security protocols, carriers should also enquire about physical security. Each site should have on-site security staff, reinforced walls, locked server cabinets and cages, as well as environmental controls that detect unexpected changes to temperature and humidity.

Network uptime

Carriers will want to avoid network outage as much as possible. A step every DC operator should take

to prevent outage for its customers is implementing both an uninterruptible power supply (UPS) and backup generator that will keep the DC operational during worst case scenarios such as grid outages, extreme weather, or any other events that may affect the power supply. Each DC should also have a team of engineers onsite 24/7 to respond to any issues as soon as they unfold.

AI and machine learning will begin to play a greater role in DC operations, predicting and reacting to operational issues before they happen without any human intervention, or at least notifying engineers of issues before they take place. It's worth asking DC operators if, how and when they will use – or already use – AI and machine learning to manage their facilities.

There's certainly plenty to think about when it comes to identifying the most suitable DC operator to support a tier two carrier. While the steps outlined in this article are a good starting point, it's well worth engaging with an industry expert for a detailed conversation about what's required and what the right operator should provide. The ideal DC operator will be able to offer the carrier a bespoke service that is tailored to its unique requirements.

Ireland at the heart of Europe's digital economy

In the last year of dealing with COVID-19, businesses and societies have depended on data more than ever and will continue to do so once the crisis ends.

BY LEO CLANCY, HEAD OF TECHNOLOGY, CONSUMER AND BUSINESS SERVICES AT IDA IRELAND



IN A PROGRESSIVELY DIGITAL WORLD, data is at the heart of business processes. It has become a crucial component in all industry sectors, whether it's understanding customer behaviours, detecting how products are performing or identifying broader trends.

Data needs to be stored and processed to provide the digital products that make our lives better. In the data economy that role is filled by the cloud and data centres are the physical locations – the 21st century infrastructure that make up that cloud. They can be thought of as the factories of the digital services age.

Companies that invest in data centres don't operate big factories full of people on assembly lines, they employ tens of thousands of people who engage with the products from other locations. By facilitating the development of these digital factories from an early

stage, Ireland has positioned itself as a sought-after location for data centre investments, welcoming a host of other global technology companies to settle in the centre of Europe's digital economy.

Huge investment, global leaders

The 'data industry' matured in the late 1990s and early 2000s and is now the fastest growing economic sector in the world, serving billions of people daily. It replaced earlier industries focused on processing data in files, on CDs and other media.

Recognising the growth potential of the emerging cloud industry, Ireland worked hard to attract some of the first European data centre investments from the leading players in the world. Key to Ireland's pitch for this business was a visionary government investment in telecommunications and a long-standing quality of





the country's electricity grid, not to mention the wealth of local talent available.

Marquee names including Microsoft, Google and Amazon Web Services all invested in data centres in Ireland in the 2000s, when this industry was much smaller scale, followed by Facebook in 2015. The investments now made are huge and high impact. For example, Facebook's data centre investment in Clonect spent €229 million per annum on average over four years on construction from 2015 to 2018.

According to an IDA study in 2018, data centres contributed over €1bn of economic activity per annum in Ireland over the previous seven years – direct and indirect – just through building and operating the facilities themselves. This number has likely grown significantly since. In addition to this direct impact, from IDA's latest figures, around 20,000 direct jobs in the Irish economy are supported by those who also operate very large data centre infrastructure.

The national impact in terms of salaries alone is very substantial, for what are very high-quality jobs. Employment levels at these companies continue to grow with several leading companies announcing new jobs and scaling activity in recent years, such as Amazon, which announced 1,000 new jobs in

Ireland in July 2020, 18 months after Facebook said it was adding 1,000 jobs. This growth could not have happened at this scale without Ireland winning and building out the data centres that accompany the business. Centres of excellence would not exist in Ireland without these facilities.

To quote Brad Smith, President of Microsoft: "Today we have data centres in other countries across Europe, but none is as large as our data centre campus in Ireland. It fills two square miles. Together with the large data centres run by Amazon, Google and Facebook, it has helped turn Ireland from a small island into a data superpower."

Furthermore, in this emerging data economy, companies follow the success of others. As a result of large tech investment, Ireland is always 'on the list' for digital investments by companies across all sectors. Technology is pervading everything from pharma to food to cars to services, and Ireland's credibility in this space puts it at the heart of that conversation as far as Europe is concerned. This is a high-growth industry where Ireland has a real advantage.

Benefit for Irish companies

The impact has been much wider than the billions of direct investments in Ireland and tens of thousands

of multinational jobs. Local Irish companies have won significant contracts outside the country. Around 80 Irish companies offer services in this space, not counting many companies who only supply local services, and Enterprise Ireland estimates that Irish firm exports annually are around €2 billion in the data centre market across all suppliers. This would not have happened without the presence of foreign direct investment in Ireland. The Construction Industry Federation estimated that, in 2016 alone, Irish construction firms had €2.2 billion of contracts for data centres outside Ireland. When compared to €3 billion of food and drink exports (Ireland's longest established industry), it's evident that this is an industry of growing scale for Ireland less than 20 years on from its starting point.

As Irish firms built Europe's first world-class data centres in Ireland, they continue to win an outside share of business elsewhere based on experience and reputation. This is one of a few areas where Ireland can claim a world-leading position that is important to a global-leading industry. It has provided a global market for great Irish companies and good jobs for its people.



Towards a sustainable future

Data centres are often mentioned in the same breath as growth in Ireland's energy or water demand – frequently in a very negative context. EirGrid has published figures which show different scenarios for growth in the coming years and data centre load is certainly a large component. Technology-related energy growth is a global phenomenon, primarily driven by those digitised products that we increasingly need. Ireland has set some of the most ambitious targets in the world for renewable electricity, aiming to reach 70 percent of supply from renewables by 2030. This plan was created with a full awareness of data centre loads. It will be challenging to achieve, but data centres are already contributing positively. Operators of these facilities intend to achieve the highest possible standards on all measures of sustainability

and hold themselves to high account for both their own sake and the demands of their customers.

In line with this all the “hyperscale”, data centre operators have committed to becoming 100 percent renewably powered by 2025 globally, a more ambitious target than those set in the Irish plan. Ireland can harness that intent to assist with achieving its own goals. Amazon provides an excellent example of what's possible in Ireland, purchasing power from three projects in Donegal, Cork and Galway totalling around 230 MW of power output. Crucially these projects are not subsidised by the Public Service Obligation (PSO) levy. Facebook announced a similar project during August in Tipperary. This can certainly continue and have impact if the right conditions exist in Ireland as data centre companies continue to invest in sustainability to achieve ambitious renewable energy goals.

Some commentators have mentioned future costs of renewables related to data centres. What is often missed is that some commentaries have included the full cost of new renewable projects such as wind and solar farms. These are not direct state investments but private ones that are paid for by the people who buy the energy. They also represent jobs and investment in the communities where they are built.

That said, any industry worth having requires investment and robust, sustainable infrastructure, be that water, electricity, roads or land and buildings. The costs of these infrastructures are recovered by regulated rates from users including data centres. Investment generates jobs and future prosperity – it is important to weigh up the benefits as well as the costs of an industry for the infrastructure it requires and to understand the full context for it including economic and societal benefits.

Ireland at the heart of Europe's digital economy
Ireland's network of datacentres and cloud providers is an infrastructure that enables a large part of Ireland's and Europe's digital economy. It is one of the reasons why an island on the edge of Europe is such an attractive place for skilled people to develop a career or establish a business in technology. Because of Ireland's great talent, capability and years of hard work, the country was fortunate enough to get in on the ground floor of the cloud and data centre industry. That digital industry is driving towards a sustainable future.

The incredible companies that invested in the country have, through their faith in Ireland, built a base that is envied on a global basis. Irish companies and people have subsequently benefited from exports and high value jobs. This industry is one of the fastest growing in the world and has recently become even more fundamental to all our lives. As the world's reliance on technology and data progresses, the best is yet to come for Ireland and its place in the digital economy.



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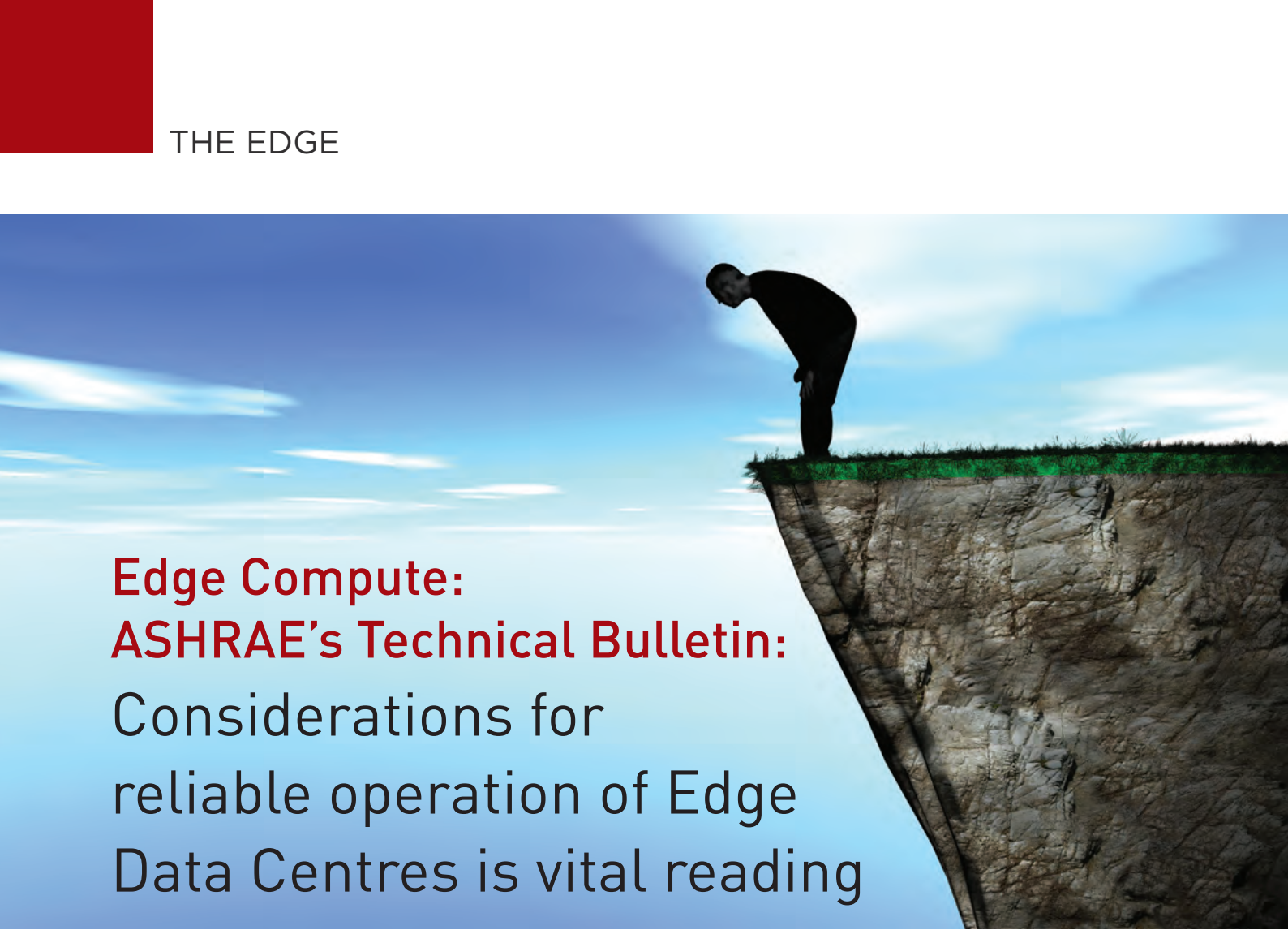
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Edge Compute: ASHRAE's Technical Bulletin: Considerations for reliable operation of Edge Data Centres is vital reading

IT equipment is fragile – exposing it to the elements will create unacceptable risk. Liquid cooling should be a key consideration for everyone implementing Edge data centres

BY DAVID CRAIG, CEO, ICEOTOPE

SOME EDGE DATA CENTRE NETWORKS will be built using mass produced commoditized units which pop up in shops, factories, transport hubs, streets and roof tops in cities and countries across the world. Edge data centres will also come in many different form factors, right-sized to their use and location.

