DIGITALISATION WORLD

Modern enterprise IT - from the edge to the core to the cloud

ISSUE I 2021

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Editor's View

By Phil Alsop

A hybrid future?

THE WORD 'hybrid' is already used extensively in the IT world. Seems as if, whether it's servers, storage, networks, cloud, data centres, security, almost anything(!), a hybrid approach is the best way forward. Maybe we should change our name from 'Digitalisation World' to 'Hybrid IT World'?!

More and more talk of hybrid – I think that's a safe prediction for 2021. As to other possibilities? Well, for as long as the pandemic continues to overshadow every aspect of our lives, trying to understand what the future holds in the workplace is not so easy. At least in terms of what's going to happen when (the idea of 'if' is just not one to dwell on) we return to some degree of normality. We've all had to adapt at various times, in varying ways, and to varying degrees as we've, hopefully, continued to work. Which of these changes will become permanent and which will be gladly ditched (and only referred to in one of those 'do you remember the time when we…' conversations) – that's the unknown.

As has been well documented, digitalisation journeys planned over several years have been accelerated into a few months, so there's a good chance that much of the technology solutions which have blossomed during the pandemic are here to stay, but the major debate seems to be around the extent to which people will, or will not, return to a central, physical office. I'm very much in the flexible, work from anywhere camp, but I'm aware that, for many folk, being in a busy office is almost as essential as breathing. As mentioned at the start of this article, hybrid working is the future, and it will be up to each company and their employees to work out what works best for them.

How this plays out will have a massive impact on many other aspects of life. If busy cities are to empty out, and already slowing high street footfalls continue to decline post-lockdown, then there are some major challenges, and opportunities, to come for organisations everywhere.

And what does the future of business travel, indeed any kind of travel, hold? Back to usual, or even increased levels, or is this a chance to push forward environmental considerations alongside economic 'imperatives'?

Disruption, revolution, call it what you will. These moments in history don't come along that often. And life afterwards rarely returns to 'normal'. But the changes that do arrive – well there's a choice to be proactive or reactive. And the approach your organisation chooses to take will likely define its future success or not.

DIGITALISATION WORLD

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CIOs need greater cross-team collaboration to drive digital transformation

93% say IT's ability to maximize value for the business is hindered by challenges, including IT and business teams working in silos.

Software intelligence company Dynatrace has published the findings of an independent global survey of 700 CIOs, which reveals IT leaders have growing concerns about their ability to keep up with digital transformation. Traditional IT operating models with siloed teams and multiple monitoring and management solutions are proving ineffective at keeping up with cloud-native architectures. As a result, teams waste time manually combining data from disparate solutions in a reactive effort to solve challenges instead of focusing on driving innovation. The report, "How to transform the way teams work to improve collaboration and drive better business outcomes," is available for download here.

The survey reveals:

- 89% of CIOs say digital transformation has already accelerated, and 58% predict it will continue to speed up.
- 93% of CIOs say IT's ability to maximize value for the business is hindered by challenges, including IT and business teams working in silos.
- 74% of CIOs say they are fed up with the need to piece together data from multiple tools to assess the impact of IT investments on the business.
- 40% of CIOs say limited collaboration across BizDevOps teams disrupts IT's ability to respond quickly to sudden changes in business needs.
- 16% of an IT team's time is spent in meetings with the business to identify the causes of and solutions to problems. This issue alone costs organizations an average of $1.7 million annually due to lost productivity.

"As the pace of digital transformation accelerates, and modern, dynamic clouds introduce increasing complexity, the pressure on teams to make data-driven business decisions, and automate operations to deliver business value faster, has never been greater," said Mike Maciag, Chief Marketing Officer at Dynatrace.

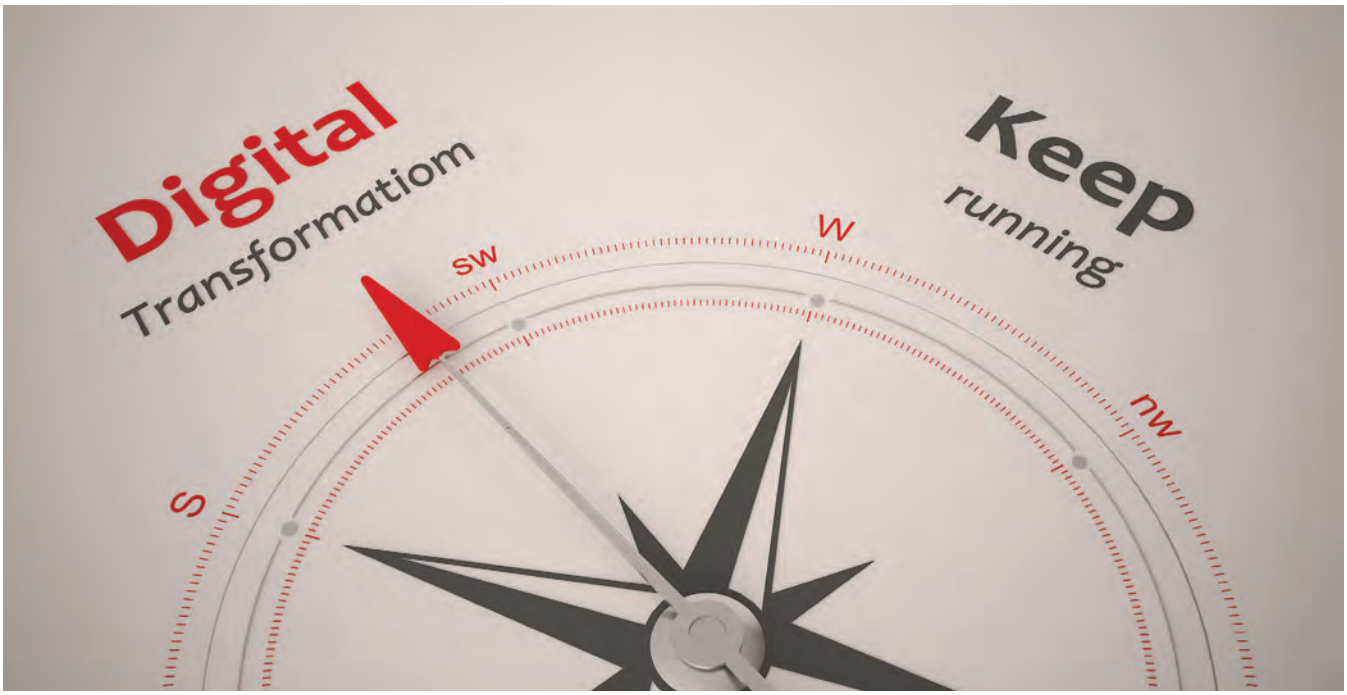
"However, a lack of cross-team collaboration and access to a single source of truth across the organization is hindering BizDevOps teams' ability to achieve this. By using disparate data from multiple monitoring and analytics solutions and adhering to a 'my-part-works-fine' view, they are wasting hundreds of hours and millions of dollars every year, rather than pursuing shared business goals backed by precise, holistic insights."

Additional findings from the report include:

- 49% of CIOs say they have limited data and visibility into users' perspectives on how digital services are performing.
- Only 14% of organizations have a single platform that enables cross-team collaboration and a true understanding of IT's business impact.
- 49% of CIOs say IT and business teams work in silos.
- 40% of CIOs say limited cross-team collaboration makes it more difficult to identify the severity of an issue and minimize its overall business impact.

To ease the burden on IT and avoid stretching limited resources beyond their limits, organizations are adopting new practices that rely on breaking down silos:

- 53% are adopting BizDevOps
- 50% are adopting Autonomous Cloud Operations
- 47% are adopting NoOps



Disjoint between employers and employees when it comes to IT services

THE MAJORITY of technology executives surveyed acknowledge the growing importance of digital employee experience, but less than half measure it the Nexthink Pulse Report finds. Nexthink has released its Pulse Report that reveals the growing importance of digital experience for today's workforce.

Though technology leaders continue to recognize the importance of DEX, the results show a disconnect between the way IT views its services and how employees experience them.

96% of the technology executives surveyed agree that DEX is an essential part of what IT teams do, yet more than a third (34%) rely on manual methods to collect experience information and nearly half (46%) don't measure their employees' digital experience at all.

"Since the start of forced remote work in March, IT has been thrust into unfamiliar territory," said Yassine Zaied, Chief Strategy Officer of Nexthink. "Many IT teams have been asked to deliver flawless remote digital experiences for employees overnight, and while many have made exceptional transitions, others continue to flounder. The delta between success and failure lies in the understanding of the employees' experience – if end-user computing teams don't have insight into what employees are experiencing, they cannot effectively do their job."

In the Nexthink Pulse Report: Exploring IT's digital experience challenges during the pandemic, 70% of tech leaders polled said their ticket and call volume continue to spike, with a majority of those reporting increases up to 50%. The top IT challenges reported by employees overwhelmingly point to VPN connection issues (77%), poor video calls (65%) and Wi-Fi connection (51%). However, this is where IT and employees diverge – a significant number of IT execs feel confident their teams can address those very problems: 63% think they can handle video issues, and nearly half (40%) think they can address VPN performance.

We know from Nexthink's past research that earlier this year a little more than half (56%) of IT leaders felt confident in accurately measuring the impact of new technology rollouts in a remote or work anywhere setup.

The latest Pulse Report shows confidence is low in key components related to transformation experience: digital transformation (only 11% are confident they have insight into experience related to change) and business services deployment (only 6%). Technology leaders now are less confident in their ability to properly deploy new applications and IT services.

Report recommends skills actions

DIGITAL TRANSFORMATION accelerated amid a turbulent year, illuminating the need for an upskilled, future-fit workforce. Skillsoft has released Lean Into Tech: 2020 Tech Skills Trends & 2021 Predictions. As we enter 2021 and beyond, work has irrevocably changed.

Following a year that brought a pandemic and an uncertain global economy, the report offers insight into the rapidly shifting technology landscape, the critical capabilities needed to weather the storm, and the skills needed to put organisations ahead in 2021. Skillsoft's analysis of five million learners provides a deeper understanding of how the confluence of these circumstances will affect the workforce for years to come and signals the rapid changes in technology that organisations must quickly adapt to.

Technology, by nature, is constantly changing; the circumstances of 2020 accelerated that, making it difficult for organisations to keep up. According to a 2020 Brandon Hall Group survey titled, "L&D and the Impact of COVID-19" commissioned by Skillsoft, 45 per cent of organisations are planning to increase tech investment to prepare for the future. Technology skills are in high demand, but supply is low – exacerbating an already widening skills gap.

The report captures the collective technology learning needs of five million learners from the technology and developer industry. Using consumption and search patterns from these users across five areas – Software Craft, Programming, Data, Security, and Cloud – the report highlights resulting trends and recommends corresponding skills to develop. The report predicts 2021's most in-demand tech skills to include:

"Technology leaders are the driving force for business success," said Michael Yoo, customer market leader and GM, technology and developer market, Skillsoft. "As we look forward, the future of work depends on the ability to navigate the rapidly innovating technology space. This report provides faint signals that have bearing on what technologists will want to learn in the future. We've seen learning needs in Software Craft, Infrastructure, and Data lead the globe. There is no better time for an organisation to fully embrace upskilling their workforce to create a future-ready team."

When organisations across the globe went remote, a spotlight moved quickly to the need for online security of information. Cybersecurity intrusions are more frequent and the perils more harmful, and safety relies on people as much as it does technology. Skills such as DevOps and CloudOps Security saw a spike in 2020 – and will be in-demand as the workforce continues to navigate a remote work environment and offices are increasingly virtual.

Meanwhile, Skillsoft discovered learners' intensified need to understand processes and methodologies such as Agile and DevOps which have been consumed more frequently than the programming languages themselves.

60% of organisations claim to have the capabilities for digital transformation success

ALL SECTORS have progressed on their digital transformation capabilities with Covid-19 being the catalyst; retail (73%) and telecom (71%) lead the way.

Close to two thirds of organizations today have the digital (60%) and leadership (62%) capabilities required to successfully implement digital transformation – an increase from 36% on both fronts in just two years. This is according to Digital Mastery 2020: How organizations have progressed in their digital transformations over the past two years – a new report by the Capgemini Research Institute.

To understand how organizations progressed their digital capabilities in the past two years, Capgemini examined average ratings across four categories: talent and organization, operations, business model innovation, and customer experience (CX). Capgemini's 2020 research, in comparison with its 2018 research on digital mastery, found that while all organizations are doing better in their digital transformation journeys in 2020, digital masters – organizations with a high level of mastery across digital and leadership capabilities – are widening the gap with their competitors. COVID-19 has been a powerful accelerant, and, given the urgency for change, organizations have become more enthusiastic and optimistic about the maturity of their capabilities.

Alongside this, organizations have taken time since 2018 to evaluate the challenges that stand in the way of success, increasing their investment in digital transformation and their adoption of emerging technologies and putting a renewed focus on talent and culture. Large organizations, with $10 billion or more in revenue, have been found to have an edge in both digital and leadership capabilities. Some 68% of these organizations say they have the required digital capabilities, compared with 55% of those with less than $10 billion in revenue. When it comes to leadership capabilities the gap is similar: 57% of smaller organizations say they have the required leadership capabilities, marginally lower than the overall average of 62% and the 70% seen among large organizations.

From a sectoral perspective, every industry has progressed in both its digital and leadership capabilities in the past two years. Retail now surpasses all other sectors, with 73% of retail organizations saying they have the digital capabilities required for transformation, up from 37% two years ago. After retail, the telecom sector follows with 71% of organizations saying they have the digital capabilities required. Telecom operators are reshaping the consumer value proposition by creating full-fledged digital experiences. The automotive sector leads in terms of capability growth, having increased its digital capabilities to 69% from 32% in 2018.

Talent and culture initiatives take precedence

Capgemini's 2018 research revealed that the people dimension was a significant barrier to digital transformation, as organizations failed to bring employees along in the transformation journey.

However, more organizations today involve employees in their digital initiatives: 63% in 2020, up from 36% in 2018. Despite this progress, when it comes to skill building, Capgemini found less than half of organizations (48%) are investing in building soft skills such as emotional intelligence, adaptability, and collaboration. Capgemini's research also consistently found that culture is a top barrier to successful digital transformation, with some organizations, for example, not having a culture where new ideas and experimentation are valued.

Accelerating investments in sustainability is critical for digital transformation today The report highlights that while organizations must keep their eye on factors such as customer experience, operations and business technology, they should also place emphasis on sustainability and their broader purpose, which has become important for customers and employees alike.

Consumers are increasingly concerned about environmental footprint and climate change impact and want to make a difference with their actions - 78% of consumers agree that companies have a larger role to play in society beyond their self-interests. Capgemini's latest research found that currently only 45% of organizations are accelerating sustainability investments, projects, and commitment.

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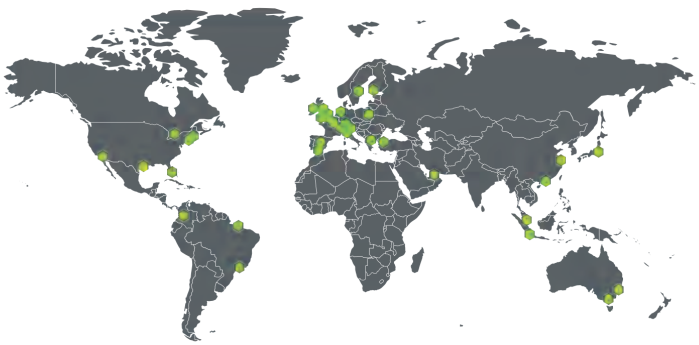

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Optimising data performance

DW talks the benefits of WAN acceleration with David Trossell, CEO and CTO of Bridgeworks.

DW: *Please can you give us some background on the company?*

DT: Bridgeworks' expertise in optimisation of data performance stretches back over 35 years. Bridgeworks industry defining Data Acceleration technology is re-defining Wide Area Networks enabling organisations to reach transfer speeds up to 200x faster, whether large volumes, encrypted or media files. Using Automated, AI technology Bridgeworks dramatically alleviates the effects of latency and packet loss, meaning that data can get to where it needs to be quicker and maximising business performance with dramatic ROI.

Our goal is simple. To ensure your enterprise achieves liberation of your data from wherever it may be, to wherever it needs to be, when it needs to be there. Put another way, there has been a war raging for a long time. The struggle to move data over distance has long been a battle that has been fought. With the data deluge that is upon us, this war is only set to continue unless the issue is flipped on its head and approached in a radically different manner.

Jamie Eykyn is Chairman of Bridgeworks. A serial entrepreneur, he founded Shuttle Technology Limited, which was subsequently sold to SCM Microsystems in 1999. Following the sale of Shuttle, he has concentrated on building a portfolio of transformational technology companies in which he has invested, and of which he is Chairman. Jamie invested in Digital Interfaces Limited in 1999, which later became Bridgeworks in 2002.

David Trossell, the company's CEO and CTO, joined Bridgeworks in 2000, he's a recognised visionary in the storage technology industry and has been a key influencer in developing Bridgeworks intellectual property and leading technology edge. Alongside David's work with Bridgeworks, he has authored or co-authored 18 international patents in his drive and passion toward transformational IT.

DW: *And what have been the major achievements to date?*

DT: We have a record of innovation of going to market, for example, we were one of the first in the market with an ISCSI Bridge. We are shipping our latest 100Gb bridges, and we will continue to push the boundaries in this area. WAN Acceleration will challenge the norm in a radical way. Many people said it would not work, but we've been proved right with the right product in the right market now.

With have done a lot of work with young people, with STEM Awards, and a record of bringing on young graduates and turning them into experts in the field. We are sponsoring a young artist, and she is brilliant. We are very pleased with her; she is doing some great stuff. We have been really pleased that people have voted for us in the series of awards we have won over the last few years – including the SDC Awards.

We won two last year and another SDC Award this year, of which we are really proud.

DW: *Can you give is a broad overview of Bridgeworks' WAN acceleration technology portfolio?*

DT: From WAN Acceleration products we have two versions: one is WANrockIT which is about moving SAN protocols such as Fibre Channel, ISCSI and SAS over vast distances for customers; and one of the unique things is that we can change any protocol to another in flight. We have 4 models in the WAN product range: the 100, 200, 400, 800. This offers WAN capability from 1Gb/s to 40Gb/s.

The second product is PORTrockIT. Rather than dealing with SAN protocols it deals with TCP/IP protocols across the WAN; such as FTP, S3, Commvault, Veritas, Oracle, and RMAN as well as many more. This has the same models: the 100, 200, 400, 800. This offers WAN capability from 1Gb/s to 40Gb/s.

DW: *Specifically, can you explain how it addresses data acceleration?*

DT: The core product is an acceleration engine, takes the data in and parallelises it across multiple virtual connections – in a similar way to Gatling Gun. This is all controlled by AI, which will react to the data flow, latency and packet loss to drive the performance of the WAN up to 95% throughput.

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DW: *Cloud acceleration application acceleration?*

DT: One of the key features of the core acceleration engine is that is it protocol and data agnostic, therefore new see it as just a bunch of 1s and 0s. In that way we can accommodate cloud acceleration, applicationing and in some cases acceleration as we did with Investec Bank in South Africa.

DW: *And storage acceleration?*

DT: This is a little different to IP acceleration. We strip the SAN protocol from the command and data, and that gets fed into the acceleration engine. This gives us the ability to put back the protocol back onto the command and data, which can be the same or different SAN protocol. This can all be done without any overhead.

DW: *And Bridgeworks also offers SAN bridges?*

DT: We have always been at the leading edge of that: the first 10Gb/s, 40Gb/s and now 100Gb/s bridges. SAN Bridges is part of the heritage of the company, and we continue to push the boundaries.

DW: *Partnerships seem to be an important part of the Bridgeworks philosophy – can you talk us through the main ones and the benefits these provide to your customers?*

DT: We have always been fortunate to have had some great OEM relationships with the likes of Alcatel, Bell Telecoms, ICL, Pyramid, Spectra Logic, Quantum, Dell, Emulex, IBM and Inspur. This gives us confidence in our products when we talk to end-user customers, knowing that they are endorsed by very large OEMs.

Q&A - BRIDGEWORKS

We also have connections with universities and the local technical college – doing joint development work with them. For example with Brockenhurst College we sponsored their

STEM Awards, Poole and Bournemouth College for apprenticeships, and Portsmouth University we supported Knowledge Transfer Programmes (KTPs) as part of a joint development.

DW: *How do you see WAN acceleration fitting into the overall digital transformation landscape?*

DT: We have more and more data that is going to be compressed and encrypted, higher bandwidths now at lower pricing and people need to move more data around the globe for production or archiving. WANrockIT is good for people wanting to create DR facilities between offices, and PORTrockIT is great for back-up and archive. The amount of data moving around the world is now unbelievable – including satellite observation files.

DW: *Specifically, does it have a role to play as edge infrastructure is rolled out?*

Y**DT:** es, not in the low latency aspect of edge, but all of the data has got to come to a central point. Getting this data back, even from connected and autonomous vehicles, is going to be a big challenge. At this point WAN Acceleration plays a significant role.

DW: *And, more generally, as the distributed enterprise becomes the 'new normal' – both in terms of the workforce?*

DT: With COVID-19, and everything else that's going on, most people are predicting the demise of the large headquartered office. They are talking about edge offices, smaller offices based in various places so that people can still have some sense of social interaction and of belonging. This is going to be a hybrid workforce with some people working some of the time, or all of the time, from home, and with other people working in an office. This is going to create a lot of data flowing to and from the offices, which is a good target for WAN Acceleration, and that could be the focal point for the connection to the home-worker.

DW: *And the development of hybrid infrastructure – on premise, cloud, managed services and the like?*

DT: WAN Acceleration is perfect for hybrid cloud managed services. The ability to move data at high speed to and from the cloud could not be a better solution. It reduces the effects of latency and packet loss in and out of the cloud, while maintaining WAN and cloud performance.

DW: *We're well and truly in the software-defined era. Does this make any difference as to the role WAN acceleration has to play within the enterprise?*

DT: Yes, we agree. Again, WAN Acceleration can fit into a software-defined or virtualised environment, or into a physical devices. Everything within our solutions are software-defined, and they can run on a number of different platforms such as Microsoft Azure, VMWare eXsi, and IBM. For IBM we only provide the software for their IP replication software, which has enabled us to integrate WAN Acceleration into some of the big OEMs.

DW: *And we can't have a conversation without mentioning the pandemic. How has this impacted Bridgeworks?*

DT: We have been very lucky. Our OEM contracts have kept our revenue streams going for us, and our end-user sales are rising rapidly as people re-organise and realise that there is a need way of working with digital transformation and we have had people working from home, collaborating over various communications packages. We have and will continue to expand our teams.

DW: *And how has it impacted your customers?*

DT: Obviously, everyone is concerned with the cyber-security threats and ransomware. We have enabled customers to move their data far away from their core offices to safe places, providing air-gapped capability to stop the cyber-criminals from getting hold of their data.

DW: *Before we finish, are you able to share any plans in terms of the Bridgeworks roadmap?*

DT: We continue to invest 45% of our turnover into R&D, and we are committed to taking our products to new performance levels, and resilience capabilities with fault tolerance while generally improving the usability and functionality of our products.

Backup – tiers of joy

DW talks to ExaGrid about the importance of ensuring the correct storage backup strategy for your business.

DW: *Please can you give us a bit of background on the company?*

E: ExaGrid designed and architected a next-generation Tiered Backup Storage solution. ExaGrid sits behind over 25 backup application and utilities as the target backup storage for recent and long-term retention backup data. Headquartered in Massachusetts, ExaGrid has grown to 3,000 customers in over 30 countries worldwide.

And what have been the major milestones to date?