What won't change, in most cases, is the IT equipment that sits inside these various edge data centre designs. This will comprise the mass-produced processor, memory, storage and networking components that currently populate the world's environmentally controlled data centers.

The reasons for this are scale and economics. Creating hardened IT equipment, like the telecoms industry did decades ago, for every type of edge data centre and every type of environment is simply not economical at this time. While the IT equipment components within edge data centres will be the same standard IT gear operating in IT cupboards, server rooms and hyperscale data centers, the equipment and the data it processes, and stores remains no

less valuable but is subject to a variety of external influences that have been eliminated in enterprise and data centre environments.

Standard IT equipment is about to be rolled out at an unprecedented scale. But unlike say, industrial equipment or telecoms gear this kit is not hardened or built to official standards for use in uncontrolled or semi controlled environments. This means that as standard equipment is placed in non-standard environments efforts to avoid unacceptable failure rates must be addressed now at the design stage.

Right Sized, Not One Size

ASHRAE TC 9.9 has taken time to evaluate and consider the design and operation of edge data centres in its latest technical bulletin. <https://www.ashrae.org/about/news/2020/ashrae-technical-committee-release-technical-bulletin-on-edge-computing-design-and-operation>. It provides a detailed dissection of the hazards to reliable operation of edge data centres. Technical Committee 9.9 is the committee which established the temperature



guidelines for efficient data centre operations in 2004, which have become the de-facto standard for data centre design across the globe, and it continues to monitor and update them regularly.

The latest bulletin begins by outlining some of the new demand drivers such as IoT and AI data and workload types such as remote learning, 5G and telemedicine, and concludes edge data centre form factors will not be standardized. There will be some uniform mass-produced units and there will be a range of different enclosure types. These will scale from small street furniture type enclosures to large containers which may be deployed in semi-controlled environments such as factories or warehouses. There will also be small brick-built dwellings which might accommodate mantrap access and environmental controls.

In whatever form factor is chosen there is no escaping the fact that edge data centres are bringing IT equipment out of the protected, environmentally controlled data centre technical white space and into challenging and harsh real-world scenarios.

Getting Under the Skin of Edge

ASHRAE's considerations include warranties for IT equipment, maintenance regime considerations including temperature, humidity, pollution and condensation. Many of these edge data centres will be protected by a single skin which risks exposing sensitive IT components to the elements whenever access is required. The Bulletin states: "Scope and Problem Statement - Will any of the following occurrences impact the IT equipment performance, reliability, or manufacturer's warranty?"

- **Cold Day** - What would happen to the inlet airstream to the IT equipment if the door was opened on a very cold day (i.e., -5°C, 23°F) that was below the specified limit of the IT equipment?
- **Air Pollution** - What if, opening a door allows high levels of air pollution to access the interior, this could initiate corrosion?
- **Dust** - What if, the data centre was located in a dusty climate where air coming in through an open door bypassed the filtration system?
- **High Humidity** - What if, a service needed to be done on a rainy day when relative humidity was close to 95% rh, i.e., above the IT equipment's specified limit?"

The bulletin offers excellent advice for the design stage about right-sizing your different edge units for application variances and differing servicing and maintenance approaches. ASHRAE does not tell IT equipment makers how to design components, processors, memory or hard drives. It is simply addressing edge in the context of standard IT equipment being deployed in non-standard environments. These are new scenarios which are harsh by nature and where IT equipment must be protected from the possibility of soaring failure rates.

You Can't Control the Weather, but You Can Dress for It

Standard IT equipment is about to be rolled out at an unprecedented scale. Unlike industrial systems or telecoms gear this IT equipment is not hardened or built to standards for even semi controlled environments. The economics within the IT supply chain and speed of roll out of edge will dictate that for some time to come standard equipment is implemented in non-standard environments. Treating edge data centres as though they are controlled environments by blowing air across equipment to keep it cool introduces many hazards and is a risky way to proceed. Efforts to avoid unacceptable failure rates must be addressed at the earliest stages in development.

It is possible to design your edge data centre, so units are cooled by a technology which guarantees IT equipment is impervious to heat, dust, humidity and other contaminants. A chassis level liquid cooled solution which is energy efficient, fully sealed and operates efficiently for years without the regular intrusive high touch service and maintenance regimes provides the reliability at the edge, which is currently only available in controlled data centre environments. The huge number of units to be managed in any edge network means regular intrusive maintenance is simply not practical or economic. Not least because the act of servicing itself introduces heat, cold, pollutants and humidity variations into the equipment which may void the warranty conditions of sensitive equipment.

Edge data centres by their nature will be exposed to the elements. However, that does not mean that the IT equipment operating within cannot be protected. Chassis level liquid cooling solutions directly address many of the challenges and considerations raised by ASHRAE's TC 9.9 bulletin.



What are the prospects for WANs in 2021?



It's often advisable to look back before stepping forward. While the adage is that history often repeats itself, hindsight is still an invaluable tool, as it allows us to learn from our mistakes. The key to success is then to apply the lessons that have been learnt.



BY GRAHAM JARVIS (LEFT TOP), FREELANCE BUSINESS AND TECHNOLOGY JOURNALIST, AND DAVID TROSSELL (LEFT BOTTOM), CEO AND CTO OF BRIDGEWORKS

The WAN, SD-Wan and WAN Optimisation trends of 2020 can therefore enable us to make adjustments and improvements – even during the current Covid-19 pandemic. Despite this, IDC predicts that shares in the SD-WAN vendors will increase: “COVID-19 has caused enterprises around the globe to reassess their distributed network architectures, with a specific focus on enabling efficient connectivity between remote workers and cloud-based applications,” says Brandon Butler, senior research analyst, Network Infrastructure.”

He adds: “SD-WAN technology helps enable next-generation edge networking architectures for enterprises, particularly the ability to dynamically manage multiple WAN connection types via a centralised policy controller. Meanwhile, the integration of security functionality natively integrated into SD-WAN platforms continues to make this technology an important investment priority for large, distributed enterprises.”

Exploring innovation

While the vendors may be confident of growth in 2021, it's crucial – particularly if your organisation needs to increase the performance of its Wide Area Networks (WANs) - to explore whether there are technologies available; or in ongoing development, technology that can improve the mitigation of latency and packet loss, while improving bandwidth utilisation.

To this end, David Trossell, CEO and CTO of Bridgeworks, comments: “Being software defined, and with its associated lower cost of entry into the market, there have been several new entrants into the SD-WAN market over the past few years.” He explains that this acceptance is occurring at a moment when SD-WAN is starting to penetrate some of the large corporates driven by the pandemic: “Some of the

more established players have been scooped by the big network and system providers, such as VeloCloud with VMware, DELL EMC. This provides a level of legitimacy and comfort to the larger organisations. Like many technologies that have gone on before, we will see a continued increase in players, only to see them fight for a dwindling market share until the money runs out.”

Work from Home

Due to the pandemic, there is a need to service the ‘Work from Home’ user (WFH), too. Trossell finds that this has driven much of the expansion of the SD-WAN market. Why? Because of its “ability to use lower-cost broadband connectivity to connect these WFH users, rather than the more secure and reliable legacy networks that take time and money to expand.”

He says there is an interesting twist in the market. He explains: “The increase use of SD-WAN in the Security as a Service. This is where a local point of presence is used to provide VPN to secure dedicated global network to provide a higher level of security for those companies that require this facility and comfort.”

SD-WANs, he says, will enable enterprises to scale-up to the faster bandwidth option “that are now becoming available at lower costs and in more remote areas.” He adds that this is going to become key to enable hybrid work patterns, where some of the time is spent working from home, and – depending on Government Covid-19 restrictions, to what extent people begin to return to work, at least part of the time, from their offices.

He thinks the prestigious corporate headquarters will remain, albeit perhaps scaled down, but there will be the increasing emergence of the Edge Office to maintain an esprit de corps. However, he thinks this approach will reduce “the burden of the traditional

expensive and long commute that many workers have experienced but are now re-evaluating.”

SD-WAN: “Here to stay”

So, what will be the SD-WAN and WAN Optimisation opportunities and threats in 2021? He responds by commenting: “Because of its flexibility and reduced management overhead, SD-WAN is here to stay for the foreseeable future. We are starting to see the use of AI creeping into the product, which will be a game changer in terms of management and performance.”

The drive to standards across the SD-WAN market, driven by the MEF organisation, will be key to the long-term success of the SD-WAN industry, but will drive forward the adoption of SD-WANs. As for WAN-optimisation that is part of many SD-WAN product sets, this is another matter.”

Biggest performance killer

Trossell explains that latency is the biggest performance killer of any WAN. Adding packet loss to latency will make it difficult to attain 30% unitisation with 20ms of latency. He adds: “Yes, WAN optimisation can help this but as we move up from 1Gbps SD-WAN installations, all of the benefits of lower overheads can be lost to the overheads of the WAN-Optimisation function. This is coupled with the move to more file formats that tend to have poor deduplications factors, such as videos, pre-duped data from application or encrypted files.”

Does this mean that WAN Optimisation has had its day, or does it still have place organisations’ IT and networking toolbox? WAN Optimisation can provide great user experience over poor quality low bandwidth networks. However, he thinks that this is “waning with the ever-increasing availability of higher speed, lower cost connections in remote regions, with the use of satellites and 5G and broadband coupled with the of SD-WAN.” So, in his opinion, pure WAN Optimisation will be slowly replaced.

He adds: “However, we do start to hit a few barriers to SD-WAN technologies as we move up the ladder of increasing bandwidths that are coming onto the market at ever reducing costs. Looking through many of the providers of SD-WAN, it is difficult to get a clear picture of exactly the bandwidth capabilities of these products. Whilst some of the large providers such as DELL, publish this information about connectivity.”

Improving SD-WANs

There is, nevertheless, a need for SD-WAN



performance to improve, if SD-WANs are to remain relevant by moving up the bandwidth ladder. Trossell predicts that many enterprises will look to replace their existing WAN connections at the lower scale, and they will be looking to drive these into more demanding high-performance areas.