- ExaGrid was the first and is still the only to offer Tiered Backup Storage architecture in 2010.
- ExaGrid was the first and is still the only system to be able to ingest a 2 petabyte full backup in 2017, which is the largest in the industry.
- ExaGrid was the first scale-out backup storage to support Oracle RMAN channels in 2018.
- ExaGrid was the first to be able to keep a reconstituted NetBackup Accelerator backup to be ready for fast restores in 2019.
- ExaGrid was the first to bring out a non-network-facing tier for ransomware protection and recovery in 2020.

DW: *And can you give is an overview of ExaGrid's technology portfolio?*

E: ExaGrid offers a series of eight appliances that can be mixed and matched in a single backup storage scale-out system. Each system can scale from a few terabytes up to 2.69 petabytes, and can include up to 32 appliances, allowing companies to pay as they grow.

DW: *You offer nine backup storage appliances, can you give us some idea of how these models differ and what range of applications they are designed to cover?*

E: ExaGrid appliances are various sizes that can be mixed and matched in a single scale-out backup storage system so that the system grows as your data grows. The system can be comprised of any age or any size ExaGrid appliance and support over 25 industry leading backup applications, such as Commvault, Veritas NetBackup, Veeam and many others, as well as backup utilities, such as Oracle RMAN and SQL dumps.

DW: *In more detail, ExaGrid provides backup for both the physical and virtual environments?*

E: ExaGrid is not a backup application. ExaGrid sits behind the backup application as the backup storage and can take any data in that the backup applications backup up such as unstructured files, databases, containers, VMs, Videos, rich media files and any other type of data.

Q&A - EXAGRID

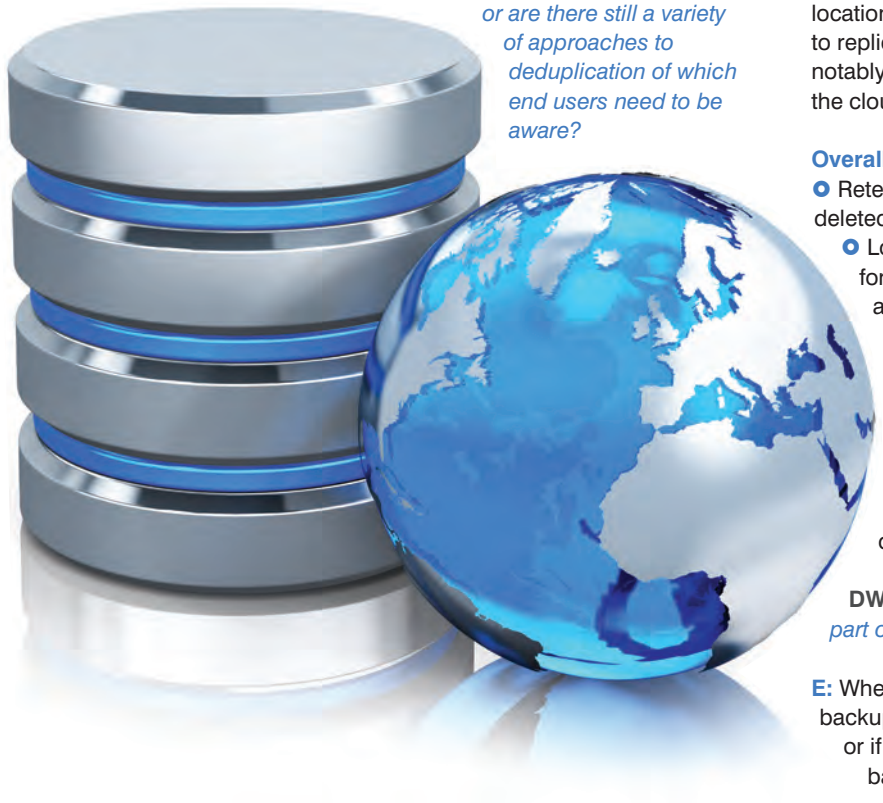
DW: *As well as for private, public and hybrid clouds?*

E: ExaGrid sits at a customer's primary site data centers to store the backup data. ExaGrid can replicate to a disaster recovery site to a second physical ExaGrid as a customer's second data center, colocation facility, outsourced service provider, and can also replicate to an ExaGrid VM in the public cloud for disaster recovery in the cloud.

DW: *Storage tiering as a concept has been around for quite some time. Do you think that end users do now understand the importance of ensuring that the right data and/or applications sit on the right storage appliances, or is more work needed, especially as the IT environment continues to grow in complexity?*

E: We've seen growth in the understanding that the backup storage that sits behind backup applications does impact how efficient and effective the backup and restore performance will be, which is important when determining and organization's RPOs and RTOs. What's unique about ExaGrid is that it is the only tiered backup storage as target storage for backup applications. ExaGrid's approach is the only solution that includes advanced data deduplication for storage efficiency and cost but without impacting backup and restore performance through an integrated front-end disk-cache Landing Zone. So while the concept of storage tiering isn't new, storage tiering in backup storage with data deduplication is unique to the market.

DW: *Similarly, deduplication is a mature technology, but is it very much commoditised or are there still a variety of approaches to deduplication of which end users need to be aware?*



E: Deduplication is a simply a feature that compares one backup to another in order to reduce the amount of storage and resulting cost. However, deduplication ratios can range from a 2:1 up to 20:1, and in some cases up to 50:1, depending on the approach. All deduplication, whether in the backup application or backup storage, is inline which means the deduplication is accomplished on the way to the disk which slow the performance down by 70% and furthermore only allows for the storage of deduplicated data which means for each restore request the data has to be rehydrated since all the data is only stored in a deduplicated format, which slows down restore performance as much as 20X.

ExaGrid is the only solution that built an architecture for deduplication in order to maintain fast as disk backups, fast as disk restores, a fixed-length backup window as data grows due to its scalability, a deduplicated repository for long-term retention data for storage efficiency and cost and also a non-network-facing tier for ransomware recovery.

DW: *Many people now seem to regard storage technology as a sub-set within the wider data protection landscape – do you think this perspective is helpful?*

E: It is important that every organization invest in a solid backup solution as part of their data protection strategy, including backup storage which can often get overlooked. Additionally, every organization should set up a disaster recovery (DR) strategy for business continuity. We recommend replicating data to a backup storage system at a secondary offsite location for this purpose. The cloud is another option to replicate to, but there are some drawbacks, most notably that it takes a long time to restore data from the cloud.

Overall, a backup storage system needs to handle:

- Retention for short-term production restores such deleted files, overwritten files, corrupted files, etc.
- Longer-term retention such as months and years for legal discovery, financial audits, regulatory audits, etc.
- A second site in case the primary site has a site disaster such as a fire, tornado, hurricane, flood, earthquake, tsunami, etc.
- The ability to guard all of the above from ransomware attacks in order to be able to recover if the primary storage is encrypted and the network-facing backup storage is deleted.

DW: *For example, storage backup is an important part of an effective ransomware recovery strategy?*

E: When a ransomware attack hits, it can cause the backup application to issue a delete command, or if someone hacks the storage protocols, all backup storage can be eliminated. ExaGrid is

the only solution with a second, non-network facing tier, 100% controlled by the ExaGrid object code. If a ransomware attack hits, ExaGrid's Landing Zone will be deleted, as would the data in any disk storage or deduplication appliance, however ExaGrid's second tier is non-network facing and has a delayed delete policy that does not process delete requests through from the network-facing tier to the non-network facing tier, so that organizations are still able recover, even if the primary storage is lost.

DW: *ExaGrid recently launched Version 6.0 of its software – can you talk us through the new features?*

E: ExaGrid greatly improved its user interface as well as its reporting features, as ExaGrid continues to move up market to the large enterprise.

In 6.0 ExaGrid also introduced Retention Time-Lock

Feature for Ransomware Recovery in addition to more security features, including:

- New security officer role governs any changes to the Retention Time-Lock policy
- Optional Two-Factor authentication in web-based user interface using any OAUTH-TOTP app
- Additional control over SSH access
- Utilize Active Directory credentials from trusted domains to control share and user interface access
- New operator role for day to day operations reduces the need for administrator access.
- Security checklist for quick and easy implementation of best practices
- Automatic user interface logout after a period of inactivity

DW: *And what can we expect from ExaGrid over the coming year in terms of both technology developments and/or company expansion plans?*

ExaGrid will be continuing to:

- Increase the size of a single scale-out system
- Improve ingest / backup performance for shorter backup windows
- Improve restore and recover performance
- Continue to advance its ransomware recovery solution
- Expand the public cloud disaster recovery solution
- Offer solutions for customers whose applications and data live in a cloud and not on premise

DW: *Before we finish, are you able to share one or two examples of how ExaGrid has helped customers address storage backup challenges?*

E: Our customers have often struggled with the performance first-generation inline scale-up deduplication appliances, such as Dell EMC Data Domain, Veritas Storage appliances and HPE StoreOnce, often experiencing storage capacity issues and restore performance issues. ExaGrid is able to offer restores that are up to twenty times faster, because the most recent backups are stored to the disk-cache Landing Zone in an undeduplicated format, whereas deduplication appliance only store deduplicated data and therefore have to rehydrate the deduplicated data in order to restore it.

In a recent customer success story, our customer compared the experience of using Data Domain and ExaGrid, and how the switch to ExaGrid drastically improved the backup and restore performance.

In addition, one of ExaGrid's strengths is its integration with different backup applications. ExaGrid is very well integrated with Veeam, and it is one of the only backup storage systems that has integrated the Veeam Data Mover which provides a 30% increase in backup performance, and ExaGrid also supports the Veritas OpenStorage Technology (OST), NetBackup AIR and NetBackup Accelerator, in addition to working with Commvault's deduplication, which can be left on or turned off so that customers continue to use Commvault with no change to their current configuration.

ExaGrid further deduplicates the Commvault deduplicated data by up to 3X greatly reducing the storage behind Commvault. Many of our customers find they are able to increase functionality with backup applications, as highlighted in this customer success story, where the customer switched to ExaGrid from StoreOnce and was able to use more of Veeam's features that the StoreOnce didn't support.

ExaGrid provides the flexibility that allows customers to use multiple backup applications or to change backup applications at any time, which is sometimes restricted by other backup storage products.

DW: *And other thoughts or comments?*

E: ExaGrid replaces primary storage disk from Dell, HPE, NTAP, IBM, Cisco, etc. for longer-term retention as ExaGrid is the same or better performance due to its disk-cache Landing Zone but also more than have the price due to its advanced data deduplication in the long-term retention tier.

ExaGrid also replaces first-generation inline, scale-up deduplication appliances such as Dell EMC Data Domain, HPE StoreOnce and Veritas appliances. These solutions are slow for backups, slow for restores, and customers find the backup window grows as data grows due to inline deduplication and a scale-up architecture which also forces forklift upgrades on their customers when they reach capacity.

ExaGrid's scale-out architecture eliminates product obsolescence and costly forklift upgrades as our customers can simply add additional appliances as needed and the backup window stays fixed in length despite data growth.

High availability hosting

with high performance and resilience

DW talks to Jake Madders, Co-Director of Hyve Managed Hosting, about the company's extensive managed hosting and services portfolio.

DW: *Please can you give us some background on the company?*

JM: Hyve was founded in 2001 by myself and Jon Lucas. We both worked in tech for large corporate firms at the time (Microsoft and Goldman Sachs), but we were frustrated by the lack of direct, individualised support within the industry, so we decided to fill that gap.

Nearly 20 years later and we have an amazing team at our Brighton office, an office in the US and provide an

Our dedicated servers are unique because we use special blade architecture, which gives us a much smaller window for recovery. A dedicated server would normally just be a server within a rack, whereas we offer a blade within an enclosure with redundant spares on site

array of fully managed cloud services for customers all over the world!

DW: *And what have been the key milestones to date?*

JM: One of our key milestones was back in 2010, when the cloud boom had just begun. We launched the world's first enterprise cloud product running on VMware, and had household names such as Tesco and LG using it.

Another key milestone was in 2017, when we launched our private cloud offering and expanded to the USA, opening our first global office in California. Last year was our busiest year for global expansion - we deployed production clouds in Tokyo, New York, Madrid, Zurich and Geneva! We're hoping to continue deploying all over the world when the world returns to some sort of "normality".

DW: *And can you provide a high-level view of the company's technology portfolio?*

JM: We provide a multitude of managed cloud services, data centre space and internet infrastructure for a range of clients. We partner with industry-leading technology providers such as HP, Juniper, VMware, Veeam, Cisco, Microsoft and many more.

Our core products are Private Cloud, Enterprise Cloud, Disaster Recovery and Backups, supported by our security suites and all hosted in our secure and compliant global data centres.

DW: *In more detail, can you tell us about the Cloud Hosting offering – enterprise, hybrid, private, public?*

JM: In general, clouds are a standard out-of-the-box build. Hyve builds a bespoke cloud platform for our clients, so it's optimised for their specific needs.

For example, for a data processing company, we would build them a cloud designed for a lot of high-powered compute workload, whereas other companies need better I/O, so we would give them high-end storage disks.

The whole solution is built around what their actual application does and what their bottlenecks are. Most companies just offer cloud and that's the end, but we offer a bespoke cloud, designed specifically for their workload, whether that is enterprise, private or both. And of course, there is our management layer, which you don't normally get.

DW: *And cloud Hosting also covers desktop, backup and DR as-a-services?*

JM: Yes, we can provide those services within a cloud platform (our cloud or a cloud they want us to build for them). Hosting it in the cloud permits more scalability as opposed to dedicated infrastructure, so they can start small and scale as they need to.

DW: *Hyve also offers dedicated servers?*

JM: Yes, but typically they are used to create private cloud platforms. We can provide dedicated tin, but normally our customers want the virtualisation layer within those dedicated servers.

Our dedicated servers are unique because we use special blade architecture, which gives us a much smaller window for recovery. A dedicated server would normally just be a server within a rack, whereas we offer a blade within an enclosure with redundant spares on site.

That's why our hardware replacement SLAs are superior to the competition, due to the infrastructure that we use. To put it in context, when you look at most competitors, a 20 minute SLA will refer to the time from identifying the fault to resolution, or even sometimes just the time to receive a response. With Hyve, our 20 minute SLA refers to the time the system actually goes down to a full resolution, which is unheard of in the industry.

DW: *And the company's managed services include Platform-as-a-Service?*

JM: Yes, we can provide Platform-as-a-Service within our cloud infrastructure. We set up, run and fully manage applications for you, including but not limited to Magento, Hybris, Sitecore, Docker and Kubernetes. Our SFTP hosting is also considered as a Platform-as-a-service, as we set up the file-sharing platform for our customers and host it on our infrastructure.

DW: *Infrastructure-as-a-service?*

Yes, that's basically our dedicated servers. We provide the blades and the storage and then our clients run their applications on the server. IaaS can also be private cloud; some clients want to run their own software, rather than VMware, so we can just give them the blades.

DW: *As well as security?*

JM: We have a huge security suite of products, depending on the customers budget. As standard, all customers get a pair of high-availability firewalls alongside our consultancy and expertise. Optional add-ons include patching, WAF, DDoS protection, IDS, IPS, security audits - the list goes on! We take security very seriously at Hyve and have a long list of accreditations and certifications to adhere to both industry-specific as well as gold-standard security practices.

DW: *And networking?*

JM: We fully manage everything on the network. Everything is high availability, meaning there is no single point of failure anywhere. We peer with multiple tier 1 networks, which gives us the guarantee that if one ISP fails, it won't affect our 100% network uptime. We use multiple companies such as BT, Virgin, CenturyLink, Cogent and Telefonica - so even if Telefonica's whole network blew up, our customers will remain online.

DW: *Hyve is also a colocation provider, with a global network of data centres?*

JM: We offer a much more detailed service than just

colocation space. We have a pre-packaged cloud, whether private or enterprise, which we can deploy anywhere in the world within 30 days. We currently have customers' data housed in the UK, USA, Spain, Colombia, Switzerland and Japan, but we have the ability to move into any other locations at any time, should a customer have a requirement for it.

We are strategic partners with Equinix, the best tier 1 data centre provider in the world, so if you want colocation, it doesn't get much better than that - they tick every box there is. The advantage that we offer is our management layer which you wouldn't normally get with colocation, as well as our ultra-reliable network.

DW: *Moving on to some current industry hot topics, how can Hyve help organisations who are working out their multi-cloud, multi-architecture (on-prem, colo, cloud and managed services) strategy?*

JM: We offer clients an impartial consultancy service and recommend which part of the cloud product suite would be most appropriate for them. We can give clients infrastructure anywhere in the world, based on their bespoke requirements, which most vendors don't do.

For example, AWS offers high I/O VMs, but they are incredibly expensive. As we build each solution from scratch, if a customer has a high I/O requirement, we are able tailor their solution with much better disks, catering for their needs - but at a fraction of the "pre-packaged" price.

The other key offering to a multi-cloud client is our management layer. If a client comes to us for hosting and already hosts some of their data with another provider, we can manage both of their clouds for them.

This means they only have to contact one provider for all support and takes the headache out of managing multiple clouds and providers. We also have tools to integrate the different clouds together.

DW: *More specifically, does Hyve have a role to play as end-users look at 5G and the edge?*

JM: 5G is just mobile network, so not really. With Edge, we could potentially offer some management services in the future, but I honestly think it is more of a marketing term rather than something that is truly going to take off.

DW: *And there seems to be an increasing number of more intensive workloads – HPC, AI etc. – how can Hyve help end users address these requirements?*

JM: We've recently had a big uptick in prospects - mainly from the oil and gas industry - asking for compute resources for HPC which is often related to AI processing.

As we have a global data centre presence and huge footprint, we are able to provision many racks of compute to fulfil their HPC requirements. It's definitely a trend that is on the rise

As we have a global data centre presence and huge footprint, we are able to provision many racks of compute to fulfil their HPC requirements. It's definitely a trend that is on the rise.

DW: *And the pandemic has accelerated digital transformation – a mobile, distributed workforce. What have you seen/do you see as the challenges and opportunities in the 'new normal'?*

JM: We have seen a sharp increase in people asking for Virtual Desktop Infrastructure solutions to support a growing distributed workforce, but the main challenges lie with the internet bandwidth.

Broadband providers are struggling to keep up with the amount of home workers on the network. You can put the kit in your office and then everyone connects to it from their desktops at home. But the problem with that is that you need an amazing outbound office network, so you end up paying so much money for a really highly-connected lease line in your office to facilitate all the remote workers connecting in. Whilst products like VDI are tailored to remote working, nothing is going to beat just using your own PC or laptop and using cloud-based services.

DW: *And are there any other major challenges (or opportunities) on the horizon in terms of how, where and when end-users leverage data centre and IT infrastructure?*

JM: I don't think there will ever be challenges that are too different from what we already see. Our customers need high availability hosting at a good price, with high performance and resilience. That has always been the challenge - finding the balance between cost and suitable infrastructure. I don't see that ever changing, even with the rise in remote working.

I think we'll see a shift to using more cloud-based file repository systems to save live versions of documents, so that end-users can access their data from anywhere without having to pay the price of a full VDI service. That's about setting it up correctly at the beginning - making sure "my documents" is actually saving in the cloud.

Financially speaking

DW talks to Rob Coole, VP, Cloud Technologies, IPC, about the company's success as a technology and service leader, helping companies operating in the financial sector to address the challenges and opportunities of the digital world.

DW: *Can you give us some background on the company?*

RC: IPC is a technology and service leader powering the global financial markets. We help clients anticipate change and solve problems, setting the standard with industry expertise, exceptional service and comprehensive technology. With a customer-first mentality, IPC brings together one of the largest and most diverse global financial ecosystems spanning all asset classes and market participants. As the enabler of this ecosystem, IPC empowers the community to interact, transact and react to market changes and challenges, and we collaborate with our customers to help make them secure, productive, compliant and connected.

IPC brings together a financial community of nearly 7000 that spans the asset classes and types of market participants. As part of the community, our clients are empowered to reliably interact, transact and react to market changes and challenges. Combining industry expertise, exceptional service and comprehensive technology, we help clients anticipate change and solve problems. And, we collaborate to make them secure, productive, compliant and connected.
Our company leverages 50 years of experience in delivering specialised communications solutions

for the financial markets. Today we're even better positioned to align with rapidly transforming markets – and to continue delivering for our customers now and in the future.

DW: *Overview of your main technology portfolio?*

RC: Connexus Cloud

IPC's Connexus Cloud managed Network-as-a-Service (NaaS) for data, voice and enterprise connectivity, financial institutions can trade faster and become more agile than ever before. Connexus Cloud provides adaptive, on-demand connectivity throughout the trade lifecycle across multiple asset classes – equities, fixed income, currencies, commodities, and their derivatives - futures, options, forwards and swaps. More than 2,000 sell-side firms encompassing leading investment banks, brokers, dealers, inter-dealer brokers and prime brokers are part of Connexus Cloud.

IPC has continually invested in making Connexus Cloud not only the best, but the best value trading solution. The Connexus Cloud suite of mission-critical managed solutions includes Connexus Extranet, Connexus Ethernet, Connexus WAN managed virtual private network solution, and a full suite of Trader Voice services including Connexus Voice with advanced SIP functionality. All services are delivered over unified access. Connexus Cloud is protocol-agnostic and supports FIX messages, transaction standards, unicast/multicast market data, all trader voice circuit types as well as other industry protocols. Connexus Cloud is also a Blockchain Optimised Network, and IPC is a member of the R3 Blockchain Community. Other products included in the Connexus Cloud suite include Connexus Chrono, IPC's industry-leading global synchronised Time as a Service (TaaS) solution built with compliance in mind; FX Hub, a low latency, co-located performance solution engineered to address the most complex FX trading challenges; Fixed Income Marketplace, a premier holistic connectivity solution which helps enable market participants to trade fixed income instruments electronically or via voice; Global Exchange Reach, providing exchanges a local presence in a remote region to expand their reach; and Connexus Hub, which facilitates a flexible model for services with global availability at premier colocation facilities.

IPC Blotter + GreenKey

In 2019, IPC invested in Natural Language Processing (NLP) specialist GreenKey Technologies to leverage GreenKey's pioneering, Machine-Learning powered voice recognition technology in order for IPC to build a voice-recognition solution tailor-made for financial traders on IPC's cloud network of ~7000 financial market participants already using IPC's ecosystem to transact via conventional methods. The end result of IPC's investment, the pioneering data visualization tool, Blotter. It is unlike anything else in the trading technology industry, allowing traders to easily access a visible, transcribed stream of transaction threads, breaking new ground in data optimization, customer relationship management and workflow empowerment. This is no small feat, as financial trading is fast-paced, uses unique terminology, and often occurs in noisy environments (e.g. trading floors). Allowing traders the ability to seamlessly flow from chat and instant message to more complex voice trading communications is a completely unique ability.

At a high level, Blotter allows financial market participants to convert their over-the-counter (OTC) voice quotes into a structured data feed. With millions of voice quotes currently being generated daily over IPC's communications platform, Blotter has the capability to unlock this market data.

Blotter greatly facilitates trading in all three areas: execution, analytics and compliance. With regard to the former, Blotter accelerates many front-office workflows, including real-time speech-to-text transcriptions, capture of in-stream orders and quotes, voice populated trade tickets, and call transcription integrations with CRM systems. Blotter enables users to voice populate forms and applications on their desktops through dictation or an in-line telephony bot on trader calls, which greatly increases productivity, as Blotter allows traders to more expeditiously book trades and respond to price requests from customers or colleagues.

For analytics, Blotter digitizes voice trading, enabling better analyzation and automation of workflows by turning voice data into actionable and intelligent insights. Through the voice data it captures, Blotter better illuminates trader-customer interactions by answering questions like: which customers generate the most business? Which customers request prices but don't trade? What percentage of price requests lead to a booked trade? Furthermore, trader voice and chat conversations can be converted into a price data feed to be sold to users' customers for an additional source of revenue.

Regarding compliance, workflows are accelerated by many orders of magnitude thanks to Blotter by allowing users to search through transcribed text archives instead of manually culling and listening to snippets of audio. Teams can also monitor trading communications in near real-time and receive alerts for behaviours and violations through detection of key words and phrases. Blotter can extract each quote and trade from voice communications and pass that through to the compliance database.

A result of IPC's trading communications expertise and cloud financial ecosystem combined with next-generation AI/NLP technologies, Blotter is transforming not only financial trading, but perhaps the entire market.

IPC and Cloud9 collaboration

Q&A - IPC SYSTEMS

In August 2019, IPC Systems and Cloud9 teamed up to create an award-winning advanced, open cloud trading solution for institutional investors. The pioneering, integrated cloud service unites Cloud9's C9 Trader™ voice communications and analytics platform, IPC's Unigy™ trading communications platform and the Connexus™ Cloud financial ecosystem, providing the global trading community with a unified solution for endpoint connectivity, mobility, advanced data analytics and business continuity planning.

For decades, institutional traders have been seeking a cloud solution that addresses their regulatory and compliance needs while streamlining their voice data capture capabilities in an increasingly fast-paced and digital environment. Through this collaboration, Cloud9 and IPC have not only addressed those long-standing customer needs but have also accelerated both companies' abilities to provide cloud-based, mobile, compliant voice communication services to all of the world's financial institutions.

Clients of both firms now have access to the largest worldwide communities of financial markets comprising top-tier buy-side and sell-side firms, inter-dealer brokers, trade life-cycle providers and other key market participants for a state-of-the-art platform of choice. They also benefit from end-to-end, multilingual, live, 24x7x365 global support as well as on-premises services across both traditional and cloud-based deployments.

DW: *And of obvious relevance right now is the company's solution around remote working?*

RC: IPC has a range of highly robust solutions that fully empower traders to work remotely during these challenging times and continue to adhere to strict compliance and regulatory standards. One of the services recently launched in partnership with Cloud9 Technologies and on offer for traders is Disaster-Recovery-as-a-Service (DRaaS). This service is enabling traders to have ubiquitous access to a custom-designed virtual trading desk from any global location during an emergency.

IPC also provides a number of remote devices to allow a firm's traders to extend their best-of-breed IPC physical devices to any remote location via the firm's internal VPN capabilities. Amid the chaos and volatility, the financial markets must carry on fulfilling their

fundamental role in sustaining world trade, commerce and supply chains. The need for people to continue to be paid, buy food and access healthcare has never been more essential across the world.

Such is the importance of financial market participants, that some international governments have classified the financial services as 'essential'. Indeed, it is certainly encouraging to see that market participants and their service providers are coming together in support of one another among the developing challenges.

DW: *We can't talk technology and finance without mentioning blockchain – how do you see it being used at the current time within the finance sector?*

RC: Over the last couple of years, blockchain has slowly come into its own. In 2019, financial markets began to realise the possibilities of what the distributed ledger technology can do and started to identify its use points beyond just powering cryptocurrencies. Blockchain start-ups were on the rise following an increase in new blockchain alliances, such as Enterprise Ethereum Alliance. New infrastructure projects were then introduced, and we began to see the development of real-life deployments and advances.

Advancements with blockchain technology has led to most analysts and commentators predicting a positive outlook in the adoption and adaptation of blockchain in an enterprise context. There has certainly been a rise in companies seizing a competitive edge to redesign and rearchitect blockchain to fulfil the necessary rigorous demands within the financial industry. These companies are now leading the way in showing the sector how the next generation of blockchain can be used intelligently for the new world we now live in.

R3 is a prime example of an enterprise software company that has designed and architected blockchain technologies to address real world problems. It is currently working with over 200 financial institutions, regulators, trade associations, professional services, and technology companies to develop a new blockchain platform called Corda. Corda is specifically designed so that businesses can deliver two interoperable and fully compatible distributions of the platform, addressing issues such as transactional certainty, data privacy, and limitations to scalability.

DW: *Similarly, compliance is a major challenge for the finance sector. How does IPC Systems help its customers address this?*

RC: While many other industries offered the possibility of remote and flexible working – even before the coronavirus made it necessary – the same could not be said for the financial sector. The financial world has significantly more regulatory and security hurdles to jump through which understandably explains why it has been slow to the trend of allowing financial market participants to work from home.

To transition trading activity online exposes the markets to an array of data security risks and scams, which can include phishing, ransomware and skimming. Not only do financial institutions need to worry about overcoming security implications, they also need to address the issue of traders ensuring they are meeting strict compliance and regulatory standards all from within their living rooms instead of official premises.

Since this is likely the first time many financial market participants have worked remotely, these are huge compliance and security issues that financial institutions have needed to overcome. All of IPC's solutions for both on-site and remote trading are designed with compliance in mind so customers can operate knowing they are adhering to strict compliance and regulatory standards.

DW: *And industry collaboration?*

RC: As the ongoing pandemic continues to surround the air with so much uncertainty, one thing most of us can foresee is the need to maintain self-isolating and social distancing until a cure can be discovered and distributed around the world.

This new, restricted way of living and working has caused the FICC markets to plummet and we are seeing great volatility in treasury yields. Despite the heavy variations in pricing, widening spreads and unclear liquidity, it is imperative that financial institutions continue to service clients, discover prices, access liquidity and manage risk as much as possible.

For those firms that highly depend on a small group of venues and counterparties for market access, these extraordinary times pose a great threat. However, this is an opportunity for large networked communities to play their part in creating resilience and distinguishing themselves from their competition.

These large, diverse communities connect traders to an established, diverse and global financial ecosystem which consists of a wide variety of counterparties for price discovery, liquidity and execution. This includes brokers, dealers, exchanges, hedge funds, dark pools, asset managers, institutional investors and market data providers, which, is the information that firms require to find liquidity and access it.

The networks that are secure, resilient and meet compliance standards are able to provide much-needed support to the markets in this time. Companies that were already better prepared for a digitally connected, decentralised world will have an edge and be well positioned to maintain resilience.

A human and open cloud - reversible and interoperable

DW talks to Hiren Parekh, VP Northern Europe at OVHcloud, about the cloud provider's mission to build an ecosystem of companies and organisations, defending the same values of trust and collaboration around data confidentiality and reversibility, for the major, long term benefit of its considerable customer base.

DW: *Please can you give us a brief background on OVHcloud the company?*

HP: We've been trusted by our customers for over 20 years! There have been four distinct phases of growth as we enter phase five in 2021:

- **Phase 1 – Startup (1999 – 2003)**
  - Octave Klaba founded OVH in 1999, while still an engineering student at age 24, with $4,000 USD in his pocket and a head full of dreams
  - He started by building servers to help his friends and colleagues. Soon he started to work with small local businesses and expanding to support other technically minded people with establishing themselves on the web
  - OVH became one of the first companies to receive accreditations for .fr and other domains in Europe
  - Soon, OVH started expanding to web hosting and became a leader in web services
- **Phase 2 - European Expansion (2004 -2016)**
  - Presence in Spain, Poland, Italy, Germany, Portugal, UK. Continued European development in Netherlands, Ireland, Finland, Lithuania, the Czech Republic
- **Phase 3 - Diversification Scaling: (2006 -2012)**
  - Start of our Cloud era with launch of OVH Hosted Private cloud and Public cloud based on OpenStack. Being recognised as a platinum partner by VMware
- **Phase 4 - International Expansion: (2012 – 2019)**
  - Increase capital of 240 million Euros with KKR and Towerbrook; and opened up data centres across Europe and US. Rebranding from OVH to OVHcloud
- **Phase 5 - (2021 – 2024)**
  - Introducing programs to build an ecosystem of

partners, startups and customers. Industry recognition in 2021 in Forrester Wave + IDC MarketScape. Further growth through IPO, M&A, raising capital.

DW: *And what have been the key milestones to date?*

HP: 1999OVH founded by Octave Klaba, one of Europe's first Internet hosting companies
2001 First data centre built in Paris
2002 First servers manufactured
2003 Water-cooling innovation deployed in data centres
2004 First European expansion to Poland and Spain
2005 OVH builds datacentre and establishes HQ in Roubaix, France
2006 OVH deploys its own fibre-optic network
2010 Expansion into the cloud; offering Private Cloud
2011 OVH established as Europe's leading webhosting company and launches Public Cloud offering
2012 North American expansion: office and data centre opened in Canada
2013 Europe's largest data centre built by OVH in Gravelines, France
2016 Investors KKH and Towerbrook invest 250M € in OVH
2017 OVH expands to USA acquiring vCloudAir, opening 2 data centres
2018 Michel Paulin joins OVH as CEO as the company expands to 2200 employees
2019 20th Anniversary, OVH rebrands to OVHcloud serving 1.5M customers worldwide

DW: *And can you give us an overview of the company's technology portfolio?*

HP: Our technology portfolio is categorised into 4 universes:

- **Bare Metal Cloud:** The Bare Metal Cloud universe offers a catalogue of high performance, high scalability products for development, production and backup on the cloud. Requiring just minutes to deploy, OVHcloud bare metal infrastructure is well-suited for e-commerce, web hosting and even application development. Technological building blocks that offer the best price-to-performance ratio, these OVHcloud products will truly benefit IT engineers, small business decision-makers or any individuals passionate about infrastructure, hardware and networks.
- **Public Cloud:** The Public Cloud Universe offers an ecosystem of integrated services, enabling organisations of all sizes - from start-ups to SMEs and enterprises - to develop, deploy and manage their applications in the cloud while keeping control of their data, budget and ability to innovate via open-source technologies.
- **Enterprise:** The Enterprise Universe of offerings helps IT decision-makers secure their hybrid projects for migrating to the cloud by providing a reliable, reversible, predictable and multi-local cloud solution. Enterprise products and solutions offer more agility and innovation to on-premises and existing IT environments, which is what many organisations need. Today, these solutions help companies of all sizes across a number of industries, including the public sector, with their transition to the cloud.
- **Web Cloud:** The Web Cloud universe provides accessible web cloud services to help individuals and companies start and empower their digital journey. With the support of our ecosystem through our partners, we enable businesses, developers and partners to become prosperous in a digital world.

DW: *In more detail, can you talk us through OVHcloud's Bare Metal Cloud offering?*

HP: Within the Managed Bare Metal solutions, Essentials powered by VMware® addresses the needs of organisations looking for improved control by offering them managed and packaged platforms. Small and medium-sized businesses as well as web-hosters will benefit from a fully managed VMware platform based on a 100% dedicated and secure infrastructure, in a predictable and cost-efficient way.

Customers will be empowered by the ready-to-deploy environment, fully operational within a couple of hours, allowing to scale up and down required resources on-demand. The OVHcloud Essentials product is a one-of-a-kind offering for hosting and managing multiple projects and multiple websites within one infrastructure. Customers can also count on VMware features included and OVHcloud network capacity for business availability.

Scale and High-Grade are two new ranges of OVHcloud Bare Metal servers that are optimised for critical and resource-intensive workloads. Being "solution-ready," they also make it easier for large companies to deploy infrastructures, as they are certified or ready for software standards such as Nutanix and NetApp. These servers are designed by OVHcloud experts, in partnership with leading hardware manufacturers and software publishers, to offer the highest performance on the market.

These best-in-class Bare Metal cloud platforms have been developed to support OVHcloud customers as closely as possible to reach their objectives in terms of stability, reliability and flexibility– all while meeting the highest requirement levels, including hardware and network redundancy, and a 99.99% SLA.

These next generation platforms are particularly aimed at Software Defined Storage (SDS), Hyper Converged Infrastructure (HCI), Virtual Desktop Infrastructure (VDI), High Performance Computing (HPC), Artificial Intelligence & Machine Learning (AI & ML), and Cloud Gaming platforms, as they can handle the most

complex, high-precision workloads faster and more efficiently than ever before.

For Enterprise-grade file storage products, OVHcloud will shortly offer Netapp® Cloud Volumes. It will address customer needs for traditional and next generation workloads, no matter which compute they use within the OVHcloud portfolio (Hosted Private Cloud, Public Cloud Instances, PaaS services or Bare Metal servers). Users will be able to effortlessly scale capacity, improve resource utilisation and increase productivity.

DW: *And you also offer a Hosted Private Cloud solution?*

HP: The new OVHcloud Hosted Private Cloud Premier powered by VMware solution offers robust, scalable, and highly automated infrastructure that meets professional requirements for operating critical environments and performing intensive workloads. It also offers a wide range of certifications, addressing the needs of the financial sector, in order to comply with the PCI Security Council standards (PCIDSS), as well as the healthcare sector. This new generation of Hosted Private Cloud leverages the OVHcloud unique high-end platform and is the result of a close collaboration between OVHcloud and its technology partners, such as VMware, Zerto and Veeam. Integrating multiple divisions of hardware and software, Hosted Private Cloud Premier offers a choice of new components, including the latest generation of Intel CPUs as well as enhanced networking capacities.

DW: *As well as Public Cloud?*

HP: OVHcloud provides a sustainable foundation to deliver even more robust and economically accessible on-demand cloud resources. As such, a new catalogue of "compute" instances offering even greater robustness and network capacity will be available. Additionally, a new object storage offer based on OpenIO technology will deliver increased performance, particularly adapted to the use of Artificial Intelligence and Big Data.

By relying on these foundations from OVHcloud, organisations that adopt the "cloud native" approach can take advantage of a managed services platform, allowing them to develop their applications with agility while benefiting from a production-ready environment. Importantly, the geographical availability of the Managed Kubernetes Service is planned for more data centres. And soon the OVHcloud proprietary vRack private network technology will be available to all managed services in the Public Cloud universe, in order to meet the growing need for containerised applications orchestrated by Kubernetes.

For organisations willing to leverage their data, the OVHcloud Public Cloud offer provides a complete catalog of AI and Data Analytics that span across the entire value chain, from data storage to Machine Learning in production. After the launch this summer of Data Processing (to prepare and pre-process data), and ML Serving solution (to deploy machine learning models in production in one-click environments), OVHcloud is launching AI Training which allows data professionals to build and train their models. They now have a comprehensive toolbox to speed up their AI projects and focus on their added value, whilst respecting their budget constraints and having the guarantee that their data will never be used for purposes other than those they have chosen.

In order to streamline the user experience in the Public Cloud universe and enrich its functionality, the integration of a growing number of tools and standard solutions from the OVHcloud ecosystem is underway. This is the case, for example, of the developments in progress for Terraform's support for all managed services in order to respond to "infra-as-code" use cases, or identity federation services to facilitate the application of corporate security policies. Lastly, as more and more organisations are turning to the Public Cloud for its flexibility and the richness of its catalog of services to accelerate innovation, the ISO27001 and international Healthcare Data Hosting certification processes are currently underway to meet compliance needs.

DW: *And Web Cloud?*

HP: This year, OVHcloud has developed its webhosting and domain names offers globally, by making them available in the Asia Pacific and Americas regions, through its Beauharnois data centre Canada). With a diverse set of tools, the OVHcloud web offerings are easy to use and scale for a wide variety of users, ranging from any individual to small companies through to large multi-faceted organisations.

OVHcloud helps support professional websites, blogs,

online retailer sites, web agency work, any project that needs the support of the cloud to launch and scale. Customers in these regions will benefit from OVHcloud's 20+ years of expertise, and the global cloud provider is eager to support its customers' international development initiatives.

The OVHcloud Web Statistics service, which offers customers a simple user interface to quickly visualise the most relevant statistics of their websites, has been entirely renewed. Users can now analyse visits to their website for free and through a sovereign solution developed by OVHcloud, with full GDPR compliance.

OVHcloud has also extended its secondary market domain names catalog. This means that in addition to purchasing original domain names, customers can now buy existing domain names from the current owner. In this way, through OVHcloud as a trusted third party, more than 20 million existing domain names are now made available for its customers. Platform.SH will soon be integrated to the OVHcloud PaaS portfolio to provide a web applications development platform hosted in Europe and GDPR compliant. This end-to-end automated web development platform makes launching and running web applications or websites easy, through a collaborative and agile approach.

Available as an option of the web cloud offer, the Content Delivery Network (CDN) will shortly present a wider range of features to meet companies' performance and security needs on 3 levels: Basic, Security and Advanced. With CDN, customers who need to develop their businesses internationally will have the advantages of faster page-load, improved user experience, secure data, SEO improvement and lower bandwidth costs in each target country.
The SMS offering continues to expand internationally: after its launch in Spain, it's now available in Italy, Ireland, Poland and in the UK for any customer in need of SMS campaigns. They will also be able to follow the results of their campaigns through a new analytics dashboard.

DW: *And you also have what you call 'Enterprise Offerings' – what are these?*

HP: An extensive set of solutions designed to meet the evolving needs of enterprise customers. Many of these have already been mentioned and include Hosted Private Cloud, Public Cloud and managed Kubernetes containerisation solutions. Below are some of our recent announcements.

To support enterprise multi-cloud and hybrid cloud projects, OVHcloud has developed OVHcloud Connect Provider, a solution developed in partnership with Equinix and Megaport (depending on the region). OVHcloud Connect Provider simplifies the implementation of multi-cloud and hybrid architectures by interconnecting the various enterprise cloud environments with OVHcloud data centeres around the world. OVHcloud Connect Direct offers the most secure way to build a decentralised hybrid cloud via direct, private connections between OVHcloud data centres and each client's on-premises informations system. These new solutions provide an opportunity for businesses around the world to combine their existing infrastructure with an open, reversible and interoperable cloud. Clients seeking to interconnect their services with OVHcloud Connect can select the number of private connections and traffic capacity of each individual link (from 200 Mbps to 10 Gbps). Traffic on the OVHcloud network is included in the stated fees, making costs transparent and predictable for each client.

The OVHcloud Web Statistics service, which offers customers a simple user interface to quickly visualise the most relevant statistics of their websites, has been entirely renewed. Users can now analyse visits to their website for free and through a sovereign solution developed by OVHcloud, with full GDPR compliance

Logs Data Platform, a completely managed and scalable log analysis solution offered by OVHcloud is going through three major changes. First, the solution is now available on a pay-as-you-go basis, making billing simpler, more readable and more predictable.

Second, Logs Data Platform has developed internationally and is now available in all countries and languages. Lastly, to comply with customers' stringent security requirements, OVHcloud has created the Enterprise Logs Account on Logs Data Platform – and thanks to this dedicated cluster, customer data is totally isolated. It will also allow OVHcloud to offer new features such as the Network Access Control List, a customisable retention period, or the possibility to manage Logs Data Platform - cluster Load balancer logs.

To meet European public sector and critical infrastructure operator needs towards specific data protection and security, OVHcloud is working on a Trusted Zone offer, aimed at hosting sensitive data. It will assure sovereignty-cautious European organisations an isolated physical zone in a secured perimeter dedicated to the offer, specific custom

security features, and no data transfers outside Europe.

DW: *In terms of recent developments at OVHcloud, can you tell us something about your trusted cloud partnership with Google?*

HP: OVHcloud will introduce a new hosted Private Cloud offering by bringing Google's open source-compatible technology Anthos to its own highly scalable dedicated infrastructure, fully operated and managed in Europe by OVHcloud teams. The Anthos technology is based on Open Source which ensures full reversibility of customer's data and full autonomy for OVHcloud. We are looking to build a long-term partnership and are open to collaborating on other opportunities in the future.

Addressing growing storage and AI needs, OVHcloud enriched its services catalog, by accelerating its storage roadmap with the recent acquisitions of OpenIO and EXTEN technology, and by providing a complete AI toolbox with cutting-edge solutions

DW: *And you recently held your Ecosystem Experience virtual event – how did this go?*

HP: Traditionally we have held the OVHcloud summit as a 1 day event in Paris. We knew the format would be very different this year because of the pandemic. It gave us the opportunity to be very ambitious and really showcase our global ecosystem. Over the course of 3 days we shared around 90 sessions including workshops, keynotes, demos, discussions and customer stories with 60 of our partners, customers and startups from all over the world. It required a lot of effort but was really worth it as the global engagement was nearly 4 times what we normally receive for the physical event.

DW: *And what were the major messages promoted at the event?*

HP: An ecosystem for more sovereignty over data. OVHcloud renewed its commitment towards data sovereignty across the globe. Building on a matrix gathering over 3000 partnering companies, around 4 universes and dedicated programs such as Open Trusted Cloud and OVHcloud Marketplace, the European cloud leader invested massively to strengthen its technological and geographic footprint in 2021. As part of its constant engagement towards European strategic independence, OVHcloud also positions itself at the core of the GAIA-X framework to scale European values across the cloud industry and market worldwide.

An ecosystem to make a data revolution, in a sustainable way.

The company stepped up with an ambitious commitment overtime: reaching carbon neutrality with a pure renewable energy mix by 2025, moreover it plans to achieve net zero emission by 2030. To do so, OVHcloud defines 5 key levers to deliver a strong sustainability agenda: monitoring, design, renewable energy, circular economy and ecosystem mobilisation will be its key focus for the coming months. As part of this roadmap, OVHcloud initiated a partnership with the leading European technology research institute Inria, to enhance monitoring and transform it into a customer facing asset.

An ecosystem to disrupt the data world

Addressing growing storage and AI needs, OVHcloud enriched its services catalog, by accelerating its storage roadmap with the recent acquisitions of OpenIO and EXTEN technology, and by providing a complete AI toolbox with cutting-edge solutions.

Thanks to this, businesses will be able to build their own AI-solution or consume turnkey AI-applications powered by the OVHcloud ecosystem, with fully transparent and predictable pricing. OVHcloud AI Solutions will make selected partners' AI technology tools and vertical solutions available to offer a seamless and unified customer experience. To do so, there will be a full integration of the partners tools and offerings in all the OVHcloud universes and across them. To this end, OVHcloud has selected 30 top European AI experts able to deliver and scale end-to-end solutions.

DW: *The company's OVHcloud Connect offering now includes multi and hybrid cloud support – can you talk us through this, please?*

HP: By partnering with Equinix, the world's digital infrastructure company, and Megaport, a world leader in cloud connectivity services, clients using OVHcloud solutions will now benefit from global coverage. This includes over 700 points of presence (PoPs) for interconnecting their services with their chosen providers. These new solutions provide an opportunity for businesses around the world to combine their existing infrastructure with an open, reversible and interoperable cloud.

Clients seeking to interconnect their services with OVHcloud Connect are able to select the number of private connections and traffic capacity of each individual link (from 200 Mbps to 10 Gbps). Traffic on the OVHcloud network is included in the stated fees,

making costs transparent and predictable for each client.

DW: *And you've also announced a tie-up with ServiceNow?*

HP: ServiceNow are a member of our Open Trusted Cloud program. We are utilising their Customer Service Management offer to improve our customer experience and develop the quality of services available to our cloud customers.
Choosing ServiceNow, the digital workflows leader is in line with an ambitious overhaul of the customer experience at OVHcloud.

Benefiting from a high-performance solution, capable of addressing a wide variety of use cases, but above all scalable internationally while guaranteeing total data sovereignty, the deployment of ServiceNow will be a key asset for customers and their advisors alike. The ServiceNow solution will also allow the OVHcloud teams to increase the points of contact to support its 1.5 million customers more responsively, but also to offer them online kits in order to develop user autonomy.

DW: *And been working with T-Systems in relation to the Gaia-X project?*

HP: OVHcloud and T-Systems made an agreement earlier this year to co-operate following the GAIA-X initiative principles. The partnership will lead to the creation of a trusted public cloud offering for Germany, France and other European markets to address all sectors sensitive to data sovereignty as well as GDPR compliance.

With this partnership, both - OVHcloud and T-Systems - will engage in developing a unique OpenStack public cloud platform. This new offering will address the specific needs of the Public Sector, as well as essential infrastructure operators and companies of all sizes operating in strategic or sensitive areas of public interest. The platform contributes to the European GAIA-X initiative guaranteeing the highest level of openness and transparency, data sovereignty, European data privacy and security.