He explains: “As we all know, there is a limit to the bandwidth capabilities of WAN-Optimisation, but latency and packet loss are still presently killing the performance – as we increase the bandwidth the effect is greater! To make the most efficient use of SD-WANs and the underlying WAN infrastructure, we now need to employ WAN Acceleration with them, as with the SD-WAN, it has a low overhead even at the high Gigabit network connections we are now seeing.”

Enabling the edge

So, how can WAN Acceleration transform and enable edge networking architectures and cloud-based applications? Well, first of all, Trossell explains that the term ‘edge’ is now being used for “a multitude of scenarios these days: from edge computing to edge workers and edge offices. He says the Internet of Things has been a catalyst for edge computing, as there is a need to move closer to IoT devices – including connected and autonomous vehicles (CAVs). This



is because being closer to the source of the data provides a low and immediate latency response.

He adds: "However, at some point, everything has got to come back to a central point for correlation - "No edge is an Island", to misquote the phrase. But these islands will typically be at some distance or consist of latency from the core that could affect the transfer rate considerably. If data immediacy is a priority along with security, as in some financial cloud applications, then WAN Acceleration, on top of SD-WAN, will give the best of both worlds."

Circular motions

Trossell comments that everything goes in circles. IT included, and so there is the question about what will define the next IT strategy: new or old technology, new or old network infrastructures, increases in bandwidth, or a solution such as PORTrockIT to enable the mitigation of packet loss and latency, while increasing ingress and bandwidth utilisation – using the infrastructure.

The human element of changing work patterns will lead to transformational IT strategies, and this has been seen in how enterprises and their employees have adapted during the pandemic. An example of this, given that remote working has been shown to be viable, is Aviva talking about its staff

working from home as a policy going forward; with hybrid working supported by artificial intelligence to support remote workers who engage via edge hubs.

So, where does this leave WAN Acceleration and SD-WANs? Trossell concludes that WAN Optimisation was once a game changer when it was first introduced. Bandwidths have since escalated, data volumes have grown "out of all proportion", and he says there is now a different and wide-ranging mixture of data formats to contend with.

WAN Acceleration future

He explains: "Everything was previously managed by expensive dedicated switches. If we want to step up to the challenges of the new post-Covid world, we have to change. SD-WANs are one part of the puzzle – the software-defined approach is efficient, scalable and cost-effective. Likewise, WAN Acceleration, with its software approach that is data agnostic, has no requirements for cached disk storage that is part of traditional WAN- Optimisation."

Consequently, he predicts that in 2021, joining these WAN Acceleration and SD-WAN technologies together could make an immensely powerful combination, and one that enterprises should seriously explore before investing solely in new SD-WANs.

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Five ways SD-WAN can support retailers' digital transformations

These digital strategies can help merchants enhance the customer experience and stand out from competitors — now and in the future.

BY JOHN TAIT, GLOBAL MANAGING DIRECTOR, TNS PAYMENTS MARKET



THE COVID-19 pandemic has forced retailers across the globe to rapidly adapt their tried-and-trusted business models to meet the new and shifting needs of their customers. With consumers changing how they shop for, pay for and receive purchases of all kinds, it's the retailers that were more progressed in their digital transformation journeys that have been better able to weather these changes to consumer buying habits. Even post-pandemic, retailers who have invested, or are investing, in digital capabilities will be positioned to create customer experiences that help them stand out, using technology-based strategies.

To support these future strategies, however, retailers must implement a connectivity foundation that is more secure, more scalable and more reliable than the traditional MPLS model. For any retailer with more than five locations and more than 100 employees, software-defined wide-area networking (SD-WAN) can provide the connectivity backbone that allows business workflows to remain agile and perform optimally.

Because SD-WAN can connect dispersed locations over multiple geographical locations and use the best network route available at any given time, it allows different

types of network traffic to be prioritised as needed. This provides for redundancy and a seamless user experience, but it also allows retailers' networks to be more dynamic. For example, using a combination of managed wireless and IP connectivity with SD-WAN instead of purely MPLS can lower or eliminate circuit costs for retailers operating in a mix of rural and urban markets.

Diversity of managed communications, combined with the intelligence of SD-WAN, can improve cost and uptime, which reduces the risk that POS terminals will go down and business is not interrupted. It can be layered on top of any connectivity solution to securely connect users with applications, including those in the cloud. SD-WAN offers retailers the connectivity capabilities they need for in-store and e-commerce digital transformation initiatives. Here are five strategies it can support.

1: Offer customers free Wi-Fi – and use it to gain insights

While not all consumers will return to shopping in physical stores, it is likely that most of them will. After all, plenty of people like to see options in person, browse, find deals they might not see on a website, or just get out of the house. And wherever they go, consumers will expect to have



connectivity, which means free Wi-Fi is becoming a must-have for retail sites.

SD-WAN enables retailers to securely add on a free Wi-Fi solution for customers without affecting the connectivity layer that supports payments terminals or other digital initiatives in a store. And this free Wi-Fi isn't just a perk for customers, retailers can harness analytics from the Wi-Fi to obtain valuable insights about shoppers' patterns, behaviours and preferences.

For example, Wi-Fi analytics can tell retailers whether the customer is a first-time or frequent visitor. Wi-Fi analytics can demonstrate how much time a shopper has spent in the store and where in a store they spent it, as well as aggregate data about overall shopper behaviour. Using this aggregate data, retailers can revamp their store layouts to increase sales by highlighting popular items, placing less popular items near better-selling ones and positioning promotional or add-on purchases near frequently travelled areas.

2: Engage with customers digitally

Even if some consumers aren't physically coming to a store, they still want expert opinions, so some retailers have started to implement digital concierge services. Consumers can still have the same white-glove experience they'd get in a physical store by being able to ask questions and view options via video conferencing.

This is a trend that may continue after the pandemic, especially for products that require highly specialised knowledge like diamonds or audio-visual equipment. Retailers can use their best experts to virtually help customers all over a region rather than staffing people at every location. SD-WAN can help manage high-bandwidth applications such as live video and clear audio and video by optimising network traffic.

Other retailers have moved away from "try-before-you-buy" tactics for safety and hygiene reasons and toward augmented reality (AR) solutions. For example, some beauty stores no longer allow customers to try out a new lipstick shade by applying a sample to their lips, for hygiene reasons. Instead, stores can use AR mirrors that show the customer what the lipstick looks like on them — touch-free. Delivering responsive, smooth AR requires both sufficient capacity on the network and the ability to manage traffic, to protect the AR traffic from jitter and packet loss.

3: Use smart cameras to rethink store layouts

Today's security cameras aren't just useful for catching break-ins and providing surveillance. New always-streaming smart devices can capture shopper patterns that can drive strategy and improve decision-making. Retailers can see what's happening at their physical locations, observing foot traffic patterns and gauging customer reactions to learn more about

Consumers haven't stopped buying, but they have changed the ways they shop and pay for goods, with many turning to e-commerce, mobile apps or curbside pickup

shoppers' preferences and their intent to purchase. Cameras can provide actionable insights to improve in-store offerings, maximise the placement of sales associates and in-store displays and even develop individual promotions. While tying these into a store's analytics and network means there are even more devices on a retailer's network, SD-WAN allows retailers to manage traffic to avoid a network from overloading.

4: Accept and securely support omnichannel payments

Consumers haven't stopped buying, but they have changed the ways they shop and pay for goods, with many turning to e-commerce, mobile apps or curbside pickup. This new desire for a variety of payment and buying options isn't going away, and retailers must deliver on it. SD-WAN's ability to expand connectivity over a wider area allows retailers to take payments in more places — outdoor terminals, pay-at-the-pump options, self-service kiosks and even via mobile POS terminals, like tablets.

While flexibility in where and how payments can be processed is ideal for the consumer, it can create cybersecurity risks. This is because more payments devices mean more points of interaction to and from apps or internet breakout. Proper security controls, especially for payments, are critical.

SD-WAN enables retailers to securely connect all types of payments options, as well as any other devices and networks within a retail environment. Depending on the equipment and/or vendor, SD-WAN can also protect sensitive personal and financial data and traffic, which is key for the retail industry. Regulatory compliance with PCI DSS security credentials is, of course, also critical within a retail environment, and some SD-WAN solutions available today have been designed to incorporate PCI DSS requirements.

5: Optimise the supply chain and inventory systems

The supply chain issues that some retailers experienced earlier in the COVID-19 crisis demonstrated the importance of being able to efficiently manage supply chains. Especially as



shoppers demand more e-commerce options and faster delivery, retailers must be able to quickly perform inventory checks, automate orders for high-demand stock, and track orders in real time. SD-WAN can help retailers streamline operations and eliminate any network downtime, so all systems stay up and running.

What's more, several retail giants have begun to blend their stores and inventory centres, which suggests that the lines between brick-and-mortar and e-commerce will become even more blurred. For example, while big EU-5¹ retailers such as Tesco and Carrefour have expanded online with in-store inventory, Amazon – the original e-commerce company – has been rolling out physical stores in select cities.

The good news is that retailers don't need to be a global brand to exploit the advantages of connecting their business over SD-WAN. SD-WAN helps mid-sized merchants who want to set up a mobile order/e-commerce fulfilment centre, a ghost kitchen to expand service areas or a seasonal kiosk location to test demand before committing to real estate.

SD-WAN allows retailers to interconnect these new channels and locations in days rather than months through fast deployment of equipment and connectivity.

This means retailers can gain a larger yet flexible footprint without committing to another fully outfitted customer-facing storefront. And by prioritising bandwidth-intensive retail workloads, such as retail analytics and inventory systems, SD-WAN can improve bandwidth efficiency and optimise inventory operations and productivity.

Prepare for a new future

To support continued digital transformation, remain agile in the face of change and improve in-store and e-commerce customer experiences, retailers need to simplify, secure and improve their network across all branches and locations. SD-WAN can consolidate point solutions, simplify network management, provide visibility into data applications, and support new bandwidth-intensive digital strategies, all while supporting business-critical applications so that payments stay up and running.

However, some retailers may be challenged to implement this technology, either because their in-house IT staff doesn't have the time, or because they don't have in-house IT. Fully managed solutions can help in this instance: they remove the hands-on work of deployment while giving a business all the capabilities of SD-WAN, allowing retailers to focus on transforming the customer experience, not their network.

¹ EU-5 countries of France, Germany, Italy, Spain, and the United Kingdom



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Your users have moved, but you still need network monitoring because your infrastructure hasn't

Remote working is here to stay - maybe not as widespread as it is today but at a much higher rate than before. As the global pandemic set in around the world, enterprises were forced to send most, if not all of their workforces home. As they did, they onboarded unprecedented numbers of employees into remote working.

BY MIKE CAMPFIELD, VP, GM INTERNATIONAL AND GLOBAL SECURITY PROGRAMS AT EXTRAHOP



THIS TRANSITION cemented a long standing trend. A report by Flexjobs and Global Workplace Analytics showed that remote work has grown by 159 percent over the last 12 years. A Gallup report called The State of the American Workplace - carried out between 2012 and 2016 - showed that 43 percent of American employees already worked remotely at least part of the time.

That said, the recent massive move to remote work was still a shock to the system. Though remote working was building in popularity pre-pandemic - enterprises were not prepared.