DW: *OVHcloud acquired OpenIO earlier this year. Can you give us any details of what you've been able to do to date with their object storage solution, and any plans for the future around this?*

HP: Our existing offer was already very strong, we're primarily focused on integrating the talented Open IO team with our storage specialist team and developing the internal engineering for our service infrastructure. We have plans to then launch enhanced services in 2021 to bring the full capability forward. This will include enhancing the S3 APIs and instant scaling. This is just one part of accelerating our full storage strategy.

DW: *We've covered a fair amount of ground looking at OVHcloud-specific technology and news. Before we finish, can you give us a flavour of the major challenges your customers are facing at the present time?*

HP: According to an IDC study in 2017, 'Data Age 2025' it was predicted data will be 10 times the volume of the total pre-2016. 2021 has been a strange year but it does feel like we are in the midst of a data revolution. As growth of data becomes exponential it challenges IT costs and IT governance, so for our customers the challenge is how to use, access and manage it securely, effectively and cost-efficiently. Earlier this year there was the 'Privacy Shield' ruling in the ECOJ which has an impact on the sharing of EU and US data. We have also seen the development of the GAIA-X initiative, of which we are one of the founding members. It's a project for the development of an efficient and competitive, secure and trustworthy data infrastructure for Europe. The challenge for our customers is not only to be aware but also in compliance of these emerging local governance and legislative requirements. It's easy to forget we will be leaving the EU in 2021.

Not only for our customers but for businesses in general the shift towards a remote working model that's really been a product of the pandemic, has led to additional security challenges. There are now greater demands to maintain privacy of data and security. It's also resulted in an acceleration towards Multicloud. In order to meet their new IT needs a lot of customers are having to adapt by working with a range of new cloud service providers.

DW: *And what other challenges do you see on the future roadmap – whether it's new technologies which need to be understood and adopted and/or new aspects of the digital transformation roadmap which will need to be addressed?*

HP: A very recent study by IDC concluded by the end of 2021, based on lessons learned in the pandemic, most enterprises will put a mechanism in place to accelerate their shift to cloud-centric digital infrastructure and application services twice as fast as before the pandemic.

As part of this shift there are a number of areas we see as key to their success, all of which are part of our own roadmap. With the immense growth of data that's predicted, good storage solutions will be vital. We have Object storage solutions based on Open IO acquired technology, Block storage solutions based on EXTEN acquired technology, File storage solutions based on NetApp and Archive solutions based on Tape market standard technology with Atempo all due in 2021 to address these issues.

AI, ML and Big Data will continue to play a big role in 2021. Automation and data management being top of the agenda for many businesses as the shift to cloud centric infrastructure and applications intensifies. We have an integrated AI Solutions platform, powered by leading European partners in the AI space. Building on the open-standard and transparency commitments of OVHcloud and its partners, this AI expert collective will address the needs of private and public organisations to leverage the full business value of their data and scale their AI projects into production. We can expect to see businesses adopting Hybrid and Multicloud solutions to meet the need for greater speed and agility. They will need to cater for always on services, as opposed to in the past where it's mostly been seasonal peak workload management. Our roadmap is driven by our customers' use cases and we have solution ready platforms to deliver high performance and high scalability throughout 2021.

DW: *Any final thoughts or comments?*

HP: In a world where data is at the heart of all aspects of our private, social and professional lives, we want to be the trusted cloud provider who enables each person to create and conduct business freely. We want to offer a human and open cloud, reversible and interoperable. A fair and responsible alternative cloud. We want to put innovation to work for the empowerment of everyone.

We believe that people need access to choices when facing the fragmentation of our digitalised world. We are convinced of the necessity to build an ecosystem of companies and organisations defending the same values of trust and collaboration around data confidentiality and reversibility.

OVHcloud has defined and will continue to evolve the following business programs in order to organise partners, startups and customers around this mission throughout 2021: · Partner Program · Startup Program · Open Trusted Cloud · Marketplace (Currently only in France but will be available globally in 2021).

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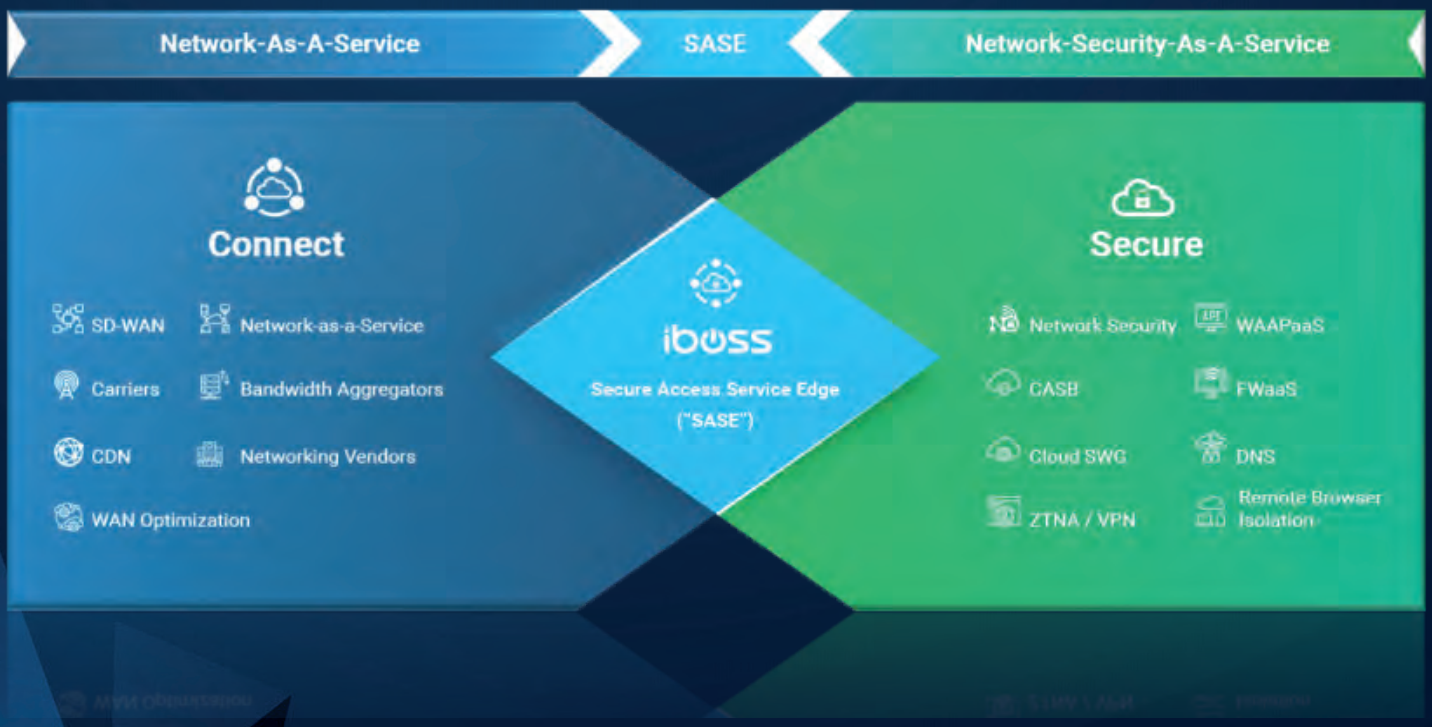

Focusing on the need for fast, reliable data access

DW talks to Wes van den Berg, VP, UK & Ireland, Pure Storage, about the company's pioneering approach to flash storage and how this has helped to raise expectations when it comes to ensuring real-time access to resilient storage.

DW: *Please can you provide some background on Pure Storage?*

WvdB: Pure set out to disrupt the storage industry in our first ten years and we achieved that, we are a pioneer in all-flash solutions. We recently celebrated our 11th anniversary and in our second decade we're fundamentally changing the expectations for data and storage management - providing real-time access to resilient data storage to developers and automating sophisticated data management operations.

DW: *And what have been some of the key milestones to date?*

WvdB: There's a lot we're proud of and customers are at the centre of what we do: our NPS score is 82, which puts us in the top 1% of B2B companies; we've been a leader in the Gartner Magic Quadrant 7 times in a row, most recently positioned in the most top right position in the 2020 Primary Storage Arrays Magic Quadrant. We're growing and taking market share each and every year.

In our first 10 years, Pure completely changed customers' expectations of what they should see from storage arrays and storage vendors. Our focus now is on changing the expectations for hybrid cloud data and storage management. We are growing from a two-product company to offering a full, multi-cloud data services platform – increasing our relevance to both those who build infrastructure: IT, and those that build applications: namely Developers and DevOps.

DW: *And can you give us a high level overview of the company's technology portfolio?*

WvdB: At Pure we give technologists their time back. Our vision is to bring simplicity, reliability and speed to enterprise storage. We focus on delivering a Modern Data Experience by providing solutions that are seamless, flexible, reliable and provide a subscription to innovation. This entails accelerating core applications, activating real-time analytics, enabling hybrid cloud and modernising data protection. Pure's portfolio of solutions lay the foundation for infrastructure to be dynamic and provide a cloud experience via shared services, flexible on-demand consumption and responsiveness to the needs of applications.

DW: *Specifically, can you talk us through the FlashArray product?*

WvdB: Pure's flagship product, FlashArray//X, is the world's first enterprise-class, end-to-end NVMe flash storage array. Built from the ground-up, optimized for all-flash with rich enterprise data services, FlashArray disrupts the industry, bringing 100 percent NVMe to market with 0$ price premium making leading edge innovation mainstream.

In August 2020, Pure announced the second generation of FlashArray//C, the industry's first all-QLC (quad level cell) flash array. This is an important development as it will reduce the cost of running capacity-oriented workloads so significantly (~30%) that it will eliminate the need for legacy hybrid disk arrays. This means that flash storage is now closer to mainstream use for any workload within an organisation's infrastructure which may previously have been relegated to spinning disk or inefficient hybrid solutions.

DW: *And your FlashBlade offering?*

WvdB: FlashBlade helps customers meet workload related challenges: the need for real-time insights, wide performance requirements, analytics and AI needs, throughput hungry applications and increasing ransomware attacks with stringent recovery SLAs. To combat these diverse requirements, Pure Storage created FlashBlade® as the world's first unified fast file and object (UFFO) storage platform to address the most demanding workloads and facilitate customers' digital transformation journeys.

FlashBlade uniquely delivers the multi-dimensional performance and simplicity at scale required for infrastructure consolidation, providing investment protection for organizations at any point in their digital transformation journey. As the first data platform in the industry to offer both native file and object support, FlashBlade allows data architects to utilise the same system for a multitude of analytic applications, providing a single accelerated tier of storage for the most demanding data pipelines.
In addition, FlashBlade acts as an effective defense against ransomware if used as a disaster recovery solution. FlashBlade possesses unparalleled recovery performance of up to 270 TB/hour, with a peak backup speed of 90 TB/hour, which is simply unmatched. It also includes a unique feature in SafeMode Snapshots, able to create immutable, read-only backups, preventing them from being deleted or encrypted even if IT credentials are compromised.

DW: *There's also Pure as a Service, Evergreen and Pure1?*

WvdB: All of Pure's offerings are supported by Evergreen™, it's a unique business model. Evergreen enables storage that is deployed once and non-disruptively upgraded, as needed, without the need to re-buy TBs of storage capacity or controllers customers already own. There's no need for downtime, performance impact, or data migrations. In addition, compatibility for future technologies has been engineered directly into existing arrays. No other vendor is able to do this.

Our Pure as-a-Service offering has been created as a direct result of customer demands for flexible consumption models. A fully flexible, opex consumption model, as opposed to the traditional capex alternative, Pure as-a-Service allows users to move data seamlessly between on-premises or in-cloud and only pay for what they use. A flexible consumption model is one of the biggest benefits of the cloud. It provides businesses with the agility to aggressively drive modernization projects with low risk of rising costs, budget depletion, or vendor lock in. Built on the mantra "simple is smart", Pure1® is a truly AI-powered cloud-based data-storage management and support platform, which manages, automates, orchestrates and optimises data infrastructure across multi-cloud environments. Pure1 enables easy troubleshooting and effortless management, even for large-scale environments. Additionally, Pure1 enables automated infrastructure management, capacity planning, and troubleshooting. This means that organisations can now spend less time managing their IT infrastructure and more time innovating.

DW: *And these products help end users address a range of challenges, including applications?*

WvdB: Customers are looking for more complete solutions for their digital transformation. They are not specifically looking to migrate to subscriptions. They are not specifically moving to SaaS and hyperscalers because it's "the cloud." Customers are moving to services and suppliers that provide the outcomes they desire, rather than just the means for customers to create those outcomes themselves. Pure's solutions continue to evolve to enable customers to automate their data storage and management, and to deliver data management as code to their developers.

In today's world, technology should be available flexibly to better meet the changing needs of organisations worldwide. Fast reliable access to data is essential for modern businesses to make critical decisions and of course, enable digital transformation

DW: *How are these solutions helping data analytics?*

WvdB: Data has never been more crucial for businesses, and data volume growth over the last couple of years has been staggering. With 90 percent of all data in existence today created in the past two years, and 80 percent of data set to be unstructured by 2025 (estimated to be 175 zettabytes in total). Data analytics represents an opportunity to turn this unstructured data into insight; promising the ability to innovate faster and extend competitive advantage.

When it comes to analytics, fast matters. The AI-analytics continuum creates a need to re-use data across applications, driving demand for computing which addresses this need. Additionally throughput-hungry applications in technical computing drive increased performance demands. Flashblade's ability to scale capacity, performance and concurrency allows data architects to utilise the same system for a multitude of analytic applications, providing a single accelerated tier of storage for the most demanding data pipelines.

DW: *How about data protection?*

WvdB: Ransomware attacks pose a significant threat in both the private and public sectors. FlashBlade®, Pure's unified fast file and object solution delivers simple, scalable and performant data protection, enabling organisations to modernise their backup and restore data at high speed and with scale. FlashBlade possesses unparalleled recovery performance of up to 270 TB/hour, with a peak backup speed of 90 TB/hour, which is simply unmatched. FlashBlade also sustains performance, even as data volumes increase. Evidence of this is that competitors share backup and storage efficiency metrics publicly, but never share restore performance. This is because the average competitor cannot restore at over 20 TB/hour, let alone the 270 TB/hour offered by FlashBlade. Consider that a single database restore can easily take 10 hours, with many taking 24 hours, and this puts FlashBlade's speed into context.

DW: *Recently, the company acquired Portworx – can you talk us through the implications of this acquisition?*

WvdB: With Portworx and our existing Pure Service Orchestrator (or PSO), we have expanded our industry-leading data services capabilities to both traditional and cloud-native applications and containers. Our strategy with Portworx is to continue their software-defined storage, container and Kubernetes-control roadmap, and layer in Pure's capabilities with VMs and bare metal workloads; all managed though our unique, SaaS-based, Pure1 management system.

This acquisition also ties into and supports Pure's cloud vision and strategy, which enables customers to make choices based on their business objectives rather than compromises, opting for 'cloud best' rather than 'cloud first'. Pure does this through its hybrid cloud solutions, which unite the best of public and private clouds, allowing customers to simultaneously leverage the private cloud with its enterprise grade performance, and the public cloud, with all the agility, ease of use and dynamism that it offers. By delivering a common set of data services across on-premises and cloud, enabling consistent storage capabilities, APIs, and resiliency, customers can build and run applications anywhere.

DW: *And you've also enhanced your partner program – working with partners is a key part of Pure Storage's success?*

WvdB: Pure is a 100% channel centric company so our approach is very much focused on putting partners first. The most recent enhancements we've made include increased incentives, marketing, support, and training solutions There's a new Partner Portal that provides the latest sales and technical resources, training, personalised marketing campaigns, a digital asset library and social selling content. These enhancements are designed to educate, support, reward and empower partners. In November we also launched a dedicated technical community, Pure Wavemakers. The programme is invitation only and will provide partners with extra resources to help them succeed, accelerate and expand sales while curating a unique technical community they can depend on.

DW: *Any final thoughts or comments?*

WvdB: In today's world, technology should be available flexibly to better meet the changing needs of organisations worldwide. Fast reliable access to data is essential for modern businesses to make critical decisions and of course, enable digital transformation. Driving digital transformation is near and dear to our hearts and we support every customer along their journey. We help customers use their data better, drive more results from it, protect it and enable their people to spend more time on the things that matter.

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WFH? Time your VPN had an SD-WAN upgrade

SD-WAN has come a long way, says cloudDNA Co-founder & CTO, Al Taylor.

BACK IN APRIL, the Office of National Statistics (ONS) published findings stating that 49.2% of adults employed in the UK were working from home and while there will always be sectors that can't 'remote in', those who have WFH have inadvertently contributed to a wide scale experiment with some interesting results.

A survey published by network analysts Global Wireless Solutions in November explained that beyond the obvious user frustrations, including the now familiar "Is it any better if you turn your video off?", half of its respondents actually felt that their competency was being judged when internet connectivity was bad. Furthermore, 62% of those who replied had 'issues' accessing corporate services from home or had been one of 55% who actually admitted to questioning their colleague's capabilities, based on factors that were more often than not completely out of their co-workers control. If that's what your colleagues think, what's the perception of your customers?

A few weeks earlier, the same publication ran a headline stating, 'The average UK home worker is losing 30 minutes of productivity per day due to poor network connectivity.' Sounds unlikely but when you

think about it, 30 mins per day waiting to download or upload files via VPNs, waiting for a screen to catch up in a virtual desktop session, toggling your camera on and off in a "Can you hear me now?" fashion on a Teams or Zoom call and you can see where the time goes. If there are 15 people WFH over a VPN losing 2.5 hours a week each, that's the equivalent of 37.5 hours or the entire salary of one of those team members for an average working week. There's a business case brewing here...

At the heart of the issue is trying to use the internet as a delivery mechanism for home worker services. It's cost effective and, in most cases already in the home which is good. Conversely it's also very unstable due to a wide range of factors out of our control, which is not so good.

When lock down struck, some very fortunate IT sales people found themselves dealing with an influx of customers, desperately trying to find ways to keep the lights on which lead to the industry seeing a huge increase in demand for VPN capacity. The thing is, traditional VPNs aren't really the right tool for the job anymore. Sure, they offer a better security model than doing nothing, but they are fundamentally flawed for a couple of key reasons. The first being that they are reliant on the internet as a delivery mechanism. When the internet is unstable, the user experience drops off and their productivity goes with it. "Can you hear me now?" No, we can't.

There is however another fundamental reason that VPNs are no longer fit for purpose which really boils down to the fact that VPNs were not intended to do the things we need them to do today. Back in 1996 when a Microsoft employee (most sources suggest Gurdeep Singh-Pall) created the peer-to-peer tunnelling protocol which was the precursor to modern VPNs, it was designed to securely connect a device to another device over the internet. And here's the root of the issue, connecting a single device (laptop) to another single device seldom represents the architecture we use in today's service delivery world.

Back then it was pretty straight forward, build a data centre, put everything the user needs to complete their daily tasks in that data centre and only let trusted people in to this Pandora's box, using a VPN to secure the gap between the user and the data centre over the internet delivery mechanism.

In the good old days of public speaking at real events with real people, I used to paraphrase this as all the data in the middle with the users around the outside, but take a look at how we all work today and you'll notice something very obvious. While our traditional data centres are often still in production, many of us also have public cloud infrastructure from the likes of Azure or AWS running in parallel, either to help scale capacity in response to Covid19 or to deliver new line of business services without the need for new physical tin. While this hybrid cloud model clearly doesn't apply to everyone, there are very few organisations that haven't adopted the likes of Google docs, Office365, Zoom, cloud based CRMs, VoIP phone systems or other line of business applications or services. It's a complete paradigm shift from the old model, with the user now in the centre consuming services that originate from many locations around the outside. There are a couple of options available to connect this new cloudy world but they are typically a balance of useability and security and generally far from ideal.

Back haul users to the data centre for internet break out. While this allows corporate web access policies to be enforced, it typically takes so long for the user session to get from their laptop, across the VPN, through the data centre, up to the cloud provider and back again that the round trip time for latency sensitive services (like Teams) leaves user experience a long way short of the expectation.

The problem has had such a negative impact on user experience that it resulted in Microsoft publishing its Network Connectivity Principles in November 2018, with various amendments leading to its current iteration in June 2020. If you've not read it, the key takeaway is use internet breakout at the branch for latency sensitive stuff. Great if you're in a branch office with a firewall but not so great for home workers where deploying a firewall isn't a feasible option.

Split tunnel VPN

Allow access to trusted web services direct from the device and maintain a VPN back to the corporate network sounds great in theory but can be an operational nightmare to manage, particularly with the ephemeral nature of the FQDNs that go on the white list but there's another risk here. You've now got a corporate device connected via a trusted VPN to the corporate network and the internet via the home broadband router. The same router that's connected

to the wireless doorbell, smart thermostat, smart TVs and growing list of IoT devices. Does the corporate home worker access policy include ensuring all IoT devices are patched up to date? Unlikely and practically impossible to enforce.

In either case, we're still reliant on a single internet connection, so secure or otherwise, VPN user productivity is still completely dependent on that one data pipe, even if it is business grade broadband. In a branch office you can justify the cost of a backup link – DSL, FTTC, MPLS or otherwise, with the kit to manage the traffic between them. However, if we want to move beyond keeping the lights on to a credible, enterprise grade long term solution to home working, it really is time to start thinking about life beyond the traditional VPN.

What's needed is a cost effective, small form factor, simple to deploy alternative that provides the same level of security as a VPN when connecting the home user back to the physical data centre. It needs to include a decent firewall so that we can breakout to the internet with corporate policy enforced, avoiding the loop of the data centre and the nightmare of managing split tunnel VPNs for latency sensitive cloud based services.

While we're at it, it needs to hook into external DNS services so that when folks like Microsoft change FQDNs for operational purposes, the user can still reach the service without raising a support ticket and it should also allow the user to directly access virtual desktops or other services that we either consume or publish from public cloud platforms like Azure, AWS or GCP.

It should have the ability not only to bond the home broadband to other transports but have things like built in 4G/LTE support and more importantly, be able to switch between physical and mobile connectivity without the user noticing so the session remains stable, even when the broadband falls over when the schools kick out.

It should allow only trusted devices to access the corporate network and realistically, we don't want cables from the broadband router in the lounge trailing upstairs to the spare bedroom so it needs to provide a secure corporate WiFi service in the home that the kids can't gate-crash. It would also be handy if it had detailed analytics for user productivity and compliancy management.

Choose your vendor wisely and you'll notice that SD-WAN has come a long way from just bonding links to become an enterprise grade branch office in a box solution that provides all of the above and more. From Radiographers to call centre agents and city workers, the early adopters are already gaining productivity with a message that's loud and clear. So long VPN, it was nice knowing you.

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The future of everything is in the cloud, and that includes security

DW talks with iboss about the importance of cloud native network security and secure access service edge (SASE) – essential pillars of any digital cybersecurity solution.

DW: *Please can you give us some background on the company?*

iboss: iboss provides cloud-based SaaS network security for organizations to allow users to connect to cloud applications from anywhere, quickly and securely. Fast and secure connections are the backbone of any cloud transformation as all cloud applications require fast connections. With everyone working remotely and outside of the office, iboss allows direct connections to all cloud applications without sending data back through the office for security. The iboss platform is known as a Secure Access Service Edge, or SASE, because it provides all of the cybersecurity functions needed to ensure users remain secure as they access the resources they need in the cloud, from anywhere.

DW: *And what have been the key milestones to date?*

iboss: iboss has built the largest SASE cybersecurity cloud footprint in the world allowing organizations to provide fast, direct and secure connections to applications for users working from any location. The platform secures over 100B requests a day ensuring users can access cloud resources while preventing phishing, malware and data loss. Additionally, the iboss platform is leveraged by the largest organizations in the world across all verticals to ensure uninterrupted secure access to all business applications while users work from home. This has alleviated the burden on IT staff that have been greatly impacted by COVID19 and have had to protect users that are not bound to the office.