For organisations already moving towards remote work, it was a bit easier but by no means simple. New challenges surfaced to ensure employees had the connectivity they needed at scale and created new performance and security issues around connectivity including VPN, RDP, and more. New insight into how and what employees were accessing on the corporate network from home and the tools they were using brought about new visibility requirements. At a time when many were already struggling to see and understand their existing internal activity - chaos was the norm.

It quickly became apparent that additional oversight was needed on everything from printers and other connected devices left on in the physical office space, to the large increase in VPN connections, and employees accessing the corporate network from personal devices. This challenge to see all of

the transactions that traverse the network, let alone understand if they are authorised access or malicious activity became a much higher priority. These challenges will continue to morph as a hybrid and transitory workforce emerges. Employees will return to the office but most likely for a few days a week or a few days a month and be constantly connecting from both inside and outside of the corporate network. This will continue to raise the risk of unmonitored connections and activity that has been widening the attack surface.

The Cloud

The advent of remote working has had the parallel effect of deepening some organisations' commitment to the cloud while accelerating others' moves to the cloud. The move towards cloud provides flexibility especially in times when access to the physical data centre is limited. On the one hand it's easier to access your cloud resources from anywhere and provide teams with solutions faster, however, the cloud has also added additional visibility and security challenges.

Cloud misconfigurations are the most common security mishap which can go entirely unnoticed until something bad happens as a result. A McAfee survey from 2019 predicted that the average organisation suffers from around 3000 cloud misconfigurations a month. Each one of them presents a potential vulnerability that could result in a breach or data leak for that enterprise.



The ephemeral nature of the cloud means that cloud instances are easy to spin up without control or oversight. Enterprises looking for secure migration to the cloud will need to monitor crucial network data which can be accomplished by mirroring that traffic from your cloud provider to a network detection and response solution. With that final piece in hand, enterprises can gain needed visibility into the cloud and combine those insights with their own network data to create a unified vision of the network.

Safe remote work is held up by network data.

The remote work revolution can only be ushered in safely with thorough network visibility.

While many were forced into enacting remote work for the entire workforce, they've also been won over by it. There are a myriad of benefits to it. Employees report better productivity and increased job satisfaction and talent sees it as a competitive differentiator between potential employers. A recent Gartner survey of 317 CFOs found that nearly three quarters of companies are looking to move at least a portion of their on-site employees to permanently remote positions.

The tech giants of silicon valley have announced their intentions to ensure that their employees will be able to work from home "forever" if needs be. So too have UK financial institutions who have declared that their employees are unlikely to return to work in 2020 and are preparing for extending that capability indefinitely. If organisations opt to cement those transformations - then they'll be upending much of their pre-existing visibility infrastructure and will need to put measures in place to deal with their hybrid workforce.

One approach is to pay attention to what Gartner refers to as the Security Operations Centre (SOC) Visibility Triad. The three pillars of the Triad include, network data, endpoint data and log data working together to provide a much stronger network security posture.

While each solution on their own is not perfect, when integrated into a cohesive defence you can complete your security story. For example, it is difficult to know if all of your endpoints have been instrumented, like IoT, and endpoints can be tampered with. Log data can be overwhelming and attackers have been known to cover their tracks by modifying or deleting logs.

Network data when combined with other sources covers those potential blind spots and completes the triad. Network data is a passive source of data that can't be tampered with or turned off and is constantly watching all of the activity on the network. With all three solutions working together you can immensely improve your security posture.

When Network Detection and Response (NDR) is combined with traditional EDR and SIEM solutions, you will not only have complete visibility into everything connected inside and across your entire hybrid network and reduce your alerts to those that matter, you will also catch the threats that other tools miss.

The objective, unchangeable nature of network data provides the insights an organisation vitally needs into the internal traffic required for unified network visibility, ensures threats are detected and improves the security of your hybrid network.

Modernising networks to cater for the changing app landscape

It can be hard to bring the NETWORKS of networking into conversations at board level.

BY NICK CROSS, VICE PRESIDENT, NETWORK, SECURITY & AUTOMATION, EMEA AT VMWARE



IN MANY WAYS, networking is a victim of its own success - if networks are performing well, then they struggle to attract any attention – they just work transparently. Yet in the context of business-critical modern apps, networking is critical. These apps, and their supporting microservices, are becoming increasingly disparate and data hungry. And networks are becoming an integral part of them, acting as a mesh-like conduit tying everything together and delivering digital experiences to end users.

As workforces become increasingly distributed, and our reliance on modern apps, clouds and new devices increases, organisations need to recognise the

expanding role that a modern, transformed network plays in facilitating modern business IT and ensuring end user satisfaction.

Networking in the context of business-winning modern apps and data

Apps and their users are increasingly data hungry, and the nature of this data, and where it lives, has changed. Data is now much more disparate, spread from data centre to edge to endpoints, and everywhere in between. It's also growing, and fast. By 2024 more than three quarters of a billion applications will exist – a six-fold increase in just ten years.



The very nature of apps themselves is also changing rapidly. Traditional apps were monolithic slabs of code, usually existing on a single server. In this scenario, the network's main role was one of point-to-point connectivity. Modern, cloud-native apps are very different, however.

They are made up of a series of small individual modules – so called microservices – that can exist anywhere, and communicate with each other via the network to form the app. This makes the network in effect part of the modern app itself, marking an entirely new use case for networking.

End users' desire for feature-rich apps is also driving these changes, forcing developers to develop them at an ever-increasing speed. This requires new, mesh-like networks that seamlessly and automatically scale to everywhere that data and apps exist.

Most traditional network infrastructures aren't fit for this purpose. Organisations need a modernized network that is self-driving, scalable and agile, and meets the needs of modern business.

Networking in the context of deperimeterization

Security and networking have always gone together, but as threats have increased and the demands on networks have grown, we are seeing even faster convergence. As a result, deperimeterization – the blurring of an organisation's network boundary with the outside world – is becoming the norm to accommodate modern cloud-native applications, SaaS, remote working and so on.

Deperimeterization brings huge challenges, however. The first is complexity. With organisations implementing modern applications that often span on-premises, cloud and edge environments, it's extremely challenging for IT to manage application and service portfolios with any level of consistency. The second is an expanded attack surface - the increase in network communication between and within distributed applications creates more potential opportunities for breaches.

Delivering improved security via the network, rather than by a plethora of discrete point solutions, facilitates a universal 'zero-trust' approach to security, and the added intelligence, automatability and agility it provides. This is a key attribute of a modern network.

Key factors of a successful modern network

Modern Networking is a software-defined, virtual evolution of the traditional physical network, which leverages whatever existing infrastructure is available. It drives universal and consistent connectivity and delivering intrinsic security to modern and traditional



applications that meet user demand, at speed, by automating network and security policies.

A modern network consists of:

- **Modern app connectivity services**

A Modern Network uses capabilities such as service mesh so applications can communicate internally and with one another, and security models such as Secure Access Service Edge (SASE) to give networks the agility to adapt to changing business needs in real time.

- **Multi-cloud network virtualization**

A Modern Network needs to be self-driven and self-healing, using AI and ML to reconfigure networking and security policies regularly. This again is where SASE comes in, steering traffic on a packet-by-packet basis across multiple clouds and locations to achieve the highest quality of user experience.

- **Independence to the physical network infrastructure**

Software-defined networking is what delivers agility, but the underlying physical network infrastructure still plays a core role. Acting as a generic all-purpose platform, it is controlled by the overlay virtual network and can be reconfigured and rerouted to meet business requirements as needed.

Mastering a modern network to drive business success

Customer experience is directly linked to business success and is fed both by modern apps and the data that flows through them. Ultimately a modern network is designed to best serve the needs of the end user – be that the employee or customers.

It not only enables greater alignment with business outcomes, but also provides an indispensable, adaptable digital foundation to power the new, digital-first world.

The importance of adaptability in an increasingly complex world

Adaptability to changing conditions is a must-have trait for today's organisations, especially during today's uncertain world. Business leaders must prioritise adaptability as a must-have organisational trait, and as disruption accelerates, there is no guarantee that the biggest and toughest industry players will survive.

BY SARAH DOHERTY, PRODUCT MARKETING MANAGER AT ILAND



ORGANISATIONS that understand their environments and are positioned to sense change and adapt are the most likely to survive in the event of disruptions.

Adaptability: the fundamental goal of any business is to survive and thrive.

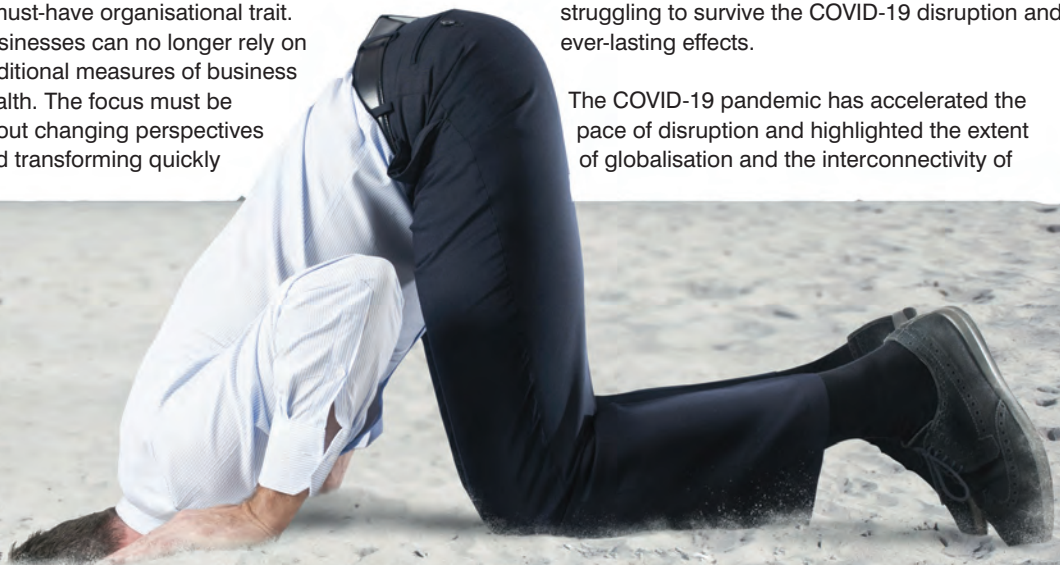
Today, no industry or company is safe from disruption, but many organisations are not prepared to adapt quickly enough to survive the effects of accelerating change.

For companies to position themselves for long-term success in this ever-changing environment, business leaders must prioritise and foster adaptability as a must-have organisational trait. Businesses can no longer rely on traditional measures of business health. The focus must be about changing perspectives and transforming quickly

and at scale to become adaptable today in order to survive tomorrow. One way that companies can start their journeys to becoming more adaptable and, therefore, more fit for an uncertain future is to adopt new perspectives on business sustainability.

Many business leaders still appear to believe that traditional indicators of market dominance provide an insurmountable competitive advantage. However, as the amount of disruption accelerates, it becomes more apparent that the biggest and "strongest" industry players are not always the most likely to survive. This has become increasingly clear as the pandemic has continued, with many companies, large and small, struggling to survive the COVID-19 disruption and its ever-lasting effects.

The COVID-19 pandemic has accelerated the pace of disruption and highlighted the extent of globalisation and the interconnectivity of



technology, business and society in ways never seen before now. This shift has also revealed the instability of many companies that were long seen as industry leaders.

Not all companies have struggled during the pandemic, however, some companies were lucky to be in the right place at the right time. For example, so-called “work from home” companies and e-commerce leaders. Others have remained stable due to a strong focus on resilience, financial stability and contingency planning. In addition, there are those that have used the crisis strategically to innovate their business models for growth. In all cases, these organisations have demonstrated the uncommon ability to adapt quickly to the changing environment. With the right planning and fortitude, these companies are uniquely positioned to compete during uncertainty now and in the future.

The future health of any organisation will rely on many things, with differences varying due to geography, industry and even business type. Still, the common thread is to focus on transformative business drivers to stay fit while gaining dynamic competitive advantages.

- **Consider the human factor:** focus on all business stakeholders by designing business models, products, and services.
- **Drive innovation:** be prepared by exploring

innovations before disruptions occur while promoting organisational cultures that reward innovation.

- **Deploy technology quickly and efficiently:** develop a strong digital transformation strategy to keep pace with technology advancements and ahead of any potential disruption that may occur.

These qualities will be trademarks of any adaptable and future ready organisation. This preparedness will provide the ability to move quickly and adapt to changes in customer demands, technology advancements and unsettling competition better than those that rely on size and efficiency alone. Many additional internal and external reasons may hinder a company’s ability to adapt, but better planning and transforming can serve as a guide for leaders hoping to avoid the same mistakes that have led other companies to the brink of disaster.

When it comes to cloud adoption, organisations need to source a cloud service provider to help plan and execute the much needed strategies for a smooth and easy transition to the cloud. Disruptions occur at any time and the right cloud service provider will deliver the desired peace of mind that your data is ready and available at all times in order to keep your business running while also avoiding consequences from a disruption.



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DCS **DATA CENTRE SOLUTIONS**



Sustainability

it's all about the data



The data centre industry is under increasing pressure to improve its environmental performance.

**BY ANDY CONNOR – CHANNEL
DIRECTOR, EMEA, SUBZERO
ENGINEERING**

IN 2020, the Uptime Institute's, Andy Lawrence stated, "The average power usage effectiveness (PUE) ratio for a data center is 1.58, only marginally better than 7 years ago."

This revelation may come as a welcome shock, and while it might be overstating the situation to characterise data center energy usage as the Internet's 'dirty secret', there's little doubt that the reality of the sector's carbon impact has been masked by the many headlines which focus solely on its sustainability successes.

Colt Data Centre Services, for example, recently announced that its operations across Europe are now fully powered by 100% renewable energy, while many members of the U.S. hyperscale community are publicly revealing their latest renewable energy projects and initiatives. Carbon offsetting is another idea quickly embraced by end-users, vendors and operators of all shapes and sizes, and while all of these activities, in part, contribute to data center sustainability improvements, they do not directly address the issue of data center power consumption.

Data Center Power Usage

Today there are many estimates as to the amount of power that data centers across the globe consume on an annual basis. Energy Innovation estimates that, in 2018, data centers likely consumed 205 terrawatt-hours (TWh), which equates to 1% of total global electricity. However, the authors of a paper published in 'Global Energy Interconnection' in June 2020 state that 'data centers will become the world's largest users of energy consumption, with the ratio rising from 3% in 2017 to 4.5% in 2025'. The data differs again in the January 2020 Uptime Institute Journal, which reports EU data center energy consumption figures of 130 TWh in 2017, alongside Greenpeace's 2018 Chinese data center figure of 160 TWh, which makes for a combined total of 290 TWh for China and Europe alone!

The fact is that as data center capacity increases, so will energy usage. And while we may not agree on the exact numbers, few would argue about the direction of travel. So what can we do to change the trajectory, and how can we begin to pinpoint consistency within sustainable strategies?

A Change In Demand

Demands for digital transformation are a key factor behind data center energy consumption, but rather than overload you with a tsunami of data, I would urge you to take a short time out to consider just how essential information technology has become to almost every factor of everyday life.

Take a typical workday, how do you communicate with colleagues, what does your role entail? Then think about your plans for the weekend (lockdown notwithstanding), have you thought about the films you'll watch, the apps you might use, or your personal connection to a data center?

Now try and imagine a future that also includes artificial intelligence (AI), augmented (AR) and virtual reality (VR), what impacts will this digital consumption have on the data center industry, and what does it mean for sustainability?

Those are big questions, many of which people outside the sector won't have considered, but the answer may lie within a recent data center industry initiative to show us the way forward. Recently 25 companies and 17 associations across Europe joined together to sign the Climate Neutral Data Centre Pact, with the objective of making data centers climate neutral by 2030.

There's clearly a growing momentum behind sustainability, but the industry needs to move beyond the environmental easy wins of the past few years

and to start to address the factors that really address efficiency and PUE ratings - those which have hardly changed in seven years.

There's also the question of is PUE truly enough to measure our carbon impact, so with this in mind, where can we begin?

Beginning With The Data

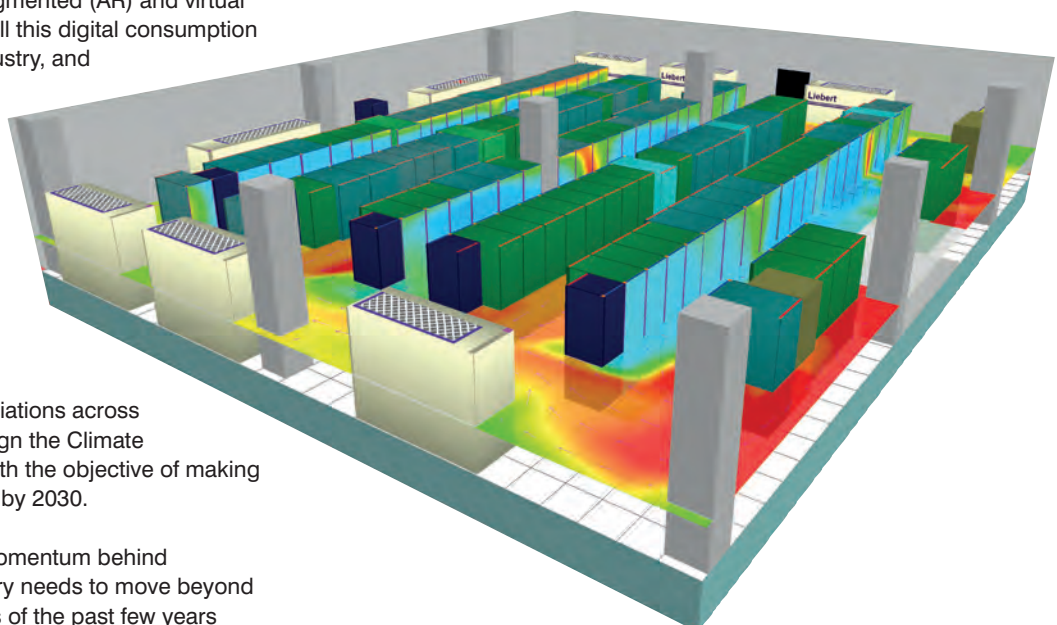
Back in 2005, Subzero Engineering started life as a Computational Fluid Dynamics (CFD) consultancy. At the time, a large percentage of the industry were using raised floors and experiencing issues with leakages. Yet, with a simple to use and accurate software solution we were able to show customers how they could analyse their data center infrastructure and take steps to both improve efficiency and reduce their environmental impact.

Fast-forward sixteen years and that approach has stayed with us. Today we're an engineering-led solutions provider that helps world-leading businesses achieve a lower carbon footprint, greater efficiency, reduced operating costs and exceptional performance - and it all starts with the data.

For example, by showing customers the hot and cold air influences within their data center and helping them to analyse, optimise and retrofit their facilities, we believe we can help them find the perfect balance between sustainability and performance.

The proof is in the outcomes and today we keep a live record of the annual energy savings we've achieved for our customers. To-date they include:

- Total savings: \$332M
- Total kW savings: 356kW
- Total kWh savings: 3BN kWh
- H₂O savings (gallons): 1.5BN
- CO₂ reductions (tons): +3M





However, while these data points show some of the gains that can be made by focusing on sustainability, two questions remain; how do organizations become more energy conscious, and what are the next steps they can take to become more sustainable?

Defining Next Steps

At Subzero Engineering we believe that beginning with a data-driven CFD report is the first step, and offers data center operators insight into how to drive efficiencies across all areas of their facility. This is not limited to airflow; it includes the Uninterruptible Power Supply (UPS), Computer Room Air Conditioners (CRAC), racks, IT and cooling fan speeds.

A CFD analysis also shows them how they can achieve a higher rack density, more computing power and help increase the operating temperature to gain both a higher performing and more streamlined, efficient data center.

This information is invaluable, offering both a starting point and a medium for creating a strategy that balances performance and efficiency. It also offers a means of truly understanding what kind of return on investment (ROI) they can expect from improving

sustainability, especially in terms of reductions in energy and water usage, and lower carbon emissions.

Looking Forward

Today energy efficiency and sustainability objectives have become key drivers for owners and operators. Subzero has always been a sustainability-engineering organization; it just so happens that in recent years 'sustainability' has become a key talking point for the industry.

Coming back to the data, a paper authored by Anders S.G. Andrae once presented three possible scenarios for data center electricity usage (TWh) by 2030. The best-case figure is 1,137; the expected figure is 2,967; and the worst case is 7,933. As an industry we cannot let the latter become a reality.

In the absence of the grown-up sustainability conversation that needs to happen soon, where more businesses and consumers become fully aware of the environmental consequences of their digital footprint, I believe more and more pressure will force our industry to perform better. Sustain Xability, however, begins with data-driven action, and a free CFD analysis is a perfect place to start.

Data is one of the most valuable resources we have, but how do we secure it?

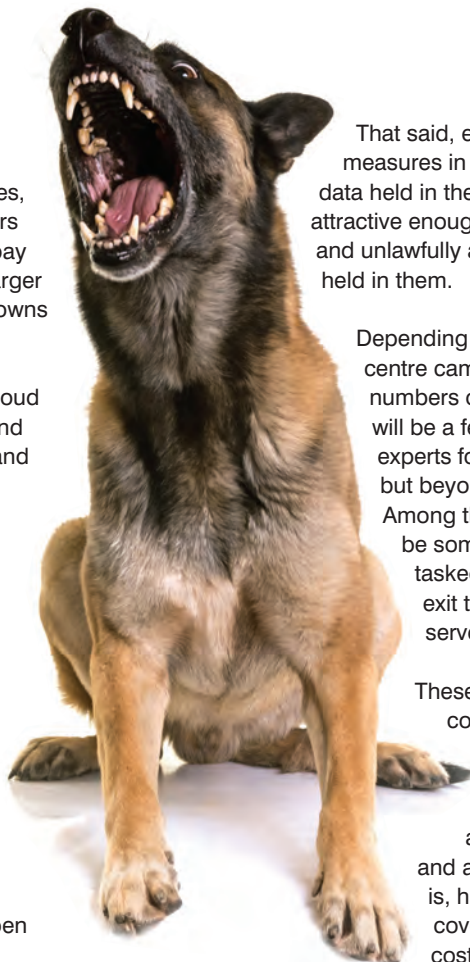
Since the advent of the internet, data has become an increasingly important resource for our businesses and our society. Almost every facet of our daily lives, from the messages we exchange with friends and family on our phones, to the applications we use to do our jobs, involve data. However, as important as it is to us, we rarely think of where it is kept and how it is secured.