DW: *Please can you give is a high level overview of the company's Cloud Network Security Platform?*

iboss: The iboss platform is considered a Secure Access Service Edge, or SASE, platform. Users connect through the iboss service before accessing any cloud application. This allows the service to inspect the content for compliance, malware defence and data loss prevention. Users experience fast

connections because they do not have to connect through the office via VPN while remaining safe and secure while accessing the cloud resources they need.

DW: *In more detail, it incorporates a Secure Access Service Edge (SASE)?*

iboss: Yes, the concept of SASE ensures that security is sent to the user, through the cloud, instead of sending users to where the security lives which is typically in the office. Legacy network security relies on network security appliances which are hosted in the office which is a challenge because users are no longer in the office. With SASE, users connect through a cloud service which performs all of the security functions in the cloud and eliminates the need to send traffic through the office. This results in fast and secure connections regardless of where the user sits which increases productivity as modern cloud applications require lots of bandwidth. The iboss SASE platform can secure any volume of traffic because it runs in the cloud with infinite resources. This is unlike on-prem security appliances which have limited resources and quickly become saturated with the load from remote workers.

DW: *And addresses the growing interest in Zero Trust?*

iboss: Zero Trust is based on providing access based on who the user is and the role of that user within an organization. Identity is a big factor in determining whether to grant access to a resource or reject it altogether. The iboss cloud platform provides the connection between users and trusted applications based on user identity. Because users connect through the iboss SASE service based on their identity and role, iboss can dynamically grant or deny access to resources in the cloud placing that user on the front door of the application. The iboss platform is a core building block of a Zero Trust strategy.

DW: *And can eliminate the need for security appliances?*

iboss: With the iboss SASE platform, all of the network security function found in proxy security appliances are completely transferred to the cloud service. This is the equivalent of movies moving from DVD players to Netflix. All of the advanced capabilities are available through the cloud service completely eliminating the need for on-prem network security appliances. In addition, because the platform runs in the cloud, it can inspect infinite amounts of traffic ensuring scale without the need to purchase more appliances.

DW: *Provides cloud visibility, along with logging and reporting?*

iboss: Because every connection runs through the iboss SASE service, it is completely inspected and

protected for CASB, compliance, malware defence and data loss. This includes connections to both cloud applications owned by the organization and personal "shadow IT" accounts being accessed from corporate devices. In addition, the iboss cloud platform can decrypt and inspect the full content within those connections, much like opening the luggage through airport security screening looking for weapons and other malicious content.

With this protection, all identified content is reported and logged providing visibility for all cloud access regardless of user location. The iboss platform includes full reporting, including detailed log events and drill down reports showing application access, malware events and data loss prevention.

DW: *Secures mobile users, and provides branch office security?*

iboss: The idea of SASE is that the location of the user is irrelevant. This includes users in the main office, a branch office or working from home. Users are always connected through the iboss cloud service, regardless of location. This ensures that security, policies and visibility are always in place making it easier for network and security admins to perform their functions. It also ensures that users are secure regardless of their location.

DW: *And provides significant malware defence capabilities?*

iboss: Because iboss provides full content inspection of all traffic, this includes preventing malware from Javascript, full page content, files and all other content that is exchanged between users and the cloud.

Inspection and protection includes signatureless protection, including sandboxing, to ensure protection against zero-day attacks. In addition, given the large volume of requests processed in the cloud service, threat intel and malicious activity is analysed and propagated quickly to protect all organizations connected to the service.

DW: *And the iBoss solution is integrated with Microsoft 365 and the Azure platform?*

iboss: iboss is a Trusted Security Partner with Microsoft. The platform is natively integrated with Office 365 and Azure to ensure smooth and efficient interoperability with Microsoft.

In addition, it ensures security policies are shared between iboss and Microsoft, such as Microsoft Cloud App Security. Policies set in Microsoft for data at rest are synchronized to apply that protection in real-time to data in motion. In addition, iboss makes the Office 365 experience better by providing direct connections to Microsoft's front door from users working from anywhere. This is in comparison to legacy approaches that send connections through the office in order to reach Microsoft which introduces high latency and a poor end-user experience.

DW: *Can you explain what the iBoss partnership with FireEye provides?*

iboss: The iboss-FireEye partnership provides SaaS-delivered FireEye in the cloud. This is 100% of the same capabilities found in the on-prem FireEye NX, but without appliances and allows protection for users regardless of location. It layers world-class FireEye protection on top of world-class iboss protection to deliver greater efficacy and security for users wherever they roam.

DW: *And the company has formed a distribution alliance with Ingram Micro?*

iboss: Yes, the largest distributors are offering iboss as the need for cloud-based, SaaS-delivered network security is higher than ever before. Connectivity is the pillar of all cloud strategies. The iboss platform can quickly deliver all of the connectivity and security functions without the burden of deploying network infrastructure.

DW: *What other plans are there to grow the iBoss footprint?*

iboss: All regions across the world depending on the fast and secure connections provided by the iboss SASE platform. We've formed partnerships with organizations such as Softbank who distribute the platform throughout Japan. The global sales force is expanding to ensure every organization has access to the iboss platform throughout EMEIA, APJ, Africa, and the Americas.

DW: *And can we expect some technology additions to the Cloud Network Security Platform in the next few months?*

iboss: Given the iboss SASE platform is a platform, there are so many capabilities that can be added centred around security and connectivity. The platform will continue to expand around CASB, ZTNA private access, malware defence engines and feeds and role-based Zero Trust capabilities.

DW: *More generally, how do you see the cybersecurity market developing over time – will what we might call the legacy vendors struggle to remain relevant when compared to the cloud native security solutions providers?*

iboss: Eventually, the need for organizations to buy firewalls or proxy appliances will go away. The notion of "working in an office" will be irrelevant. What is the difference of a user connected within an office building or connected from their home. In both cases, the connection should not be trusted. For example, the user in the office may be connected to the neighbour's wi-fi without knowing it. With cloud native network security, users can work and connect from anywhere with security and visibility in place at all times. Devices will connect directly to the cloud applications they need, without having to send their connections through unnecessary hops that cause latency. The future of everything is in the cloud, including network security.

The best security is always a layered defence approach. However, I see consolidation of capabilities into a single platform for each category. For example, there might be a single security platform for anything related to connectivity or a single security platform for anything related to data at rest (endpoint security)

DW: *And can you foresee a time when end users are able to acquire a single, end to end security solution, as opposed to having to acquire several pieces of software to provide comprehensive security?*

iboss: The best security is always a layered defence approach. However, I see consolidation of capabilities into a single platform for each category. For example, there might be a single security platform for anything related to connectivity or a single security platform for anything related to data at rest (endpoint security). All of these capabilities will work together through a centralized cloud platform such as iboss.

DW: *Any other thoughts or comments?*

iboss: The future of everything is in the cloud, including network security. Bandwidth and encrypted traffic will continue to exponentially increase. They have to in order to ensure users are the most productive possible while their connections are encrypted and secure while they work from any location. The only way to ensure fast and secure connections at scale is with a SASE platform like iboss. As a network or security admin, you should not worry or lose sleep that bandwidth is going up or encrypted traffic is making it difficult to get the security and visibility needed.

Bandwidth and encrypted traffic should go up, which will ultimately reduce calls to the help desk about slow connections. Instead shift the focus of solving that problem with the right solution. Cloud problems need cloud solutions, and iboss as the leading SASE platform can solve the challenge of providing fast and secure connections to all users regardless of their location and regardless of what they are connecting to.

Don't stop at tech investment when building a data strategy

There is growing recognition amongst business leaders for the potential of data to accelerate growth and improve productivity. In turn, we've seen a growing investment in business intelligence tools that help them get the best out of their data.

BY FRANK KOZUREK, DIRECTOR AT MOTION BI

THE REWARDS are plentiful for those that do so effectively. Indeed, research from Wharton School, commissioned by Qlik, previously identified that data-driven companies are associated with a 3-5% increase in enterprise value.

However, there are a number of common challenges that prevent companies from achieving the maximum ROI from these investments. In many cases, these are underpinned by a lack of foresight in developing a data strategy that responds to the immediate needs of the business, without reflecting on its potential use in the future.

But how can business leaders look ahead and build a strategy that doesn't just serve today's use cases, but will enable the organisation to benefit from the investment into the future?

Avoid short term thinking

Business leaders ultimately don't want to invest in a one-trick-pony, but a capability that will enable them to achieve their broader business ambitions. From the outset, it is important to reflect on the bigger picture: how can data and analytics improve productivity and innovation? How can data help us achieve our business goals?

Thinking about these questions will be critical to developing a strategy that will help companies best use their data to support their business objectives and see a greater ROI. This will, in turn, allow them to identify the best tools to support the organisation's goals and outline a roadmap for how they can be successfully rolled out. This is the first crucial step toward becoming a data led business.

Putting data at the heart of decisions

With a strategy in place, the goal should be to make data part of a business's everyday decision-making process. Data technologies alone will not solve business problems, they are enablers that will deliver business value, if and only if, they are used correctly in the context of the business and its people. It's important to consider what roles, responsibilities and interactions are required for the workforce to effectively leverage insights, and to ensure that these insights correctly evolve over time in line with the changing demands of the business.

The quicker and more confident a business is with data insights, the greater ROI they will generate from their data tools. In order to get to a point where every employee uses insights to inform their business decisions, it's important to ensure that data is accessible, relevant and easy to consume.

Data platforms have the capability to convert data from raw, to ready for analytics consumption, breaking down information barriers and reducing the complexities inherent in legacy data environments. This means employees can spend less time preparing data for use and more time discovering insights.

An award-winning example of this at University Hospitals of Morecambe Bay NHS Foundation Trust (UHMBT), where the hospital has created a cutting-edge Analytic Command Centre, used to inform decisions by frontline healthcare staff. Leveraging the Qlik Sense analytics platform, the Command Centre is a physical analytics hub in the hospital, where five large touchscreen displays along the wall present different aspects of the emergency care journey.

The screens offer insights into the ambulances on their way to the hospital and developments in the Emergency Department, which help staff prepare for the arrival of patients by assessing their needs and hospital resources. It has had a significant impact on the management of the Emergency Department – the

number of patients triaged within 15 minutes has grown by 30 per cent. Following the success of the data strategy at UHMBT, seven trusts in London have also now adopted the command centre model to help with the flow of patients and ensure that data is a natural part of decision making.

Commit to boosting employee skills

To get the most out of data technologies, you have to put people at the heart of your strategy. Employees must be confident in reading, understanding, questioning and making decisions using data. However, just 17 per cent of the UK population are data literate, according to a recent report from Qlik and Accenture on The Human Impact of Data Literacy, with 46 per cent of employees frequently deferring to making decisions based on gut feeling over data-driven insight.

Organisations must recognise that investing in data literacy skills is critical to improving their ROI on data tools. Furthermore, data literacy training needn't be a costly endeavour: the Data Literacy Project offers a number of free resources and e-learning courses organisations can use to help their workforce understand the value data and develop their skillset.

Embrace the potential of data

If an organisation arms itself with an effective data strategy and gives its employees the opportunity to utilise the data on offer to them, a new layer of insight will quickly be added to the business. While investing in the right technology is a necessary step in becoming data-led, longer term success cannot be achieved without implementing a more forward-thinking strategy.

Transformation requires a cultural change

For organisations to undergo successful digital transformation, a change in cultural mindset among leadership is crucial.

BY CARSTEN RUST, DIGITAL TRANSFORMATION DIRECTOR EMEA, PEGASYSTEMS

It could be argued that there are not just four fundamental forces in physics; there is another universal 'force': resistance. The writer Steven Pressfield once described the effects of resistance as leaving things as they are in order to prevent any action, creativity, and progress. Indeed, in many companies digital transformation projects, resistance can create significant barriers to progress. However, since the start of the pandemic, most companies have recognised the urgent need to digitally transform to adapt to rapidly changing circumstances. C-level executives have commissioned taskforces, think tanks and innovation labs to address the digital challenges they face.

Some teams hope to achieve a quick-fix solution by recruiting external transformation consultants, but this may only be a temporary solution and unnecessarily lengthen the overall process. Furthermore, according to Professor Alf Rehn and Stanford Professor Steve Blank, this approach is driving the rise of 'innovation fatigue' among employees, the idea that people are tiring of new innovations that don't last, demotivating them.

On many occasions, experts have proposed that leadership is the key ingredient to unlocking success in digitisation, but somehow the topic has been slow to show within the boardroom. This brings to light

questions such as whether or not companies are setting themselves up for failure, or if they are feigning actionism for appearance. Another possibility is that carrying out digital transformation is seen as too risky or complex.

On its own, quality of leadership is simply not enough to realise successful digital transformation. This is especially true if organisations have been built solely upon the foundation of classic management practices and a business-as-usual mindset.

The unique thing about digitisation is that it requires a whole new perspective, as by definition, digital transformation revolutionises organisations. In other words, it requires a complete change to organisational culture from the top down.

Shift in behaviours can range from challenging pre-existing business models and welcoming critique from peers, to concentrating on being empathetic and doing the right thing for customers to ensure they are in a good place in the future, even if it impacts profits in the short term.

Business leaders need to not only embrace change but also anticipate it. Many workers could have doubts about innovation and would prefer to leave things as they are, but without creativity and adaptation, organisations will likely lose out to competitors who are shaking up their own enterprises. Therefore leadership teams need to prepare ways they will 'sell' forthcoming changes to employees to get their cooperation and limit push back.

Ultimately, leaders have no choice but to tackle resistance head on in spite of all the heavy arguments held against disrupting the status-quo. There may be completely fair concerns from employees, but it is the company's job to foresee issues and explain how problems will be solved so change can go ahead. The world is already vastly different now to the one at the start of the 2020, and leaders have no choice but to adapt by disposing of outdated mindsets and by replacing them with a new outlook.

This type of leadership, one that is always prepared for change, can be likened to that of 'artisan leadership', a theory proposed by Michelangelo. The idea is that similar to an artisan, executives carve and shape the culture of innovation with the same precision as they would a high-quality piece of art – with impeccable attention to detail. It brings to focus the importance of creativity and its role at the heart of a company's processes.

Overall, in order to implement digital transformation successfully, and put to rest any employee fears or doubts about change within the company, cultural transformation on an executive level is imperative. Only when cultural change has been affected, can real innovation be realised

Connecting the new digital reality of the business world

A global, seamless connectivity ecosystem is required to spur IoT adoption by businesses worldwide to deliver on the potential that this technology holds to transform the way we do business. We need to build a connected world rather than just a digital one.

BY BEN BANNISTER, DIRECTOR - MOBILITY & IOT, TATA COMMUNICATIONS

IT DOESN'T MATTER if you are a carmaker in Europe, a pharmaceutical company in the US or a consumer goods manufacturer in Asia, your business and operations will have been impacted by Covid-19. You might have pivoted toward online commerce, introduced further digital transformation into your supply chain, or simply integrated the virtual collaboration tools your teams needed to work remotely. For many organisations the future of business is a digital one. The problem is that we are not all connected – yet!

As the pandemic accelerates the adoption of digital transformation and increases not just the number

but also the variety of connected devices, existing connectivity models have become outdated.

Businesses need easy access to a globally available mobile network to provide the flexibility and autonomy needed to manage the projects necessitated by Covid-19. How can a business be expected to bring together multiple, fast-moving digital transformation projects without seamless connectivity?

Despite the recent surge in projects, we are still at the early stages of a truly connected digital business landscape. The global pandemic has pushed data usage growth at an increased rate, and currently, most mobile network operators are focusing on ensuring their networks can keep pace. The promise of a global virtual network approach, which aggregates connectivity across multiple physical networks, to offer seamless, reliable and secure access to connectivity is one that many businesses need.

Global Connections

With a shift to digital-first business models, and the need to hone and streamline business processes, fulfilling the potential of the Internet of Things (IoT) is now a key element in digital transformation programs for many. IoT promises to deliver increased transparency and actionable data into their businesses operations and processes which was previously unattainable.

Now more than ever IoT can bring about massive change in organisational control and operations. Let us consider one of the sectors most affected by Covid-19; the freight industry. Right now, when you give your consignment to a freight carrier you might be able to track it online or receive status updates from time to time, along with an approximate delivery window. However, with a globally connected network, various sensors relaying track and trace information will be able to tell you exactly where the consignment is on its journey.

This approach applies across multiple use cases, including employee tracking and fleet tracking management. Businesses in the supply chain sector (including freight forwarders, shipping companies and logistics providers) can make sure their drivers are always in contact with HQ, leveraging analytics software to track and analyse key performance aspects of their employees and fleets anywhere in the world, at any time. Leveraging data in this way can be an effective strategy for business optimisation but only if an enterprises network is truly connected.
The issue is that mobile networks are licensed and defined on a country by country basis, not at a global level.

Why is this important? Traditionally, mobile network operators (MNOs) have been in control of their networks in terms of network architecture, deployment, capacity and investment. Until recently, MNOs have been responsible for all the devices connected to their own network.

This is sustainable if the only connected devices are mobile phones, laptops, and mobile tablet devices – but global supply chain management requires seamless connectivity on a global basis for a much wider set of devices. The existing mobile device connectivity model simply won't work in this borderless connectivity scenario. Mobile networks offering seamless services on a global basis are needed.

The Potential of IoT

The global automotive industry provides one of the most compelling, yet challenging case studies associated with the potential for a global mobile network.

Connected cars enhance the driver and passenger experience, as well as creating new service (and revenue) opportunities, by connecting to other parts of the infrastructure – referred to a V2X. Manufacturers, insurance companies, and telematics providers all recognise the potential benefits when a car can optimise aspects of its operation and maintenance, as well as providing next-generation infotainment services, additional safety and security. This all adds utility and value to the vehicle owner or operator.

The lack of a truly global connected playing field means that these complex connected car solutions are still in their infancy. The main challenge for the automotive manufacturer is in developing use cases that best suits the needs of their customers and successfully implementing them with the highest efficiency and lowest degree of complexity. This has to be done on a country by country basis, which is not at all convenient or efficient.

A global connectivity platform, ensuring that communications connectivity that is available for 'connected' devices on a multi-country basis presents a significant advance on existing conventions.

A Global Ecosystem

We have seen a massive acceleration in adoption rates across the scope and number of connected devices and digital solutions as a result of Covid-19. To reach their full potential in many segments, IoT enabled devices require borderless, secure, and scalable connectivity to ensure the capture, movement, and management of information worldwide. Whilst cellular connectivity has provided a strong and effective foundation for IoT services, today's mobile networks are inherently local.

A global, seamless connectivity ecosystem is required to spur IoT adoption by businesses worldwide to deliver on the potential that this technology holds to transform the way we do business. We need to build a connected world rather than just a digital one.

Three strategies to create a customer centric culture and build a loyal customer base

Customer centric organizations that deliver superior customer experiences have one important success factor in common, they have loyal customers

BY RYAN TAMMINGA, VICE PRESIDENT OF CUSTOMER SUCCESS AT ALCHEMER

THESE BRANDS recognize that a world class customer experience strategy creates loyalty within their customer base, which in turn leads to growth and success. The best of the best brands empower their frontline leaders to impact the customer experience at the individual customer level.

When someone brings up brands that are known for delivering amazing customer experiences that drive customer loyalty, Disney is often the first example. The Disney Parks experience is curated like no other theme park. Disney recognizes that having a great theme park is not enough. They empower their frontline leaders across the organization to respond to individual customer feedback at the right time and to make a difference. That is what leads to superior customer experience which in turn drives lifetime loyalty.

With COVID-19 turning more customer experiences into digital experiences, customer centricity is more important than ever. Companies must appreciate and recognize that customers want to be valued and not seen as transactional. Here are three strategies to consider when building a customer-centric culture that enhances customer experience and drives valuable customer loyalty.

#1 – Deeply understand your customers

For companies to be truly customer-centric, it is

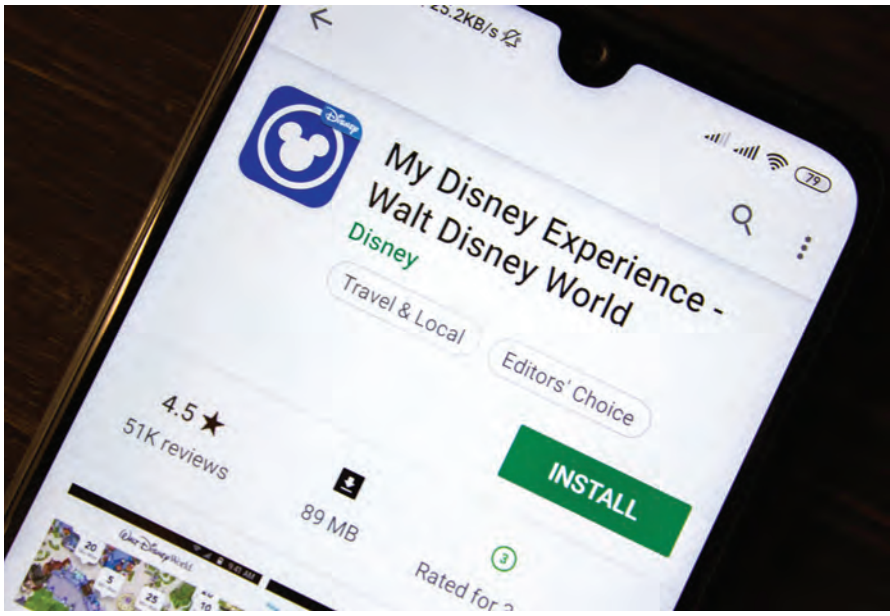
essential to collect customer feedback through the channels where your customers engage the most, and at every stage of the customer journey.
Your customers are more than a contact record in a CRM or a buyer persona. Seek to go beyond the boundaries of transactional relationships. Customers want to feel valued and heard. Be sure to consider the answer to this question, "how do customers know that their voice has been heard?" Collecting feedback from your customers is not what makes them feel understood. It is the personalized response from a business that proves they were heard and understood.

#2 – Amplify customer feedback company-wide

Customer feedback should be transparent and accessible to everyone. Democratizing feedback across the business allows everyone to participate in the customer experience, keeping in mind that at each point of the customer journey different departments may have an impact on the customer experience. Extend existing technology platforms, like a CRM, service management system, or enterprise messaging product by wiring in all customer feedback. This makes customer feedback accessible to everyone in the company from within the systems they use every day. Putting feedback into the systems employees use every day provides employees an enhanced view into the customer without disrupted their normal work routine. Providing unfiltered, individual feedback at this level helps ensure that the customer is the star of any company meeting, decision, or customer interaction.

#3 – Empower your frontline leaders to take action

Acting first on feedback from individual customers rather than looking to aggregated insights is essential to customer centricity. Closing the loop with individual customers in a timely manner is essential in earning that customer's loyalty. While it is useful to capture customer trends in dashboards and reports, it can hide the voice of the individual customer. This in turn can also delay the response to individual customer request, suggestion, concern, and compliment.
Can you think of a time where you spoke with a customer service representative on the phone and



they surprised and delighted you? Perhaps they listened to all of your concerns and made you feel heard. Or maybe they resolved your issue faster than you could have imagined. Those representatives were empowered to do what it takes to turn around your experience. This positive customer experience may have turned you into a loyal customer, and one who shares the experience with others.

Conclusion: Adopt customer-centric leading practices to drive customer experience and loyalty

Disney has built a fiercely loyal customer base and earned a customer-centric reputation because of the stellar customer experience they deliver. Customer-centric companies recognize the importance of providing customer feedback to their employees on the front lines to help them deliver superior customer experiences. Following the example of these brands by responding to individual feedback personally and empowering all employees is critical to achieving the mission of excelling at customer service. Doing so can help you stand in the good company of other customer-centric leaders and consistently surprise and delight your customers.