BY NICOLAS BILLECOCQ, COO AT AZUR DRONES

THE REALITY IS that most data is stored, processed, and analysed in server in a data centre. In some cases, companies will have their own servers in their offices, but the majority will pay to rent or own server capacity in a larger multi-tenant site that someone else owns and operates.

Keeping data in a data centre – or cloud environment – has significant cost and efficiency advantages over owning and maintaining your own infrastructure, but one of the other key factors to consider when choosing where to locate one of your most precious resources is security.

For the most part people have accepted that a dedicated data centre is a safer place to store data and run workloads than servers kept on-premises – they reduce the number of people who can access servers and have fairly rigorous security procedures to ensure that only those authorised to do so can get in to server rooms, open cabinets, and access the racks.



That said, even with these security measures in place, the value of the data held in these sites can, for some, be attractive enough to try to bypass security and unlawfully access the servers and data held in them.

Depending on its exact set up, a data centre campus won't typically have large numbers of personnel on site. There will be a few engineers and technical experts for "hands and eye" cover, but beyond that not many more staff. Among those few additional bodies will be some dedicated security agents, tasked with monitoring entry and exit to the site, as well as to the server rooms themselves.

These agents will be complemented by some more sophisticated security measures, such as key-carded or biometric entry and exit, video surveillance, and alarm systems. The question is, how sufficient is that security cover and how much does it cost?



In recent years, advances in certain areas of technology have made novel solutions to this problem much more viable. One such solution is to replace or supplement some of the traditional security measures with autonomous drones

The reality is that these systems can be incredibly costly, and that's before you've started to count the salary costs of multiple shifts of security agents to patrol perimeters, man entry points, and inspect incidents around the clock. All of these costs have to be recouped, and in a very competitive market, data centre operators will be reluctant to spend significant sums knowing they'll have to charge customers more to cover that outlay – giving rivals the opportunity to undercut them.

In recent years, advances in certain areas of technology have made novel solutions to this problem much more viable. One such solution is to replace or supplement some of the traditional security measures with autonomous drones.

The surveillance drones available on the market today are far more advanced than in previous years, and vastly superior to anything you might see on the consumer market. Today, it's possible to purchase "drone-in-a-box" security systems that incorporate autonomous drones and base and charging stations, that can rapidly deploy a drone to an incident site or to

conduct a planned operation at the touch of a button.

These systems can operate 24 hours a day, are as effective in pitch dark as they are in daylight, and relay high quality video feeds directly to the video management systems already in place on site. In doing this, not only do operators save significant sums by reducing the headcount and technology needed to provide optimal security, but significantly enhance the capabilities and efficiency of the overall security operations.

Better still, because they are autonomous, very little training is required to upskill the security agents who will work alongside these systems. The drones also act as an effective visual and aural deterrent to anyone thinking about accessing the site without the required authorisation.

This new security technology is growing in popularity in a number of different sectors and being used to secure everything from nuclear power stations and major ports, to mining operations and large industrial sites. For data centre operators looking to enhance the security of their sites without significant capital expenditure, autonomous surveillance drones present an excellent opportunity.

These "drone-in-a-box" security systems allow data centre businesses to effectively quash customers fears around the security of their data and add a point of differentiation that their competition may not be able to match – whether they charge a premium for the privilege is a business decision for them to make,

but either way, it offers them an opportunity to stand out and address a concern that will only grow with the value of the data we rely on every day.



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RELIABLE POWER DISTRIBUTION?

Evaluating reliability in a track busway power distribution system?

Not all busway solutions are the same; some busway systems work better, last longer, and require less maintenance than others.

BY STARLINE BUSWAY

TRACK BUSWAY SYSTEMS are quickly becoming the solution of choice in data centers, industrial and manufacturing plants, and other facilities with high-level power distribution needs. However, not all busway systems are the same. An effective busway system offers three essential qualities: Reliability, Flexibility and Safety. When evaluating a busway system, you should apply these qualities to four primary elements: track busway sections, joints between sections, plug-in units (or tap-off boxes) and power monitoring systems. Furthermore, you should look for a busway solutions provider with the experience, quality, and service offerings to serve as a reliable business partner for your company.

In this article, we look at the essential quality of reliability, with the objective of helping you to select a top-quality [busway solution](#) that will serve the ongoing power needs of your facility over the long run.

Importance of Reliability

It might be argued that reliability is the most important quality that you should look for in a busway solution.

There are several reasons for this:

First, for many data center owners, meeting the “three 9’s” (99.9%), “four 9’s” (99.99%) or even “five 9’s of uptime” (99.999%) has become not just a goal, but a requirement. Enterprises and hyperscale companies know that any unplanned downtime can cost them tens of thousands of dollars per second in lost revenue.

Wholesale data center and colocation providers build their reputations around Service Level Agreements (SLAs) that guarantee their ability to provide continuous uptime to their customers. The more reliable your power distribution is, the better equipped your data center will be to meet uptime obligations.

Second, the COVID-19 pandemic has forced many companies to rely more on online resources. Enterprise data center owners need to ensure that their IT systems will always be available, so their employees who work from home can continue to be productive. Internet, social media, and online business service providers need to ensure that their services will always be available to remote workers and home users. Colocation providers need to ensure the reliability of their customers' IT infrastructure, so that critical data and applications hosted on IT servers housed in their colocation facilities will always be accessible.

Finally, over the next decade, many companies will deploy, utilize, and benefit from edge data centers. IT deployments on edge networks will often be housed in remote facilities with a small maintenance staff, or in unmanned modular or containerized data centers. With limited or no staff, these facilities will require a reliable power distribution system to ensure uptime of IT infrastructure, as well as efficient power monitoring to notify data center owners of any problems, maintenance issues, or sudden IT breaker shutdowns.

Track Busways

If a [busway system](#) is the “elevated highway” that allows electrical power to travel from the PDU to servers and racks, then individual track busway sections are the “straights and curves” that make up that “highway.” Figure 1 shows the four types of busway sections:

- **Straight Busways (a.)** – The main busway sections that deliver power to the IT infrastructure.
- **Elbow Sections (b.)** – Used to make a horizontal, 90-degree turn in a run, by joining two straight sections.
- **Tee Sections (c.)** – Used to create a 90-degree branch leg, by connecting three different straight sections.
- **Power Feed Units (d.)** – A unit that supplies incoming power from the PDU to the busway. A power feed unit may also include power monitoring equipment, a serial, Ethernet, or Wi-Fi connection for reporting data, and an Infra-Red (IR) window for thermal scanning.

When evaluating a busway system, you should look for several features in the track busway sections that contribute to reliability. Each section should be made of high-grade engineered materials, with a lightweight aluminum housing and either 99% pure copper or copper-contact aluminum hybrid (for higher-power delivery) roll-formed busbars. The bottom should be an open, continuous access slot that runs the length of the busway section, allowing you to use the total available space to insert plug-in units.

The design of the internal busbars also makes a difference. The best design is a U-shaped busbar, which provides a continuous receptacle fitting for two types of connections: (1) a compression-fit joint to

link busway sections together, and (2) a compression-fit electrical connection for the plug-in units in the busbar.

Finally, you should look for a busway solution that offers longer track busway sections, i.e. 3 to 6 meters (10 to 20 feet) in length. Since joints are often the main failure point in traditional busbar systems, having longer busway sections reduces the number of joints. Also, longer busway sections enable you to hang more plug-in units in a single busway section.

Joints

A joint provides a connection between adjacent busway sections, or between a straight busway and an elbow or tee section. Different busway providers use different types of joints. But you should look for vendors that utilize the most reliable kind of joint – a compression-fit joint.

A compression-style joint kit consists of (a) a bus connector – that is, copper blade busbars secured to an insulating mounting plate – and (b) a pair of housing couplers. The joint should be easy to install, but should have elements (i.e. plastic blockers in the housing couplers) that prevent it from being installed incorrectly.

When the joint is assembled (Figure 4), two busway sections are joined together. The bus connector is inserted into the access slot, and connected to the busbars at the joint area between sections. A special installation tool (provided by the vendor) is inserted at the intersection and rotated 90 degrees, to create a “knife blade” compression-fit joint.

The busbar blades on the bus connector provide the electrical connection between busbars in the two adjoining sections. The two housing couplers are then used to connect the aluminum housing of the two sections at the top and bottom of the joint.

(With this kind of joint, the mechanical connection is entirely separate from the electrical connection. Even if the screws that secure the couplers become loose, the electrical connection between busbars will remain intact.)

The compression-fit joint has numerous advantages:

A compression-fit joint is the most reliable type of busway joint available. Failures of this type of joint are virtually unknown. Furthermore, the compression-fit joint is 100% maintenance free. Once it has been installed, no maintenance is required to preserve the joints between busway sections.

When the joint is installed, the “knife blade” compression-fit forms a solid electrical connection between busbars, and also “wipes away” any oxidation that might interfere with electrical conductivity, producing a 100% reliable connection

POWER DISTRIBUTION

every time. (Unlike other busway joints, a compression joint does not require copper grease to improve busbar connectivity or prevent oxidation.)

Plug-In Units

The plug-in units (a.k.a. tap boxes) distribute the branch circuit power load from the busways to the servers, racks, or other equipment. Plug-in units can be easily added or removed to the busway units as needed.

Here are the qualities that you should look for in busway plug-in units. A plug-in unit should have a robust design with minimal moving parts, and the fewest electrical connections possible to deliver power to your critical load. The fewer moving parts the unit has, the more reliable it will be.

(The opposite is true as well. The more moving parts a plug-in unit has, the more prone to failure it is, and the more frequently IR testing (if this option exists) will be required to make sure it is operating properly. For this reason, you should avoid busway solutions that use plug-in units with an overly complex design.)

Also, a plug-in unit should have a simple paddle assembly as its electrical connection. When you insert this paddle into the busway, and turn it, the paddle's terminal stabs form a reliable compression-fit joint connection with the busbars. The plug-in unit should not rely on accessory mechanisms with springs and clips to make its electrical connection.

The problems of bolted and male/ female joints

IN SELECTING a busway system, you should avoid solutions where busway sections utilize bolted joints, which are less reliable than a compression-fit joint. In a bolted joint, bolts are used to press flat busbars together. Over time, the bolts can loosen, again resulting in a poor electrical connection. In a worst-case scenario, the joint can heat up to the burning point and potentially cause a fire in the data center.

Bolted joints must frequently be checked via thermal imaging, and re-torqued in order to maintain busway joint integrity. This adds to maintenance troubles and costs, especially in large data centers where thousands of bolted joints must be continuously serviced.

You should also avoid male and female joint couplings, which are easy to install incorrectly. The two busway sections must be perfectly aligned with each other, and a misaligned coupling can result in a poor electrical connection between sections. Conductive grease is often used between busbars in this type of connection to compensate for poor electrical conductivity, and to make the installation easier.

Due to the unique design of the male/female joint, if the mechanical coupling mechanism fails, the electrical connection will fail as well, since the mechanical and electrical connections are interconnected.

Power Monitoring

Today, many data center owners do power monitoring at the PDU and rack PDU level. But this is not enough. For a more complete package of data, and to ensure the reliability and safety of your entire power distribution system, you should look for a busway solution that allows you to do power monitoring at various points along your busway runs.

Look for a busway system that monitors and tracks both power and temperature data over time. It should have revenue-grade metering to ensure that all readings will be accurate and correct. This type of monitoring allows you to verify that busway runs are working properly, that joints are intact, and that servers and racks are operating at optimum power levels.

[Power monitoring](#) in the busway system can help you to balance your IT loads on each phase when utilizing three-phase distribution from the PDUs to the racks. It ensures that you don't have one phase running at maximum load and two phases running at minimum load.

By monitoring and trending power and temperature data over time, you can identify potential issues before they happen, and schedule predictive maintenance. For example, if the monitoring system identifies a large temperature delta in an end feed unit, it may be time to perform scheduled maintenance and retorquer the cable connections in the unit. Real-time temperature monitoring largely eliminates the need to do IR scanning.

What You Should Look For In A Busway Solutions Provider

In choosing a busway system, you should take a close look at the provider as well. A busway provider should not be just a vendor, but a reliable business partner for your company. You should evaluate the provider using the following criteria: Experience Your busway solutions provider should have years (preferably decades) of experience in busway design and manufacturing. The company should focus entirely on busway systems; it should be their specialty, and not just one of many items in their catalog of electrical products. The provider should be able to demonstrate longevity of product – that is, they should have a record of installing busway systems that are still operational after years of use by their customers.

Also, the provider should have a list of clients from a variety of different industries, such as data center and colocation providers, Fortune 500 companies, government organizations, industrial and manufacturing facilities, banks and investment firms, universities, and hospitals.

Quality Ratings (metrics) A busway provider should have a series of quality ratings. (If the provider can't give you the following ratings for their company, you may want to look elsewhere.)



Six Sigma: The company should be able to provide their Six Sigma quality rating.

Shipments vs. Return Material Authorization (RMA): The provider should have a high number of overall busway shipments vs. an extremely low number of returns due to product failure.

Mean Time Between Failure (MTBF): The busway provider's products should have a long average time between failures. The higher the MTBF, the more reliable the product will be.

Custom-Designed Busway Solutions

A busway provider should offer a range of highly configurable products and services. They should be able to help you identify busway designs that will fit the layout and needs of your specific data center or other facility. For example, they should be able to provide color-coordination of busway products (i.e. all track busways, end feeds, and plug-in units for Busway Run #1 are painted red, while all similar elements for Busway Run #2 are painted blue), which can help to reduce or eliminate downtime due to human error.

Also, a busway provider should be able to engineer and manufacture customized products on demand according to your specialized needs. Engineers should be available worldwide to help design custom plug-in or end feed enclosures and busway systems that meet specific electrical ratings or size requirements. Furthermore, the provider should have a production lead time that fits your schedule, and should be able to complete orders in accordance with your deadlines for data center deployment, installation, commissioning, etc.

Post-Sales Technical and Onsite Support

A busway services company should provide the following:

- A global network of experienced sales representatives who can answer easy questions about their busway products
- A global services team of factory-certified technicians who can help with onsite installation, commissioning, troubleshooting, and routine maintenance.
- A global engineering team ready to support specific projects
- 24/7 availability of technical support

Conclusion

For data center owners, CSEs, and others who are seeking power delivery solutions, the ultimate goal in selecting a busway system should be peace of mind. You want the certainty and confidence that your power distribution system will always be able to deliver the power you need to your servers, racks, or equipment. A reliable busway system is not just a power solution. It provides a competitive advantage, allowing your data center or other facility to stay operational. This ensures that your company will always be productive and able to deliver products or services to your customers.

Calculating Reliability

One method that you can use to statistically evaluate reliability in plug-in units is to compare the number of connections in the power chain. For example, engineers can calculate the difference between two and four electrical connections in a busway, each with the same connection reliability of 99%, through the following method:

$$0.99 \times 0.99 = \text{a } 98.01\% \text{ reliable connection}$$

$$[0.99 \times 0.99] \times [0.99 \times 0.99] = \text{a } 96\% \text{ reliable connection}$$

As you can see, even two additional connections will make a difference in the overall system reliability

DCA Colocation Working Group – An introduction from DCA CEO Steve Hone



AS THE Trade Association to the Data Centre sector the DCA understands that it is imperative that key issues affecting the sector have a point of focus. The DCA SIG's (Special Interest Groups) / Working Group regularly come together over shared interests to discuss issues, resolve problems, and make recommendations.

Outcomes can result in best practice guides, collaboration between group members, participation in research projects and much more. Members find these groups are a great way to ensure their opinions and views are considered in a positive and cooperative environment.

The DCA currently facilitates nine Special Interest or Working Groups. DCA members can join any of the groups and contribute.

The purpose of the DCA Colocation Working Group is to provide a unified voice for the UK Plc data centre colocation and Data Centre Provider community. The Group is chaired by Dan Scarbrough, with Leon O'Neill acting as Deputy Chair.

The Groups Objectives:

Educating international buying community to the operators present in the UK, and the services offered. Increase awareness of the importance of the data centre sector in an ever growing and reliant digital world. Drive the debate for increased inward investment to support the growing and mission critical data centre sector. Promote UK colocation capacity by arranging DC Tours for overseas customers.

Develop closer collaboration between the Telco with Colo sectors in terms of Network and Compute Capacity. Continue to work with fellow Trade Bodies in Europe to ensure the DC sector has a unified voice to policy makers. Coordinate stronger working relationships with external international organisations such as OCP, ONF. Lobby to develop incentives to make the UK the destination of choice for hosting overseas customers digital services.

To request to join this group please contact the DCA - mss@dca-global.org

Conquering the next challenge for colocation providers: Speed

By Ashish Moondra, Senior Product Manager, Power, Electronics & Software at Chatsworth Products (CPI)

AS THE TRANSITION from the Information Age to the Age of Artificial Intelligence gives way to heightened significance of connectivity, cloud service providers and the IT industry work around the clock to ensure the life most of us know today, high-speed internet, mobile connectivity, self-driving cars and machine-to-machine (M2M) learning. A recent Cisco Annual Internet Report confirms this reality.

By 2023, for example, nearly a third of the global population is expected to have Internet access – that is about 5.3 billion users. Meanwhile, the number of IP networks is projected to be more than three times that number. Within the data centre space, the colocation market may see the most growth, with an estimated CAGR of almost 11% from 2020 to 2025. Faster

time to market- in lieu of undertaking an on-premise data centre project that may take months to complete – is the primary reason for the attention toward this segment.

Needless to say, delays in bringing up a new customer within a multitenant environment directly translates into lost revenue. Therefore, it is no surprise that colocation providers are challenged to scale up with solutions that are quick to deploy, manage and service.

The following are two key points for colocation vendors to consider when looking to quickly get new customers up and running.

Vendor Selection

Within colocation environments, end customer requirements generally vary

based on budgets, functionality required and the IT equipment that will be housed within the cabinets. Service-level agreements (SLAs) require colocation facilities to be able to quickly provide the infrastructure equipment that meets the needs of their end customer.

Partnering with equipment vendors that have local manufacturing capabilities and a build-to-order model provides colocation vendors with the ability to quickly procure products aligned with end customer requirements. In-region manufacturers typically have a wide breadth of standard solutions and the ability to create and deliver custom solutions in a short timeframe.

While evaluating equipment vendors for their ability to deliver products in short lead times, it is critical that data

centre professionals ask questions related to location of the supply chain as well as their risk mitigation plans. With the booming demand for more things to be connected to the Internet, some electronic components as well as populated, printed circuit board assemblies can have lead times spanning several months.

Equipment manufacturers in North America that rely on in-region sources for long lead time components will have a better ability to scale quickly to meet demands of larger projects. The common denominator within the data centre white space is the equipment cabinet. Dealing with vendors who can preinstall all infrastructure solutions within the cabinet, including power distribution equipment, cable management solutions, access control and environmental monitoring per the end customer's needs will save colocation vendors significant time, effort, and money.

Additionally, preconfigured solutions that are tested together before they leave the factory minimizes any surprises that could otherwise delay schedules when multivendor equipment is received separately. Finally, consider that preinstalled solutions require minimal packaging, helping reduce waste and the tie required to deal with it.

Product Considerations

To allow remote manageability of the off-premises equipment, colocation vendors provide intelligent hardware solutions that allow monitoring and control of power and environmental parameters within the cabinet. Growing regulatory and security demands also require end customers to control physical access to the cabinet and maintain an audit log of all success attempts.

While these solutions provide significant advantages to the end customer, the challenge is to deploy them speedily over the network and quickly configure them to be fully operational. Intelligent power distribution units (PDUs) that also integrate environmental monitoring and access control provide a unified solution that require just one single network connection. The speed of deployment can be further enhanced by utilizing intelligent power distribution units with Secure Array IP Consolidation that allow up to 48 intelligent PDUs to share one



primary IP address and an alternate one for failover capability.

This setup allows the white space infrastructure for complete rows of cabinets to be managed by one or two ports on a network switch. The alternate and inefficient solution would have been to first install, wire and configure extra network switches purely for infrastructure monitoring, connecting them to every monitored device and then taking a crash cart to each device to perform their IP setup. Once the PDUs are deployed on the network the next step that could take a considerable amount of time is the configuration of every monitored device that includes network access, threshold, and notification settings. In this scenario, choose PDUs with bulk configuration capabilities over the network. However, the preferences of end customers for mass configurations can differ.

For example, while a data centre operations group may prefer bulk configuration through a data centre infrastructure management (DCIM) software solution, network professionals or developers may prefer automated configuration using a Command Line Interface (CLI) or Application Programming Interface (API). This means colocation vendors that deal with multitude of end customers will be ahead of the competition if they

provide a solution that supports most types of bulk configuration methods. All these capabilities not only make initial deployment and configuration easier, but also simplifies ongoing management.

Another important and usually overlooked aspect to consider is the serviceability of the products. The most common maintenance to be performed on Intelligent PDUs is timely firmware upgrades. The products chosen should allow for these upgrades to be easily performed over the network or through USB ports on the equipment. A field-replaceable controller on the unit also allows for seamless serviceability and upgradability.

These upgrades should be capable of being performed while the units continue to provide basic power distribution to connected equipment. Finally, consider that intelligent products such as PDUs should include warranties with an advanced replacement coverage as a norm rather than exception. With data consumption growing faster than ever, speed of deployment and delivery is the most pressing challenge for colocation providers. The ones who consider the two recommendations above will be able to have a competitive edge that will ultimately allow them to grow their top line revenue faster and be ahead in the race.