Customer feedback should be transparent and accessible to everyone. Democratizing feedback across the business allows everyone to participate in the customer experience, keeping in mind that at each point of the customer journey different departments may have an impact on the customer experience

Service collaboration:

The key to ongoing operational resilience

It's become a well-trodden phrase over the last few months – Covid has accelerated pre-existing business trends, with the shift to digital primary among them. For decades now, businesses have been slowly building their digital infrastructures, leveraging technology to drive innovation, improve business agility, and streamline operations.

BY DAVID POWNALL, VP SERVICES AT SCHNEIDER ELECTRIC

WHILE MOST still haven't realised the full potential of the Internet of Things (IoT), 2020 has acted as a galvanising force. It has spurred digital adoption to build resilience and the ability to monitor, diagnose and maintain operations remotely, in case of further shocks to the market.

Technology investment alone, however, is no longer enough – complete connectivity between, and visibility of, a facility, cybersecurity and physical security, sustainability, operational efficiency, and the workforce, is a necessity. Without it, the myriad of technological systems will prove ineffective, and decades of investment will be wasted. This level of connectivity and understanding is difficult to achieve. Rapid changes in technology, budgetary challenges, a scarcity of talent, and the increasing frequency of seismic market events make navigating the new era of digitalisation incredibly challenging. To improve cybersecurity, efficiency and sustainability and build long term resilience there are five key lessons:

Broaden and diversify internal initiatives

Cybersecurity, personal safety, and data security are clear priorities, but expertise across a broad spectrum of operational efficiency initiatives is equally essential. Although some initiatives stand out as immediately compelling, the reality is that many are intertwined, making them equally important and challenging. An honest look at internal capabilities, external resources, and ways to leverage a combination of both is a good step toward tackling initiatives.

Decisions on whether to tackle initiatives with internal or external resources are often made with a broad brush—meaning that some companies fall into the "do it yourself" camp and others default to hiring a third-party services provider to handle. A better way to approach these decisions is to assess whether the in-house skills have the right level of expertise. Then determine whether the tasks are making the best use of internal skills. In many cases, internal roles can perform higher-value work if an outside services resource is leveraged. Many perceive risk in hiring an outside firm because they fear this may result in layoffs. But in reality, a company's health is often dependent upon having skill sets that aren't in its core competency.

Connect facility and operational innovation with security

Physical security and data security are inextricably linked with facilities and operations management. As operating technologies are infused with connected products and digital platforms, the facilities and operations organisations become an integral part of cybersecurity and physical security. Protecting the organisation requires adhering to strong processes. It also requires advanced expertise and the ability to continually revise these processes, which will challenge the limits of internal staff resources.

An organisation's security depends upon including the firm's facilities and operations management with the same level of rigor as its IT and communications infrastructure. For these digitally transformed environments, it is essential to include facilities and operations leadership in decisions that impact the physical aspects of the organisation. Often, services organisations can develop and maintain best-in-class processes to ensure security.

Implement technologies that facilitate flexible management

One of the key trends over 2020 has been reducing onsite numbers. Engaging with third-party services can raise the fear of bringing new people into the facility who could present risk.
Shifting to remote management will alleviate this. The growth of and expansion to new locations and the increasing digitalisation of facilities, as well as the move to remote working, will make managing them a lot different in the future. Consider new ways of managing that rely on data-driven decisions.

Shifting to digital services is a major transition for organisations, especially mission-critical facilities that have built their reputations on their ability to protect physical facilities and ensure resilient operations. As proactive and predictive maintenance technologies mature, they bear consideration as they have the potential to reduce or eliminate downtime. And when downtime does occur, operations can be restored much more quickly. Having trust in the provider that the technologies are secure is an important consideration.

Find common ground with internal roles

Different roles have very different perceptions of how difficult initiatives are. For example, C-suite executives were most concerned about security threats to their infrastructure, while procurement manager, director, and VP roles indicated challenges to improving environmental impact/sustainability and finding the right talent to service new technology implementations as key concerns.

> Leveraging an external services provider can be helpful in making progress on shared goals.
> Seek experienced, industry specific partners. It is critical that your partner understands trends and challenges for your industry and brings in the appropriate technology, process, and talent to augment your current talent and operations infrastructure

Leveraging an external services provider can be helpful in making progress on shared goals.
Seek experienced, industry specific partners
It is critical that your partner understands trends and challenges for your industry and brings in the appropriate technology, process, and talent to augment your current talent and operations infrastructure. For every industry, there are unique challenges that can turn into obstacles if they aren't well understood. Specific operational challenges, regulatory and compliance demands, and environmental conditions exist for each industry.

A solution that is ideal for one organisation will not be viable for another. By using a partner that has a deep understanding of your industry and operations, it's possible to speed time to value and avoid potential pitfalls by leveraging the collective learning of others.

Data and analytics models have an expiry date – how can we update them?

By continually assuring the currency, accuracy, and relevancy of business-critical data and analytics models, organisations can better anticipate and solve whatever market and environmental challenges they may encounter.

BY BRET GREENSTEIN, SVP AND GLOBAL HEAD OF DATA AT COGNIZANT

HOWEVER, perishable data and analytics models make it much harder to predict and respond to unexpected events, for example sudden shifts in demand for products and services, the price or availability of raw materials or consumer sentiment.

Therefore, businesses that keep their data and analytics models fresher, can substantially increase not only their chances of survival, but of capturing a larger share of revenue and profits in the process. When a business can generate deeper and more accurate insights, it can therefore provide more value internally and externally.

For example, a convenience store chain that identifies which products are selling most quickly at their stores during the pandemic will be able to make sure that they have enough of those goods in stock to meet demand. They can also make decisions around the placement of those products, for example putting them near the checkouts so customers will spend as little time in the store as possible. This could also increase customer purchases of those products. But understanding data and model perishability goes far beyond traditional measures such as age or recency. So, what data classes as current, accurate and relevant?

Current enough data

Current data reflects the most recent changes that could have a significant impact on the business. These might include the loosening or tightening of COVID-19 lockdowns, or a call on social media for a protest near the business. Advanced artificial intelligence (AI) techniques such as machine learning can help find such data by, for example, identifying which data sources were used to generate the models.

These models are continually refined and use advanced AI to compare against “virtual twins” of the real world, so they are continuously learning rather than only being trained once. This avoids the risk of models becoming redundant, which is

what has happened to many predictive models that were based on pre-COVID consumer or employee behaviour and have not been able to adapt to the new circumstances.

Accurate enough data

This is data that has been cleansed and validated to ensure it comes from an accurate source, has not been compromised and is in a usable format. This is especially important for data in non-traditional forms, such as unstructured data, or from newer sources such as social media or the Internet of Things (IoT). Such data can often be the source of important insights, such as when mobile phone location tracking data is used in addition to COVID-19 testing data, to better track the spread of the disease and new infections.

Accurate models have not only been tested for accuracy under current conditions, but they can also use advanced AI to provide more accurate predictions. If a prediction is low-confidence but could have massive consequences, such as an outflow of millennials from urban areas due to COVID-19, a business could get a low-cost jump on competitors by being the first to plan for such a trend.

For example, an analytics model that "discovers" weekly or seasonal patterns in financial trading is of little use if competitors have already found that pattern and adjusted their own trades to account for it. Therefore, models that are accurate have also been trained to disregard patterns in the data when they cease to be relevant.

Relevant enough data

This refers to data that is significant enough to have a meaningful impact on predictions of future conditions or the steps it recommends to respond to them. As an example, before the "Me Too" movement, an insensitive tweet by a CEO might not have been considered a relevant data point to track. Today, the boycotts against such a tweet could drive material changes in revenue, market share, and brand value. Relevant data is drawn from anywhere, within or outside of the organisation and it can help the business be the first to sense and respond to change.

By developing and refining relevant models, organisations can determine, with the help of machine learning, which data is most insightful and disregard less useful data. Even more importantly, it helps contribute towards costs and time saving, particularly when it comes to eradicating the effort spent on training models on irrelevant data.

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Enterprise database:

bottleneck to achieving business agility?

Around the world, C-suites know they will have to get up and running very quickly in a "new normal" that will be very different than the way business worked even at the start of 2020.

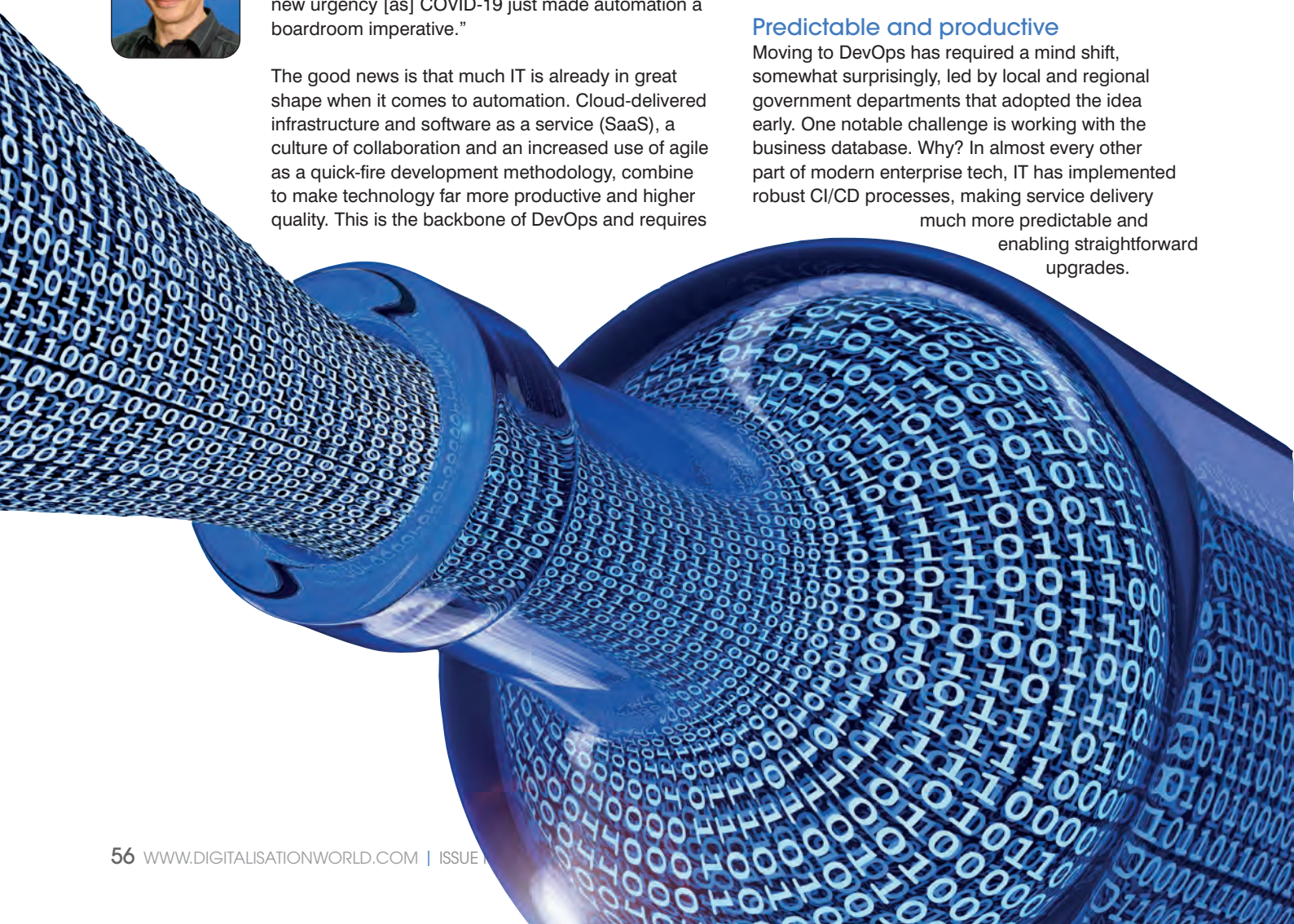
BY JOHN POCKNELL, DATA SOLUTIONS EVANGELIST, QUEST SOFTWARE

KEY TO MAKING RECOVERY WORK will be increased enterprise use of automation. As Forrester notes: "Automation has been a major force reshaping work since long before the pandemic. Now, it's taking on a new urgency [as] COVID-19 just made automation a boardroom imperative."

The good news is that much IT is already in great shape when it comes to automation. Cloud-delivered infrastructure and software as a service (SaaS), a culture of collaboration and an increased use of agile as a quick-fire development methodology, combine to make technology far more productive and higher quality. This is the backbone of DevOps and requires a very efficient continuous integration/continuous delivery (CI/CD) pipeline of application creation, versioning, build, testing, quality assurance (QA) and deployment.

Predictable and productive

Moving to DevOps has required a mind shift, somewhat surprisingly, led by local and regional government departments that adopted the idea early. One notable challenge is working with the business database. Why? In almost every other part of modern enterprise tech, IT has implemented robust CI/CD processes, making service delivery much more predictable and enabling straightforward upgrades.



Businesses love this as it enables them to increase their ability to respond to changing market dynamics and customer sentiment and to innovate faster to be more competitive. The sticking point, regrettably, remains the vital work on the database side. CI/CD is not just about building databases and applications faster and more reliably, it also entails managing end-point risk.

When an enterprise has spent time and resources building a new, competitive application, any unplanned bugs or usability issues mean those IT teams returning to the beginning of the process to work out where the faults lay. This backtracking is not only tedious and expensive, it could actually prevent the enterprise responding to, or benefiting from, market change. After all, the most expensive place to fix a problem is once it is in full production. Instead, creating the new application in chunks that could be tested, fixed and sent quickly would be a much safer and more efficient way of working. Being able to build and release changes through an automated CI/CD pipeline for both applications and database management systems would boost business IT significantly.

Manual for too long

It is undeniably easier to implement CI/CD processes on the application side. Applications don't have data, instead they're essentially codified business rules. Databases are different and more complicated, because data is continually changing. When database changes are being implemented, the change that took place during the implementation process must be reconciled with the live system otherwise there is a chance of the updated system being flawed.

With so much business emphasis on big data, it's an imperative to process masses of information on customer behaviour and sentiments, preferably captured in real time so the insights derived are as fresh and deep and accurate as possible in order to drive growth. It is this that is driving the need for faster change management.

Until businesses align their database work with their other software delivery processes, they are less efficient than they could and need to be. The good news is there are techniques and solutions available that provide ways of making the database change management process slowly but surely start to look more like CI/CD.

Emulation is the first place to start, automating a lot of traditionally manual database build and deployment processes. This means IT professionals can start to converge what happens on the application side and what happens on the database side into a single software delivery pipeline. I've known companies that have reduced their delivery cycles from eight weeks down to two just by following this automated process for their database changes.

In addition, this approach boosts the overall quality, integrity and performance of database code, thus reducing production defects that would otherwise introduce unplanned business costs and disruption. If senior IT leaders start by assessing all the database code testing and QA work they need, and implement standardised testing routines and standards that can be automated, like application development teams have been doing for some time, the benefits are immediate. Speed of delivery will go up, risk of failure will reduce with an increasing ability to pivot plans at short notice.

And as chief information officers and their teams draw up plans for the new normal, slashing production defect rates, increasing transparency and making data as agile as other parts of the business will really ease their load.

Cyber insurance:
the shift from luxury to necessity

It's undeniable that cybercrime is quickly becoming one of the biggest threats to businesses today. By Aleksander Jarosz, Threat Intelligence Analyst at EclecticIQ,

THE NUMBER OF CYBER-ATTACKS taking place has steadily been increasing over the last couple of years, and the pandemic has hugely accelerated this. For example, a recent report from IBM found that the number of ransomware attacks in the second quarter of 2020 more than tripled compared to the previous quarter.

The pandemic is forcing change within organisations across all sectors, and in many cases, this can be seen in the rapid rise in the number of employees having to work remotely. Employees working from home and accessing files on both corporate and personal devices significantly increases the risk of cyber threats to businesses, and hackers are taking advantage of this. As a result, it's more important than ever businesses take the necessary precautions to protect themselves against the wide range of scams and hacks that are frequently being experienced by organisations across every sector.

One risk management solution available is cyber insurance. It's been around in the UK since the mid-2000s, but for many businesses is still a relatively new area and one that is not widely understood. Due to the significant increase in cyber incidents around the world, the cyber insurance market is expected to grow by 33% annually over the next five years.

However, for this to become a reality there needs to be a cultural shift in the way that cyber-attacks are viewed. While cyber criminals are becoming increasingly intelligent and creative with their scams, in contrast, security budgets are being slashed and teams are being stretched and placed under increasing strain. Businesses need to understand that while preventative cybersecurity measures are essential, they also need to accept that cyber-attacks can and will still happen. Therefore, organisations need to consider what method of protection will be in place in the event of a breach.

This article will discuss the specifics of cyber insurance and the pros and cons of investing in it.

What is cyber insurance?

Cyber insurance is usually a standalone policy offered by an insurance company to protect a business or an individual. This form of protection identifies the specific financial costs which may arise out of a potential cyber threat and transfers the costs to an insurer. Cyber insurance largely covers damage across two areas; direct or first-party losses resulting from a data breach, and third party costs such as customers or service providers who have also incurred costs as a result of the incident.

The coverage that is provided will vary depending on the different insurers and products being offered. However, in general, cyber insurance packages include cover for:

- Business interruption and data restoration costs
- Legal costs relating to the data breach, either by incurring regulatory fines, or potential lawsuits
- PR costs to deal with any reputational damage that a large scale cyber-attack may cause
- Costs incurred as a result of the forensic analysis of a cyber-attack

What kind of exemptions exist?

If companies are looking to invest in cyber insurance, they need to ensure they're being thorough and reading the fine print before committing to a policy. As with any kind of insurance, certain cyber policies will have exemptions which may put the customer at risk of not being covered during a major attack.

For example, a common exemption phrase used by insurers is "acts of war". In 2017, the US pharmaceutical group, Merck was subject to a cyber-attack which crippled more than 30,000 laptops and desktops, as well as 7500 servers. Merck was denied over a billion dollars in coverage due to insurers claiming the "acts of war" clause had been breached.

A less common but equally important exemption to be aware of is policies which only cover "non-targeted cyber-attacks". While these policies are relatively rare, they're worth mentioning due to the frankly useless nature of them.

Another cause for concern is around the variety of attacks that cybercriminals can currently employ which reinforces the importance of finding the right policy with the appropriate cover for your company. Driven by forums on the darkweb, cybercriminals are now able to access better tools and malware, which has led to the capabilities of the average 'hacker' growing extensively over the last few years. Businesses need to be especially aware of the various attacks at play and choose coverage accordingly.

What are the alternatives to cyber insurance?

There are several arguments which are regularly used against cyber insurance as a form of protection. For example, if a company experiences a cyber-attack that places malicious code within the network, baseline recovery costs are immediately incurred, whether this is in human labour or new software or hardware.

However, cyber insurance policies typically only cover costs beyond this 'baseline' and subsequently cyberattacks remain expensive. Cyber insurance should not be viewed as a cure-all solution, and the goal should still be to prevent cyberattacks. Since this is not always possible, adopting security practices alongside cyber insurance is still the best option. Additionally, in the event of a data breach, the company under attack can often suffer significant reputational damage. If an insurer pays out, then businesses can use this to recoup costs relating to Public Relations and other reputation management tools as mentioned above. Unfortunately, in many cases, the damage is already done, and any current or potential future customers may be put off or have lost trust in the business.

While this is certainly a valid argument, it fails to factor in that cyber insurance is the only cyber protection strategy which does exactly what it says on the tin. Cyber insurers are not trying to claim that a data breach won't happen under this strategy, or that insurance should be viewed as an alternative to cyber security measures.

Cyber insurance should be used in conjunction with cyber security and other risk management strategies. Despite this, it's important to remember that however much money or resources companies invest in cybersecurity tools, these are preventative measures, and a data breach can obviously still occur. Therefore, businesses must invest in cyber insurance, as in the event of an attack, many other cybersecurity strategies will be redundant at this point.

Given the increased risk and scale of cyber incidents, businesses now need to be considering not whether they should invest in cyber insurance, but instead what kind of policy is right for them. The appropriate coverage on a cyber insurance policy can now mean the difference between a company surviving a cyber-attack or going under because of it.

Covid-19 and the holy grail of IT asset management

In the wake of COVID-19 lockdown orders, enterprise IT governance has become more critical – and complicated – than ever before.

BY ROEL DECNEUT, CMO AT LANSWEEPER

BUSINESSES FACE increased security risks as employees use home networks to access work data, files and applications - introducing potential network vulnerabilities via personal and home devices.
Not only is IT governance essential to the security of an organization, it has a direct impact on other key priorities - including, amongst other things, profitability.

Without proper IT asset management (ITAM), an organization's IT footprint grows uncontrollably, leading to security challenges, cost inefficiencies and management challenges.

Unused or outdated devices can add to operational overhead, wasting resources and unduly inflating the cost of software licenses and services.
Nearly 66% of IT managers have an incomplete record of their IT assets, and of all the hardware and software assets in an enterprise, about 30% are considered "ghost" assets – missing and cannot be found.

What's more, additional "shadow IT" – IT infrastructure and services implemented without formal approval from the organization's IT department, will increasingly be funded by business units. This means IT governance at the corporate level will be even more

critical for tracking and monitoring assets on the network, to protect against security threats and vulnerabilities.
It's essential that companies have and are able to maintain a centralized, complete view of their IT Assets; or they will become liabilities to an organization's security posture and ultimate financial success.

ITAM is at the Core of IT Governance

Governance bodies that regulate enterprise IT strive to mitigate the risks and costs of neglected, outdated and vulnerable assets, and provide frameworks for defining how organizations implement, manage and monitor their IT infrastructure.

Achieving certifications in these frameworks are milestones to organizational maturity. Many larger enterprises won't adopt technology from companies that do not have certain certifications, and failing to comply with data privacy mandates can result in hefty fines.

Some of the most important IT governance frameworks and regulations include:

- The Center for Internet Security (CIS) outlines 20 best practices dubbed CIS Controls™ that aim to address and prevent the most pervasive and dangerous enterprise security threats.
- ISO 27001 is an international standard that helps organizations manage IT asset security and provides a management framework for implementing an information security management system (ISMS) to ensure the privacy, integrity and availability of corporate data.
- The Information Technology Infrastructure Library (ITIL) is a set of detailed practices for governing IT service management (ITSM). This framework focuses on aligning IT services with the needs of business by defining processes, procedures, tasks and checklists that help organizations improve the value of their services rather than just provide IT capabilities.
- COBIT is a framework for helping businesses achieve key objectives for IT governance and asset management. COBIT 2019 offers guidelines for improving enterprise governance and management, particularly as more organizations are migrating mission-critical workloads to the cloud.
- NIST has a set of frameworks for various aspects of ITAM, including NIST SP 1800-5, NIST SP 800-53, and the NIST Cybersecurity Framework. All are designed to help organizations protect critical infrastructure.
- Data privacy mandates such as the EU's General Data Protection Regulation (GDPR) regulate how organizations collect and store individuals' personal data.

At the core of all of these frameworks is an essential activity -- creating a complete and accurate hardware and software asset inventory. This best practice is listed as a top priority in CIS, COBIT, ITIL and ISO certification guidelines for one very obvious reason: If you don't know what you have, you can't manage or protect it.

Governance bodies that regulate enterprise IT strive to mitigate the risks and costs of neglected, outdated and vulnerable assets, and provide frameworks for defining how organizations implement, manage and monitor their IT infrastructure

CFOs and CISOs Share Responsibility for ITAM

Given the cost and risk associated with subpar ITAM, CFOs are now intimately invested – and in most cases responsible for – enforcing IT governance.
CFOs need to understand how many assets the organization owns, whether or not they're being used, how they're being used, and how to maximize vendor contracts.Having a single source of truth and an accurate record of all hardware and software assets, as well as details about how they're configured and who's using them – and whether or not they require updates or need to be retired – is essential to controlling IT spend and ensuring IT investments align with and support business objectives. This is no longer just an operational IT challenge.

The End Goal: A Productive Workforce

2020 has upended businesses in many ways, and IT is at the center of the disruption. With more people working remotely and relying on cloud-based software services, cybersecurity, data privacy and IT spend will all continue to come under scrutiny.

IT governance and ITAM is therefore an imperative, and organizations will be putting more effort toward this area moving forward. Leveraging technology to create a complete IT asset inventory makes compliance with IT governance frameworks possible – reducing risk and spend.

Gartner reports that knowing the status of your IT assets at all times enables proactive management that reduces risk, reducing IT spend by up to 30%.
More importantly, it ensures employees have secure access to the updated, operational digital assets they need to be productive and effective. And that's really the holy grail of effective IT governance.

SDC AWARDS 2020

SDC Awards celebrate IT innovation

NO NEED TO DRESS UP, no debate as to what might or might not constitute a 'substantial meal', no comedian (although the dw editor stepped up to the plate with a couple of jokes, and was told 'don't give up the day job'!), And no late night dancing or friday morning hangover – this year's sdc awards was unlike any other. With the pandemic preventing a physical gathering, the sdcawards went virtual, and we're delighted to say that the feedback has been universally positive. A big thank you to all of our sponsors, and a big thank you to all those companies who entered the awards (we had a record entry), and all those who voted. Read on to find out who won what, and do take the time to follow the link to the award winners' videos. And here's to meeting up this year to celebrate innovation physically, rather than virtually!
https://sdcawards.com/winners/2020

SDC AWARDS 2020

AWARD	WINNER	RUNNERUP
Excellence in Service Award	Digital Cloud UK	Curvature
Vendor Channel Program	ExaGrid	SolarWinds
Managed Services Provider Innovation	Altaro Software	Mobliciti
IT Systems Reseller/Managed Services Provider	INFINITY IT Solutions	SCC
Data Security/Compliance Innovation	Asigra, Inc.	Benefit Vantage
Business Continuity/Disaster Recovery (BC/DR) Innovation	Pure Storage	Open-E
Storage Hardware Innovation	ExaGrid	iXsystems
Storage Management Innovation	Visual Storage Intelligence	Pure Storage
Hyper-convergence Innovation	Supermicro	NGD Systems, Inc.
Backup/Archive Innovation	Bridgeworks	Index Engines
AI/Machine Learning Innovation	Schneider Electric	Netacea
Augmented/Virtual Reality Innovation	Zensar Technologies	SML Group

SDC AWARDS 2020

AWARD	WINNER	RUNNERUP
Orchestration/Automation Innovation	Anuta Networks	LogicMonitor
Data Analytics Innovation	Pure Storage	Schneider Electric
Open Source/DevOps Innovation	Zensar Technologies	VMware
Cloud Platform Innovation	iboss	OVHcloud
Cloud Storage Innovation	Fungible	Qumulo
Cloud Security Innovation	BitDam	Sequitur Labs
Cloud Automation Innovation	Cloud Maker	Pulseway
Software-as-a-Service Innovation	IPC Systems	The Business Software Centre
Hosting/Colocation Innovation	Hyve Managed Hosting	Equinix
Business Continuity/Disaster Recovery (BC/DR) Project	Scality	NetApp
Digital Transformation Project	Zensar Technologies	Node4 and Stagecoach
Cloud/MSP Project	Pulsant	Six Degrees
Remote Working Project	Hyve Managed Hosting	Tata Communications
Storage Company	ExaGrid	Qumulo
Cloud Company	Hyve Managed Hosting	iLand
Digital Transformation Company	Fungible	SaltDNA

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DCS AWARDS

Virtual awards recognise real innovation

NO NEED TO DRESS UP, no debate as to what might or might not constitute a 'substantial meal', no comedian (although the DCS editor stepped up to the plate with a couple of jokes, and was told 'don't give up the day job'!), and no late night dancing or Friday morning hangover – this year's DCS Awards was unlike any other. With the pandemic preventing a physical gathering, the DCS Awards went virtual, and we're delighted to say that the feedback has been universally positive. Okay, so we'd love to be able to meet up in person during 2021 to celebrate the data centre industry's achievements; but for 2020 our virtual awards ceremony was as good a way as possible to recognise an industry which has gone above and beyond during the pandemic. A big thank you to all of our sponsors, and a big thank you to all those companies who entered the awards (we had a record entry), and all those who voted. Read on to find out who won what, and do take the time to follow the link to the award winners' videos and, yes, the editor's (intended) comedy routine is also available for viewing!
https://dcsawards.com/winners/2020

DCS AWARDS 2020

AWARD	WINNER	RUNNERUP
Data Centre Consolidation/ Upgrade/Refresh Project	Power Control supporting Amito	IDAC Solutions supporting Hyperion
Data Security/Compliance Project	Stafford Railway Building Society Supported by ANsecurity	South Hams District Council & West Devon Borough Council supported by Pulse Secure
Data Centre PDU Innovation	Server Technology, a brand of Legrand	Chatsworth Products International
Data Centre Physical Security Innovation	Oberon, a division of Chatsworth Products	Raritan, a brand of Legrand
Data Centre Industry Contribution	Tor Kristian Gyland – Green Mountain	Abdullah Saleh Alharbi – Saudi Aramco
Cloud Project of the Year Award	Friedhelm Loh Group supporting Gaia-X programme	Mphasis
Managed Services Project	Rackspace Technology supporting Relay42	Hyve Managed Hosting supporting the National Television Awards
Data Centre Intelligent Automation and Management Innovation	Schneider Electric	RiT Tech

DCS AWARDS 2020

AWARD	WINNER	RUNNERUP
Data Centre Physical Connectivity Innovation	Corning Optical Communications	Legrand
Data Centre Safety/Fire Suppression Innovation	Johnson Controls	Solar Fire Systems
Edge Computing Innovation	Pluribus Networks	Huawei
Data Centre Hosting/ Co-location Supplier	Node4	IP House
Data Centre Cloud Vendor	Rubrik	NEC Technologies India Private
Data Centre Facilities Vendor	Huawei	CBRE Data Centre Solutions
Data Centre ICT Systems Vendor	Spectra Logic	Parallels
Data Centre Security/ Compliance Vendor	Portshift	N2WS
Data Centre ICT Security Product	Digitronic computersysteme GmbH	RDS-Tools
Data Centre ICT Networking Product	Bridgeworks	Raritan, a brand of Legrand
Data Centre ICT Compute Product	RNT Rausch GmbH	SQream
Data Centre ICT Automation/ Orchestration Innovation	RIT Tech	Apstra
Data Centre Managed Services Innovation	Yellowbrick Data	Asigra Cybersecure Cloud OpEx Backup Appliance
Data Centre Engineer	Samuel Smith – Sudlows	Abdullah Saleh Alharbi – Saudi Aramco
Data Centre Power Innovation	Huawei	Starline, a brand of Legrand
DC ICT Storage Product	Open-E	Huawei Technologies
Excellence in Data Centre Services Award	Kohler Uninterruptible Power	Teledata UK
Data Centre ICT Cloud Storage Innovation	Altaro	TeleData UK
Data Centre Energy Efficiency Project	TeleData UK supporting the Business Growth Hub	CBRE supporting Bedford Data Centre CRAC Unit
Data Centre Cooling Innovation	Asperitas	Usystems
New Design/Build Data Centre Project	Batelco (Bahrain Telecommunications Company	Green Mountain
Hosting/Co-location Innovation	Iron Mountain Data Centers	CyrusOne

DCS AWARDS

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dca The data centre trade association

DW DATACENTRE SOLUTIONS

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Events in IT Outsourcing

Introducing Data Centre Alliance special interest groups

The DCA was formed over 10 years ago, following consultation between industry leaders the DTI, RDA and EU Commission. The aim was to create a trade association which was completely inclusive, independent and vendor neutral that would represent the interests of the entire data centre community. This includes private data centre/server room owners, consumers of data centre 3rd party services and suppliers providing products and services to the data centre sector. The DCA continues to evolve and adapt to support both its members and the sector.

Steve Hone
CEO DCA – Data Centre Trade Association

THROUGH The DCA, organisations operating their own data centres and server rooms can access trusted information on the benefits of adopting best practice and in turn learn more about the products and services available to them. This supports them as they strive to drive down operational costs and increase the efficiency of their IT assets in support of their business goals.

One of the many ways a Partner can be to be heard and raise their profile in the DC Sector is to become a member of one of the DCA's Special Interest Groups or SIG's. There are currently nine DCA SIG's; each one focuses on a key area of interest. Each SIG is headed up by a 'Chair' with a neutral but good knowledge of the area of focus. The Chairs aim to guide the groups and to ensure agreed outcomes are achieved which will collectively benefit the sector.

The SIG Chairs also make up the DCA Technical Council. The purpose of the DCA Technical Council is to encourage and foster collaboration between fellow members and industry experts to provide:

- Consumer guidance and confidence,
- Promote the use of best practice in all its forms
- Contribute to the development of Standards,
- Encourage research and innovation
- Communicate the vital and valuable role that DC's have in supplying digital services

Over the next year the DCA will be providing updates on each of the Special Interest Groups, this will include a comment from the Chairs detailing the groups achievements to date and plans going forward, this will also be provided as a summary video interview, finally two articles from Group members related to the SIG Topic will also be available to

provide additional background information and to allow knowledge sharing. Look out for the monthly updates in Digitalisation World.

DCA Special Interest Groups include:

- Colocation Working Group
- Data Centre Commissioning SIG
- Energy Efficiency SIG
- Sustainability SIG
- Anti-Contamination, Filtration & Cleaning SIG
- Certifications Requirements Working Group
- Physical Access and Cyber Security SIG
- Workforce Capability & Development SIG
- Thermal Management SIG

Overview of DCA SIG Group

Colocation Working Group

Chaired by Dan Scarbrough MD at RockScar Ltd

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

The objective is to:

- 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.

Data Centre Commissioning SIG

Chaired by Prof. Ian Bitterlin, Consulting Engineer & formerly Visiting Professor, University of Leeds

ALL BUILDINGS undergo commissioning or tenant checks prior to the new owners taking possession or new tenants moving in, these checks ensure that all building systems (fire, security, environmental and IT systems) are working and meet the required specifications; in a mission critical facility such as a data centre these IST checks are of paramount importance. The Data Centre Commissioning Special Interest Group (SIG) has therefore been formed to increase awareness of the best practices which should be adopted to mitigate risk of failure and optimise the chances of project success.

DCA Energy Efficiency SIG

Chaired by John Booth, BSc (Hons) Tech (Open), CDCAP, MBCS, Visiting Lecturer, Birmingham City University, TCT7/3 EUCOC, SDIA

ALL DATA CENTREs use energy, in some cases significant amounts, and globally there is an increasing focus on data centre energy consumption and as a result, pressure from consumers, business and governments to do more to reduce data centre energy use.

The Energy Efficiency SIG (one of the longest standing DCA SIGs) has in the past kept a close eye on ISO standards (ISO30134, ISO22237), European Standards, (the EN 50600 series) and the EU Code of Conduct for Data Centres (Energy Efficiency) best practices. Committee members represent the DCA on the appropriate standing committees for all the standards mentioned.

The Energy Efficiency SIG used to also have Sustainability in its title but due to its increasing importance this has now become a separate group.

So, the Energy Efficiency SIG focus has changed somewhat and, in the future, will maintain its watching brief on the Standards, but also look at heat extraction and cooling solutions in the data centre where they touch on smart cities, waste heat re-use options and energy flexibility solutions. The EE SIG is in the process of developing an energy efficiency guide that will be published by the DCA. The Energy Efficiency SIG is the first port of call for all thing's energy related in the Data Centre and works closely with other SIGs such as the Sustainability, Thermal Management, Commissioning and Certifications Groups.

Sustainability SIG

Chaired by Astrid Wynne, Sustainability Manager at Techbuyer

THE PURPOSE of the Sustainability Special Interest Group is to develop best practice in the UK data centre industry with respect to materials usage, energy efficiency, skills development and workforce retention in an operational data centre environment.

The group aims to achieve this through:

- Optimising energy efficiency at use phase
- Expert insight into IT hardware and the effect on energy draw
- Insight into the role of IT load with respect to this, including

a. The effect of full utilisation on efficiency as measured by compute power over energy
b. The ability of software to dematerialise hardware
c. Minimising data transfer and storage, potentially leading to a sector Code of Conduct

- An understanding of the importance of Scope 3 emissions (also known as embodied energy) in the hardware, facility and building
- Circular solutions for the IT hardware and other infrastructure
- Circular solutions for heat, power and IT load
- Use of renewable energy in the sector
- New technologies that can aid this
- Existing and upcoming standards relating to this
- Education of workforce with respect to sustainability insight and practice

Anti-Contamination, Filtration & Cleaning SIG

Chaired by Gary Hall, Operations Director at Critical Facilities Solutions UK

THE DCA - Anti Contamination, Filtration & Cleaning SIG is chaired by Gary Hall of Critical Facilities Solutions.

This SIG discusses, advises and recommends practical solutions on the control of dust, dirt and contamination. Preventing damage to equipment; loss of data and conservation of energy.

This SIG has been very active for the last two years and have produced two Anti-Contamination Guides, Covid-19 Information – Advice on keeping Data Centres clean and Safe, EU Code of Conduct for Data Centre (Energy Efficiency) 3.2.12 – Manage Air Quality, Information on Data Centre Cleaning – Q&A, Future of Data Centre Cleaning and Data Centre Cleaning Selection.

Certifications Requirements Working Group

Chaired by Steve Hone, CEO DCA

THE DCA Certification Group work to review and update the base line criteria for the DCA Certification Scheme. They monitor the Standards Development Organisations (SDOs), the EU Code of Conduct for Data Centres (Energy Efficiency) best practices committees, and the outputs of the other DCA SIGs to formulate the assessment criteria for the scheme.

Members review the individual standards, best practices and guidelines on an annual basis or when significant revisions to the baseline criteria are required as a result of external activity, for instance the publication of a new or revision to an existing standard, this ensures that the DCA Certification is always up to date and is viable for external parties and owners and operators to adopt at a reasonable cost.

The assessment criteria is currently based upon the ISO 30134 series of Data Centre KPI's, the EN 50600 series of Data Centre Design, Build and Operate standards, the EU Code of Conduct for Data Centres (Energy Efficiency) and the outputs of the DCA – Anti Contamination, Filtration and Cleaning SIG (Cleaning Regime) and DCA Commissioning SIG (Mains Utility Failure Test).

Membership is by invitation only.

Physical Access and Cyber Security SIG

Chaired by Richard Pearman, General Manager, Diversified Technologies at Southco, Inc.

THE DCA Physical Access and Cyber Security SIG is aimed at security professionals working in the Data Centre Sector.

The Physical Access and Cyber Security SIG formally the Site Access Control & Security Steering Group was set up to collaborate on best practice, standards and guidelines on data centre physical security, access control and crucially important topic of Cyber Security.

Physical security includes important items such as fencing, gating, anti-intrusion defence, man and vehicle traps, biometric and PIN access controls, surveillance, security process and management, rack security caging, personnel background checks and associated systems.

Workforce Capability & Development SIG

Chaired by Steve Bowes-Phipps, Senior Data Centre Consultant at PTS Consulting and DCA Advisory Board Member

THE DIGITAL services economy is now a vital part of the backbone of life; enabling enterprise, joining up communities and supporting new ways of living, working and playing, as evidenced during the Covid-19 pandemic. Yet, hardly anyone, when asked, selected the Data Centre sector as a career destination of choice, and places of learning (schools, colleges, universities) know little about it and are therefore unable to prepare tomorrow's generations of Data Centre engineers/sales & marketing/product development/etc. for the incredible demand for talent that exists now and for the foreseeable future.

So the Workforce Capability and Development Special Interest Group (SIG) is a place where anyone who has an interest in this or ideas to share, can come and look at concrete and tangible ways of providing signposting to resources, reaching out to schools, universities, etc and developing an annual ten point plan for increasing inclusion, diversity and raising awareness of both what Data Centres are, why they are so important and the fantastic range and value of jobs that exist within the digital infrastructure economy. Too much is being done in silos and this is only going to be fixed by working together on solutions, to quote Spock in Start Trek 'the needs of the many, outweigh the needs of the few'.

Thermal Management SIG

Chaired by Dr Jon Summers, Scientific Lead in Data Centres at RI.SE. and DCA Advisory Board Member

TODAY there are literally millions of traditional air-based cooling systems in data centres and server rooms of all shapes and sizes around the globe and given their prevalence this is unlikely to change for many years to come.

There is no shortage of research going into the optimisation of these air-based systems as the pressure to increase performance and energy effectiveness continues to grow. This has resulted in the development of not only free air cooling, which increases in popularity where external environmental conditions allow, but also a comprehensive range of indirect hybrid solutions that offer even greater flexibility and potential cost savings. Increased environmental pressures have also seen research and development increase into the prospects of harvesting and reusing the waste heat produced by the server/compute components.

Simple physics dictates that at some point an air-based system, irrespective of however efficient you make it, will be challenged by implementation practicalities. As processing speeds and power densities continue to steadily rise, there is an increasing interest in the adoption of liquids as the thermal energy transfer medium, which includes technologies based on direct to chip/CPU cooling through to fully Immersed and double immersed liquid cooling solutions.

One thing you will quickly learn is that "No one solution fits all applications" and as a result, unless you know exactly what you need, the landscape quickly becomes confusing. The Thermal Management Special Interest Group has been formed to assist consumers with understanding their options so more informed decisions on what is best for your own business needs can be made.

To find out more about The DCA and its SIG's please contact: info@dca-global.org, or visit www.dca-global.org/groups or call us on +44 (0)845 873 4587

A Circular Economy argument on the way to being resolved

Rich Kenny
IT Director at Techbuyer

WHEN TALKING ABOUT the Circular Economy, it's always good to start with the "why", so here goes... Earth Overshoot Day (when humanity's demand for ecological resources that year exceeds the amount what Earth can regenerate) is 29th July in 2020, but this is a global average. In most developed countries, the date will be a lot earlier (mostly clustered between March and May), meaning we are using over double our budget when it comes to the environment. Unless we change our approach to one of reusing, repurposing and recycling, there will be serious consequences. The other side of the coin is that transitioning to a circular economy will improve the security of raw materials supply, increase competitiveness, stimulate innovation, boost economic growth and create 580,000 jobs in the EU alone according to the European Parliament.

The Carbon Cost of Digital

A significant proportion of this is tied to the manufacture of our hardware. Around 121 million servers are due to be deployed between 2019 and 2023. Each one of these contains a high proportion of steel, aluminium and plastic, three of the top five materials for industrial greenhouse gas emissions worldwide. In addition, servers and other IT hardware contain copper, gold and 12 of the 27 materials identified by the EU as in low or politically unstable supply.

According to the European Commissions' JRC Science and Policy Report, the percentage of materials that are recoverable by conventional recycling technologies ranged from 0% to 93%. Many rare earths are in the "zero" category, which may be why there have been moves towards deep sea mining as an alternative. Neither solution seems optimal and the second raises the possibility of further environmental harm.

Shining a light on materials usage

As a company that specialises in buying, refurbishing and selling servers, storage and networking, Techbuyer has a strong interest, and knowledge of, materials usage. In January 2020, we became an Associate Partner in the CEDaCI project, a three-year collaboration between industry and academics from the entire supply chain

for equipment in the data centre sector. Running across France, Germany, the Netherlands and UK, it aims to provide solid data on the materials usage involved, increase recovery rates and provide a decision-making tool for upgrades and refreshes.

Materials usage in the sector is an important issue given the high refresh rate in many data centres. However, finding reliable information on this is no easy feat. For one thing, Original Equipment Manufactured servers are assembled using components from a wide variety of suppliers, not all of whom publicly release the materials contained within them. In addition to this, is the myriad of makes and generations in the market at any one time, which will all vary slightly. There is good information from organisations such as Deloitte but these are relatively old. Given the high rate of manufacturing technology the information is likely outdated now.

What about Carbon Emissions?

In amongst all this is the energy question. $1 invested in digital technology in 2019 resulted in 37% more energy consumption than it did in 2010. CO_2 emissions from the sector have risen by around 450 million tons since 2013 in OECD countries, whereas global emissions decreased by 250 million tons in the same period. A significant amount of this are Scope 3 emissions from the pre-use phase. However, emissions at use phase cannot be completely ignored. While most of the hyperscalers are striving toward 100% carbon neutral energy mixes, not all of the smaller players are able to follow suit yet.

Running alongside this is the data we have on server refresh and the impact of energy efficiency, which we know is significant. A recent study from the Uptime Institute shows that aging IT kit (older than five years) accounted for 66% of IT energy use but contributed just 7% of the compute capacity over 300 sample data centres. As the sector accounts for

around 20% of the digital contribution towards greenhouse gas emissions, which in turn account for 3.7% of total global emissions, this is significant. By 2025, the impact of the digital sector is expected to rise to 5.5% and possibly 8% in the worst-case scenario. This means we need to do everything we can both to save on manufacturing emissions and materials and optimize efficiency at use phase… which is no easy feat.

Balancing the books

Help is at hand in the form of recent research carried out by Techbuyer in partnership with the University of East London. Beginning with the premise that refreshing IT hardware is an environmental as well as a business imperative, we set up a Knowledge Transfer Project co-funded by Innovate UK in order to discover the best solution on this from a performance, efficiency and environmental standard. In blunt terms, we wanted to find out if data centres need the latest and greatest in order to reap the full benefits on the energy bill and bottom line.

The answers we found were interesting. For one thing, we demonstrated that there is no discernable difference comparing like for like refurbished and new equipment. For another, we demonstrated that a previous generation of server was able to outperform the latest generation in terms of both performance and energy efficiency with the addition of extra RAM and an upgrade on the processor.

While this won't apply to pre-2015 servers this does demonstrate that performance gains can be made by upgrading existing hardware at component level. Initial study demonstrates that performance gains can be made by upgrading existing hardware, saving on materials use without losing on energy.

Our initial findings are groundbreaking because it proves that the right approach to systems can yield great results when it comes to efficiency, compute power and the bottom line. This is particularly important because the energy intensity of digital is predicted to rise by 4% per year, in contrast to global GDP's energy intensity, which is reducing by 1.8% year on year. If our sector adopts more sustainable solutions, we could make a massive difference overall.

Where next?

One of the best things to come out of our work with the University of East London is a confidence in component level upgrades. We are about to apply a similar mindset to laptops. The average lifecycle on these is around three years, by which time the hardware is often outpaced by software performance gains.

Upgrading at component level rather than buying a complete new machine saves significantly on outlay as well as keeping resources in use for as long as possible. We are confident we can push a laptop's lifecycle to up to six years; something that environmental think-tanks such as the Shift Project recommend. It is something that will benefit the bottom line as well as the environment, but that is a big part of what the Circular Economy is all about.

7 tips for running a data centre business during Covid-19

Steve Bowes-Phipps
DCA Advisory Board Member and Senior Data Centre Consultant, PTS Consulting

SENIOR DATA CENTRE Consultant for PTS, I sit on the advisory Board of The DCA (UK Data Centre Trada Association) and sit as Chair on the DCA Special Interest Group for Workforce Development and Capability

I thought it would be helpful to create a brief information video https://youtu.be/DAnsHAZDj_I on seven things you could be doing as a data provider or end user that would perhaps help you in some way during a period of time which we have never experienced before.