Ashish Moondra

Ashish Moondra has a total of 20 years of experience developing, managing and selling rack power distribution, uninterruptible power supply (UPS), energy storage and Data Centre Infrastructure Management (DCIM) solutions. Ashish has previously worked with American Power Conversion, Emerson Network Power and Active Power, and has been an expert speaker at various data centre forums.

Colocation, colocation, colocation

By Anna Nicholls Head of Marketing, Teledata



WHEN YOU'RE CHOOSING a colocation provider, you need to think about a lot more than just the location. Sure, location is important. You'll need to be able to

access the data centre fairly regularly, so it's helpful if your provider is commuting distance for your technical engineers - although a decent data centre provider should offer a remote hands service, making location less of a deal breaker - but there are other points to consider when you make the decision on which colocation provider is right for you.

What is colocation?

Colocation (also known as colo) is when you put your equipment - servers, storage, switches, software - into somebody else's data centre. You provide the kit, they provide the space, power, rack and connectivity. That's usually where the provider's involvement ends. Upgrades, monitoring and backups will be handled by you and be the responsibility of your IT team, while the data centre provider concentrates on keeping the lights on, and the buildings secure and connected. Basically, you're renting space in a data centre.

Why colocation?

So why would a business choose colocation? What are the benefits? Well powering and cooling servers is expensive. With colo, you're using the data centre's power, at a much lower cost due to economies of scale. Data centres give you access to a wide range of connectivity options offering both resilience and competitive choice, so ultimately you'll have increased availability compared to an on-premise set up. You still maintain complete control

of your hardware and network, but with a reduced TCO (Total Cost of Ownership) compared to on-premise. So other than location, what else do you need to think about when choosing a colocation data centre?

Access

We've talked about access from a location perspective, but check whether the data centre will be accessible to your engineers at the times they need it. Will they need to make appointments in advance, will access be available out of hours - evenings, overnight and weekends - without an appointment in emergency situations? What about bank holidays? Are there any restrictions on access which might impact your team's ability to maintain your network?

Security

In a world of increasing threats to digital data, this is probably one of the biggest decision points when choosing a colocation provider. Your colo provider will be responsible for keeping your data physically secure, so it's critical that whichever data centre you choose takes appropriate measures to protect itself. Look for a facility that goes above and beyond. From the obvious perimeter fences, access cards and security guards, to the higher levels of security and access control such as mantraps, virtual tripwires, SOC's (Security and Operations Control Centres) and links to police control centres. If compliance is a requirement, check that your data centre provider is ISO accredited.

Connectivity

Connectivity is king, and a data centre is only as good as its connectivity. Some data centres are carrier neutral, which will give you both choice and resilience.

Teledata is carrier neutral, with multiple carriers offering diverse points of entry plus dark fibre availability. We also offer direct connections to major Manchester and London data centres, giving customers a broad range of options and a wide reaching, robust connectivity network.

Resilience

We'll start by talking about power - but resilience covers a wide range of eventualities which need to be considered. It's the data centre provider's job to keep the lights on, so you need to make sure you're happy with their procedures for keeping the facility running in the event of a power outage. Power outages simply cannot happen in a data centre, but they do happen, so what processes are in place to make sure that the cogs keep whirring? Ask about UPS, backup generators, battery storage options and be absolutely certain that you're confident that your colocation provider will not suffer an unexpected power down.

The same goes for other events and disasters - floods, fires, attempted break-ins and anything in between. What has your provider done to pre-empt these situations and therefore, provide contingencies in case the worst happens?

Choosing a colocation provider is a big decision for any business, and if you're going to be tied into lengthy contracts, you need to make sure your decision is a good one. Not all data centres are created equal, but what's important is that the one you choose meets the needs of you and your customers, hits your SLAs and offers the right level of resilience, at the right price.

Choosing a colocation provider is a big decision for any business, and if you're going to be tied into lengthy contracts, you need to make sure your decision is a good one

The DCA Colocation Working Group

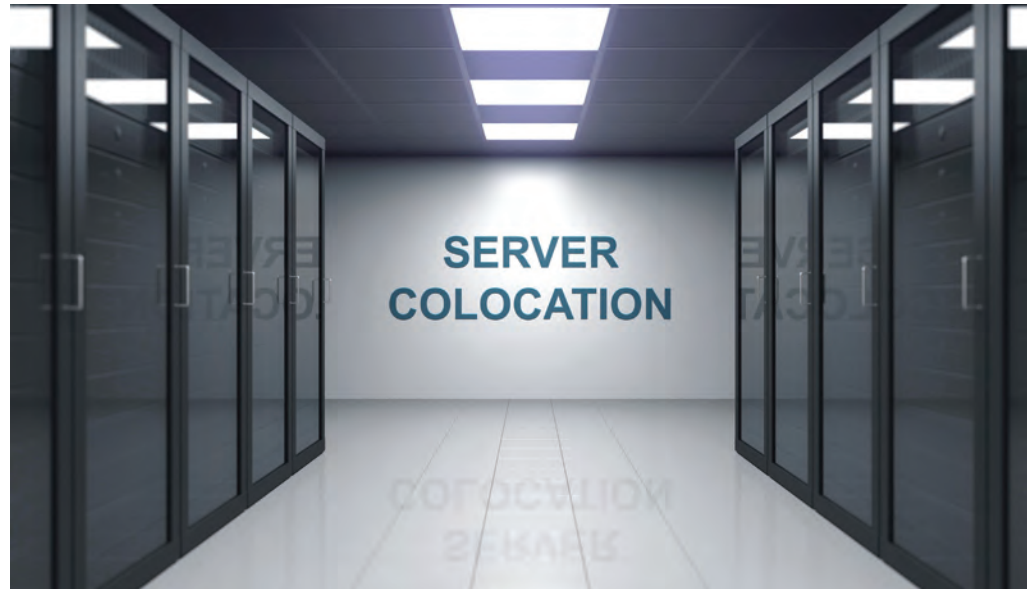
By Leon O'Neill

LEON O'NEILL is the Deputy Chair of the DCA's Colocation Working Group in this article he provides his thoughts on how Covid is affecting the DC Sector and the responses he has seen from the industry. Leon also talks about why the Colocation Working Group was formed and how he hopes it will promote co-operation between UK based operators.

At the start of 2020, who would have thought the world would have changed so much? From a global pandemic forcing businesses into enacting their business continuity plans (or finally implementing one), to accelerated remote working adoption and even global political leaders acknowledging the importance of digital infrastructure, thus promoting our peers to the proud and prestigious position of "key worker". It's been a very tough year for everyone, and I mean everyone. Yet our industry rose to the challenge and proved, beyond a doubt we have the expertise, technology and wherewithal to meet these unique challenges AND had one of the best years for customer acquisition in a long time.

I would say (not out loud, of course), we (The DC industry) have been preparing for some kind of attack for many years, preparing ourselves for some form of legislation, or red tape dreamt up by someone that has very little knowledge of what it is we actually do, has far too much time on their hands and is preparing legislation after watching a YouTube video posted by someone with a user name like "technology-will-kill-us" who hasn't spotted the irony that the poster is utilising technology to get their message out. However, nobody expected that an attack would come from a microscopic, airborne virus. Except Homer Simpson, yeah, seriously, he called it in 1993. – google it.

What we did learn, is we are willing and very able. But now we need to talk about how we sustain our growth, how we maintain profitability whilst adopting/promote new agile technologies that operators can leverage to overcome whatever legislation might come in the



future and achieve that all important target of net zero carbon emissions. After all, those pesky politicians are starting to take notice, realising we are not just digital infrastructure, we are critical infrastructure. It may have taken Zoom calls for them to learn this (which in itself is funny to watch when you realise that the leaders of the world don't know how to use the mute button!) but hey ho, we will take what we can get. Perhaps now the Politicians can put some effort into education programs to attract youth and diversity into our industry, but I promised myself I wouldn't get into that here.....moving on then.

From an activity perspective, we have seen a huge increase in demand for colocation and cloud services, compared to the steady growth of previous years. Akin to dropping an Alka Seltzer into a bottle of coke (definitely google that), the rise in demand has been driven both by the pandemic and hyperscale activity but what excites me and the DCA the most is the activity away from hyperscale/web-scale providers. We have multiple instances of new build and expansion plans with the likes of Ark, NTT, Telehouse and Virtus working to increase capacity/availability contributing to the prediction that London will hit 1.2GW of power usage within the next two years.

And it's not just London: with a significant acquisition in Wales, Hyperscale developments in Manchester, the Midlands experiencing increase absorption rates, Northern Ireland building a brand-new world-class data centre and large investment in the network infrastructure of Scottish data centres. Our industry is on the tip of every investors tongue with M&A activity rampant and investment opportunities growing.

Operators are adopting additional revenue streams above and beyond the real estate conversation such as cloud and financial services. Hardware leasing is increasingly more attractive and an appetite to join the circular economy as OCP hardware becomes more accessible helps the operator to promote themselves as a "one hand to hold SLA". It's very exciting time to be in the data centre game right now.

I regularly speak to UK operators about the challenges they face in their day-to-day operations and as this pandemic continues to invade every aspect of our lives and environments, what strikes me the most is how each operator have adapted so quickly, their willingness to share methods around new ways of working and the support they have provided their staff in that adaptation. It's

that sharing that is at the heart of what the DCA UK Colocation Working Group is all about.

Our purpose is to promote co-operation between UK based operators over competition. So how do you bring the operators together to promote the UK as a leader in digital infrastructure? Firstly, let's give the operators a platform on which to communicate, develop partnerships and share ideas. The DCA UK Colocation Group is purposed for all of the above, but it's only as effective as the participation of its members. So secondly, join in.

It's that simple. This isn't a club or a clique or a hierarchy. It's an opportunity to develop/grow your business, get access to information not often in the public domain and promote your business as part of a shared vision of UK operators on an international stage. We will not only talk about, but act on collaboration, new technologies, financing, staff acquisition, thought leadership, just about anything that your business deems relevant for the group,

with maybe the odd alcoholic beverage or two, or three, go on then, maybe one more.....perhaps one for the road.... and finally a night cap. (when the pubs re-open of course – mustn't defy those social distancing rules now, mustn't we..... Kay Burley?)

And as we move into 2021, we still have many challenges to overcome, including staff shortages, supply chain challenges, attracting youth and diversity into the industry, that 2030 carbon neutral target and lest we forget the now tangible impacts and opportunities of Brexit. And whilst all of those challenges appear daunting, I would argue they represent an opportunity.

So, let's follow the lead of the British people as they clap our brave NHS in an act of support, let our Data Centre Operators unite to promote the UK as a sustainable, profitable and agile location to house international companies' data.

To join the DCA UK Colocation working group for more information contact: mss@dca-global.org



Leon O'Neill
Deputy Chair,
DCA Colocation
Working Group

Leon O'Neill has been involved in the Data Centre, IT and Construction sectors for over 25 years.

He has built a vast network of partners to encourage the industries adoption of agile, sustainable and profitable solutions. Closely aligned with Technology Real Estate Investment Funding partners, Leon aims to bring together their unique skill sets to support the development of the digital infrastructures of the future.

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DCS ONLINE ROUNDTABLE

BASED around a hot industry topic for your company, this 60-minute recorded, moderated zoom roundtable would be a platform for debate and discussion.

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Contact: Jackie.cannon@angelbc.com


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