1. Maintaining availability

During this pandemic most data centres will be seeing a huge upturn in traffic and demand due to a lot of home working, online courses and streaming services etc.. so my number one thing that comes up time and time again around Datacentre availability or lack of it shall we say " it's human error" and if you want to really produce human error then minimise change; change in at Datacentre can be devastated if it's not managed appropriately and correctly, and even if it is, there's still the opportunity for somebody to make a mistake or to put in place something that impacts a production environment which will take time to rectify , so minimise change and maybe put in place a change freeze for this particular period that's what I would suggest and you may go some way to minimising any change related outages that may result.

2. Understand your business

There is a well tried and tested exercise called "Operational Risk Assessment" the framework firstly looks at understanding what it is you need to provide as a business, then what you have in place operationally to assist you in delivering this, where you might have gaps around some of the controls and measures you would use to double check processes are being followed and finally having strategies and tactics in place to

eliminate or mitigate any of the risks that have come out of this exercise. This exercise can be tremendously formative and enlightening and is really recommend that you do this as it can make a big difference to the way your organisation could cope with situations such as these.

3. Maintaining a safe and healthy working environment

During the Covid19 Corona Virus outbreak, particularly in commercial data centres they tend to have concentrated touch points such as kitchenettes, which unfortunately are where the virus could easily be passed on from one person to another, you may want to consider closing these communal areas down at this particular time, yes there's going to be impact on people so communication is key, explain the reason you are doing this and advising how long this restriction might be in place including washing hands and distancing one's self from others is clearly a sensible move, that way you are preparing those visiting your site so they bring their own food/drink etc if catering or vending machine are no longer available. Whatever it is you do to keep customers and staff informed is a very prudent measure.

4. Reviewing your disaster recovery plans

Now you may or may not have those kinds of plans in place for your own organisation, I hope you do, but the important thing particularly as a provider of services is that you talk to all your vendors and your 3rd parties who are also providing support for you vendor is so parties who also providing support for you because you need to understand what challenges they may be going through, do they themselves have a DR plan in place and do they understand the impact it could have on your business due to a lack of resources on the services they deliver to you. Whether it's the cleaning company, security or plant maintenance/hands and eyes in the data centre it is vital that you understand what they're doing to maintain the services they provide you. If necessary. If you don't feel comfortable this is the case it might be prudent to decide upon an alternative supplier or backup supplier if the worst happens, for example many data centres have contracts with two fuel suppliers, just in case.

5. Communications

Communication with clients and customers is vital, it is really crucial for them to understand what it is you are doing, initially you may wish to do this via email that's obviously a good medium to start with and sometimes clients but I would like a phone call, but I think at the very least you should consider putting up a status page on your customer portal or website and then keep it regularly updated in light of the Covid19 outbreak and associated restrictions on business, travel and social restrictions which appear are going to be in place for quite some time to come.

6. Staff and people

if your job normally involves meeting people and going to businesses, visiting customers and or sites and you know are no longer able to do that, now is the time to look at all those jobs and tasks that you have put off because you've too busy so you can now get everything up-to-date so whether it is working on that project business plan or doing proactive activities to increase brand awareness which will hopefully bring in more business, this could include preparing industry insight, writing articles, blogs and white papers or even improving your skills by taking some online training courses for you or your staff so everyone is ready for the upswing which is inevitably going to happen as we globally come out the other side. Because I know a lot of plans are currently on hold and at some point soon there will be a massive rush to get things done you are going to want to be prepared for that rush to come, and the better you are prepared the more likely you are going to benefit from it and that leads me onto No 7.

7. Only make people redundant as a very last resort

My final point is actually a plea not to fire or make people redundant until you really

have to, and until you have seriously investigated all other options there might be first. See what Government help there might be, talking to suppliers about deferring payment or coming up with a repayment plan or you get paid quicker in order to support your pay pipeline. Whatever it is you do try and keep those people employed as long as you can. There are several good reasons for this; one is "it shows leadership in the industry, it shows that you care about your staff, it shows you value them and that you continue to provide a place where people want to come to work and shows that you are investing in them for the long term through both to good and bad times and not just reacting to short sharp shocks like the one we are currently experiencing.

Secondly as I said in the end in number six there is quite likely going to be a huge amount of work coming down the line and as I have seen in my role as chair of the with the Workforce Development and Capability Special Interest Group for the Data Centre Alliance and I'm constantly meeting with my colleagues and peers and talking about how difficult it is even before the outbreak to get people on board with the right kind of skills but can't experience and do you want to exacerbate the problem for yourselves by getting rid of all those people with great knowledge of your organisation? Of course, you don't, because when your business improves and starts picking up again you what to be there taking advantage and hit the ground running with all the resources you need in place when that starting gun is fired. So hold on to people for as long as you can, get whatever grants you can or loan deferrals there are available and whatever you need because this will subside we will get to the other side and your need those people know what you want to increase your business as well.

Conclusion

So that's just some of my thoughts and I hope there was something in there for you. I'm happy for you to reach out to me, you should be able to find my profile on LinkedIn under PTS Consulting. Please do feel free to do that I'm sure that the Data Centre Alliance will have their own section on this critical time period relating to Covid19 and there will be lots of interesting and informative stuff on there that you want to keep the viewing so look out for that as there will be a lot of people contributing to the information all will have more great insight to how we can make the best of the situation and be positive and I hope that you, all your family, colleagues and business remain healthy.

Flawless performance, flawless facilities

Mike Meyer

Managing Director at Critical Facilities Solutions UK

AS HOME TO mission-critical equipment, it's easy to see why you'd want your facility to be as contaminate-free and well maintained as possible. Yet, even with the necessary procedures in place, contamination still occurs. Everyday activities such as running cooling systems, employees opening and closing doors, installing new equipment – all of these are activities that introduce various levels of contamination.

Maintaining your DC should take a "minimize, regulate and maintain" approach to contamination control and cleaning but how do you find a cleaning schedule and program that is in line with your operational goals?

Hardware manufacturers such as IBM, EMC and Dell recommend you maintain your environment to ISO14644-1:2015 Class 8 utilizing professional data centre cleaners. In fact, failing to do so may void your warranty in instances where preventable airborne contamination was found to be a cause of the device failure. ASHRAE recommends having an annual sub-floor clean and quarterly floor and equipment surface cleaning. Many of the 'standards' and 'recommendations' seemingly contradict one another.

Nevertheless, a clean data centre is essential… and here's why! Airborne contaminants are the unnoticed threat. The trouble with airborne contaminants is that the source (or sources) isn't always easy to identify and harmful buildup can occur over the course of days, months, or even years.

You might not see the source, but airborne and contact-based contaminants build up on equipment. Even solid-state storage mediums can be compromised by buildup on heat sinks, bearings and vents. There's no such thing as an airproof data centre. Therefore, contamination from airborne sources is – for all intents and purposes – unavoidable. Electrostatic dust, corrosive oxides, volatile organic compounds, solvents and other contaminants put equipment at risk. Even seemingly mundane, everyday sources of contamination such as pollen, dust, hair and carpeting fibers can prove to be problematic.

Periodic indoor air quality testing, otherwise known as air particle testing, has long been the best and only, method for ascertaining and confirming compliance to the ISO standard for machine room and data centre air cleanliness. The faults with this method are twofold; firstly, it's a snapshot in time and; secondly, it only measures contaminates that are airborne and not those that have already settled. There have been significant new

advancements in the equipment and methods used to test the air quality and the volume of particulate in the air. At Critical Facilities Solutions we are introducing new methods of testing. While we still use hand-held, snapshot, air particle testing where necessary and relevant we are also installing robust, cost effective alternatives that measure the air quality on a constant or predetermined basis. We've coined the phrase Constant Air Monitoring. The product and system we supply and install can operate as a standalone system or be integrated into any BMS system.

While Continuous Particulate Air Monitors (CPAMs) have been used for years in nuclear facilities to assess airborne particulate radioactivity (APR) and pharmaceutical cleanrooms to measure air particulate (AP) the CPAMs have typically been extremely costly to install in other environments especially when taking the test parameters of the ISO standard and integration into data centre systems into account.

Settled contaminants cause decreased performance and thermal clogging. When airborne or touch contaminants buildup on the surface of equipment, this is known as "settled contamination." These tiny particles make their way onto (and into) delicate equipment, resulting in thermal clogging, data loss and performance bottlenecks due to thermal throttling. Contamination-related failures can even occur with solid-state drives (SSDs). Densely packed racks are more susceptible to contamination. Servers and drives continue to shrink and become even more compact. This is great for reducing floorspace, but it also means equipment is packed in tightly, creating opportunities for settle contaminants to go unnoticed. It's important to note that the more contamination accumulates on equipment and in air filters, the less efficient equipment becomes, leading to performance bottlenecks and wasted energy mostly down to the additional cooling requirements which then lead to further environmental impact.

On to lesser known risks, but for those that have experienced it firsthand, the threat of zinc whiskers – and how they cripple essential equipment – is very real. But, there are several factors that are making this once-rare phenomenon all the more common.

So, what are zinc whiskers and how do you know if your server room or data center is at risk?

Zinc whiskers are microscopic, crystalline slivers of zinc that form through corrosion. Whiskering can originate from any number of sources; flooring panels, ductwork, ceiling hangers, server racks, electrical components and virtually any source galvanised with this brittle metal – even bolts, nuts and washers may exhibit signs of whiskering.

While it is now fairly well understood how whiskering occurs, tracing the source isn't always so easy. For one, these "whiskers" are incredibly light, which means they can easily travel through HVAC systems and subfloor voids.

These metallic, fiber-like "whiskers" are highly conductive and can cross circuit board traces, corrupt data, compromise hardware and cause extensive downtime. PCB boards and other pieces of electronic equipment (servers, SSDs, PCB boards, etc.) are all at risk of being affected by zinc whiskers.

To neutralise the risks associated with zinc whiskers, Critical Facilities Solutions offers a complete solution that includes:

- Sample collection and analysis
- Laboratory testing
- Remediation
- Specialist cleaning
- Testing and consultancy

Getting started with professional cleaning doesn't have to be difficult, if you're new to the concept of hiring specialists to clean your critical facility, a professional data centre cleaner can walk you through the entire process, explaining each step and making recommendations along the way. Since no two facilities are alike, its highly recommended that a thorough inspection and survey be commissioned before you set out to create a service profile and schedule.

Following a consultation, its highly likely that a full deep clean will be recommend as the starting point for any on-going maintenance cleaning (especially if your facility has never received a professional service, or if there has been a lapse in cleaning). A deep clean may include cleaning every square inch of the data hall, equipment surfaces, as well as flooring, stringers, pedestals and the sub-floor voids. These aren't "precautionary steps," but essential parts of preventing recontamination and ensuring your facility is as dust- and contamination-free as possible.

Selecting the best 'starting point' for your Data Centre's maintenance regime can prove challenging. The Data Centre Alliance (DCA), the Data Centre Trade Association has, in consultation with the leading UK Data Centre cleaning authorities and companies, produced and distributed an Anti-Contamination Guide which looks to focus on overall best practice and should be considered a great resource in determining your starting point for any maintenance schedule.

DIGITALISATION WORLD

ONLINE ROUNDTABLE

- Based around a hot topic for your company, this 60-minute recorded, moderated zoom roundtable would be a platform for debate and discussion
- Moderated by the editor Phil Alsop, this could also include 3 speakers
- Questions would be prepared and shared in advance
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Contact: Jackie Cannon
jackie.cannon@angelbc.com

This event would be publicised for 4 weeks through all our mediums including:

- A banner on the Digitalisation World homepage for 8 weeks
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- 4x news pieces which would also appear on the weekly newsletters
- Promoted through our social media platforms for 8 weeks (pre and post event)
- Available as an on-demand asset through all mediums
- All registered attendees' details would be made available to you

Cost: £4995

Cybersecurity: How the physical layer impacts the overall strategy

Jon Barker
Technical Manager, Chatsworth Products Europe

IN A REALITY where data has become the world's most valued asset, privacy and ethical management of data are not only considered priorities but also law. Cybersecurity has taken on a new meaning within every IT budget, as it is the responsibility of the enterprise organisation to ensure their data will be kept safe and uncompromised.

Within the many layers of cybersecurity, the first line of defense being physical security is generally well understood in ICT. However, there are differing opinions when it comes to executing a simple and effective strategy, and how it should be deployed.

How often do enterprise organisations assess the required level of physical security for protecting data? Are they compliant with regulations that address data security? Most importantly, how is their IT team applying physical security and complying with privacy laws within a hybrid data centre architecture, where the data centre, colocation, cloud and edge sites coexist?

Regulatory compliance

All data privacy standards and regulations require physical access control measures for data processing and storage equipment, but with most regulations, it is up to organisations to decide which specific method or technology to use.

In general, compliance to regulations requires a method to:

- Physically secure data processing and storage equipment
- Identify and manage authorised accessors
- Manage access to the physically secure space
- Keep records of access to the physically secure space

In 2018, the urgency for data centre owners to protect data became even more apparent with the introduction of the General Data Protection Regulation (GDPR), applicable to businesses operating within the European Union (EU). GDPR is a strict set of regulations that gives data protection and security policies a new level of priority.

Although GDPR is an EU regulation, any organisation collecting or processing data for individuals within the EU should also have a compliance strategy.

Data Centres will need to be able to demonstrate examples of preventing unauthorised access to electronic communications networks and malicious code distribution and stopping 'denial of service' attacks and damage to computer and electronic communication systems.

Considerations when building an access control system

Majority breaches occur in the network, therefore little attention is paid to physical security. It is important to acknowledge that the intent of data privacy and security regulations is to prevent a data breach. Therefore, preventing a data breach should drive the decisions around physical security.

For an enterprise-owned, single tenant site, for example, room-level security could be perceived as sufficient. But particularly in multitenant data centres (MTDCs) and remote sites, physical access control at the cabinet level simplifies management and prevents unauthorised users to access the servers and switches in which data is stored.

Any enterprises would probably argue that they already comply with privacy regulations. Most data centre cabinets have locked keys. But how can organisations ensure cabinet doors are secure? How do they document access to cabinets? How do they recover keys from users? What is the official response when a key is lost or stolen?

Electronic lock and access control systems automate monitoring,

documenting and control of access and allow fast reprogramming if access rights change or if a credential is lost or stolen. These types of control systems support three types of keys:

1. Something a person has – Access card

- Assign and change credentials quickly without the need for changing the locks, but an access card can still be lost or stolen

2. Something a person knows – Keypad passwords

- A password is more difficult to steal, but it can be guessed or reprogrammed

3. Something a person is – Biometrics

- Biometric authentication is uniquely associated with an individual digital print and is only allowed for rare instances of fraud

A comprehensive electronic access control solution can play a vital role in a data centres user access management plan. It is important to consider the levels of security for each type of access: single-factor or multi-factor authentication. Dual and multi-factor systems may require an upgrade at the electronic lock to include an additional reader.

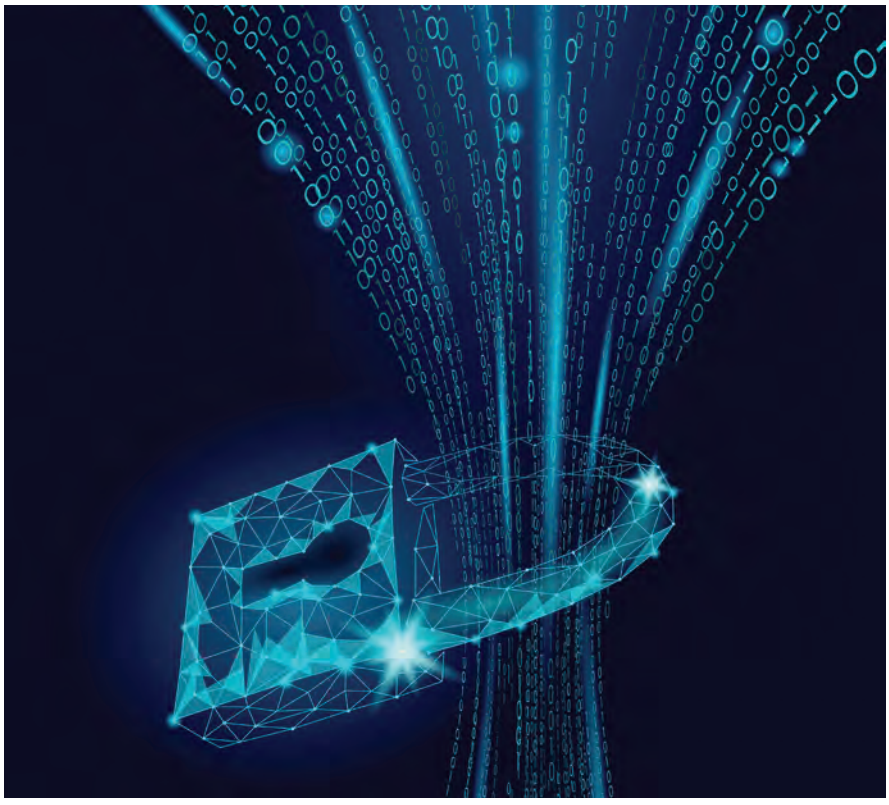
Essential considerations for rack-level electronic lock solution

When selecting a rack-level electronic lock solution, there are essential capabilities to consider:

Electronic Locks

Electronic locks secure the doors on cabinets, sense access attempts and indicate door latch (lock) opened or closed condition. These are typically swing handle with an integrated solenoid that operates the latch to opened or closed condition, a proximity sensor that indicates condition of the latch opened or closed, and an access card reader that senses and reads values from presented keys. The lock also carries a mechanical key override to handle door openings during a power outage.

Access card readers are required to be compatible with the card types provided to individuals within an organisation. Types of access cards can vary from 125 kHz proximity cards to simple 13.5 MHz smart cards, to next-generation smart cards with one-time passwords. With access card technologies changing very rapidly, the ideal scenario would be for the swing handle and the reader to be separate integrated modules. Some models may also include an integrated keypad or biometric reader.



Single-Factor or Multi-Factor Authentication

Multiple levels of authentication may be preferred, depending on the level of security required. Some electronic locks may include an additional keypad for a unique PIN entry. More advanced solutions may include a biometric reader. Biometric authentication methods require consideration for privacy laws. It is recommended that it should be used alongside an RFID card, the biometric imprint is stored on an individual's badge rather than a centralised database.

Door Sensors

As well as collecting input and monitoring the cabinet lock status, an electronic locking solution for needs to monitor the status of the multiple cabinet doors themselves. In the event a door is opened, a warning notification should be triggered immediately, followed by additional warnings if the door is left open for an extended period.

Wiring and Network Connections

There are three types of network connections: The first is through rack intelligent power distribution units (PDUs). The second via a separate networked controller module. The third in which the locks are connected to a building's security access panel.

In the first two scenarios the locks are managed by IT through a data centre infrastructure management (DCIM) software solution. The latter is managed through the building security system, which is also used to manage access within the entire building.

Networking Through PDUs

Advanced rack PDUs can now integrate with environmental monitoring sensors and access control. This mends the need for power management, environmental monitoring and access control, as all three can be handled at once. This is done via a straightforward, easy-to-use web interface, all networked under one IP address.

With an integrated PDU system, there is no need for a dedicated controller for the electronic locks. The locks also get powered up through auxiliary ports on the PDU. Operators can monitor, manage and authorise each cabinet access attempt wherever the cabinet is situated through remote management to the PDU,

which is already part of the data centre cabinet ecosystem. This significantly reduces the initial cost of deployment of cabinet-level locks as well as ongoing operating costs. Using this integrated, intuitive interface, data centre operators are easily able to provide log reports for critical audit trails for regulatory compliance. It also reduces the need therefore cost for wiring the electronic access systems to security panels.

Card IDs can be stored within the PDU web interface. The PDU firmware should support either a standalone list of authorised users or integrate with third-party databases that control user access and rights management. For centralised authentication, either enterprise authentication services (i.e. those supporting networking protocols RADIUS, LDAP, Active Directory) or a DCIM solution can be used.

Networking Through a Separate Controller Module

Electronic locks can also be managed through a dedicated controller module located in every cabinet. While this does increase the initial hardware cost, ongoing operational costs can still be significantly reduced by networking several locks through advanced IP consolidation technology. The PDUs that support IP consolidation allow multiple PDUs to connect through a single physical network connection, IP address and interface, thereby reducing network overhead to monitor at the rack level. For example, some IP consolidation solutions allow up to 32 controllers to be networked under only one IP address with an alternate second connection for failover capability. This means MTDCs and colocation providers do not have to pass on unnecessary networking costs to their tenants.

Like PDU-integrated system, authentication and management could be provided through interfaces that IT organisations already use. For the widest range of compatibility and security for the network, ensure that the PDU or the dedicated controller supports the IPv4 and IPv6 protocols for TCP/IP addressing with static or dynamic address assignments. Simple network management protocol (SNMP) v1, v2c and v3 protocols should be used for third-party DCIM software integration.

The web interface should support HTTP or HTTPS sessions with definable ports. Network connections should support encryption and certificates. The email server connection should be outbound only with transport layer security (TLS) and definable ports. For ease of maintenance, the controller module should support bulk configuration and firmware upgrades. The firmware should log every system change.

Networking Through Security Access Panels

With this approach, cabinet-level electronic locks are connected to a Wiegand technology-based security access panel that in turn communicates with a building access control solution.

The security panels provide power to the locks. The advantage of this approach is that it leverages the same access control system that is used for campus security. Given the high number of cabinets on a data centre floor, this solution requires installation of additional access control panels for connecting the handles on the cabinets. It is powered and controlled from that system and that system's software.

Conclusion

As greater amounts of confidential data get stored in the cloud, physical access control at the cabinet level needs to become a norm rather than an exception. A myriad of solutions that vary based on the level of security, management modes and budgets are available for organisations to consider.

Technology media company International Data Group (IDG) predicts 50 ZB of data will be created world-wide this year. It is safe to say that enterprise businesses that inspire trust and know how to ethically address risk, security, and compliance will excel in a big way.

The importance of choosing the right battery for Uninterruptible Power Supplies

Mark Coughlin
Applications Manager for Reserve Power at EnerSys®

TODAY'S DATA CENTRES depend on uninterruptible power supplies (UPS) to provide clean, continuous power throughout the facility's entire operational life. While the mains supply is available, the UPS protects the data centre's sensitive information and communication technology (ICT) equipment from electrical noise and any other power aberrations that may appear on the incoming power feed. If the supply fails, then the UPS battery must take over instantly and use its stored energy to support the load until either the mains is restored, or a generator can be started, or the data centre systems can be shut down safely.

A UPS battery's ability to store energy reliably and efficiently during normal operation, making it immediately

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available to the load during a mains failure, is critical to data centre security. Accordingly, in this article, Mark Coughlin, Applications Manager for Reserve Power at EnerSys® reviews the key battery technologies currently available, to inform commercial and technical specifiers responsible for battery selection.

The article starts by looking at how data centre evolution is affecting the demands placed on batteries. It then compares Lead-Acid, the pre-dominant battery chemistry used within data centres, with alternative technologies, in particular Lithium-ion (Li-ion), which has been generated rising interest in recent years. Finally, it examines why data centre operators should consider advanced Thin Plate Pure Lead (TPPL) technology to optimise the performance of their UPS and power systems.

The evolving data centre landscape

Data centres today experience a rising incidence of power outages and grid fluctuations caused by increased urbanisation and demand. Meanwhile, their workload is expanding, with a move to multi-user hosting services and larger data storage capacity requirements. These factors increase pressure for 'best in class' technologies and reliable power.

UPS batteries are also directly impacted by reduced autonomy times, now typically between 30 seconds and 5 minutes, compared with historical averages of around 15 minutes. This is because of the shorter times needed to start up generators and switch loads. Fast recharge times are also desirable, allowing batteries to be recharged quickly in order to be able to support further power outages.

Energy efficiency has become an overarching concern for all data centres, not just because of the financial impact of large-scale operation and rising energy costs, but also due to pressure from stakeholders – and legislation – to pursue effective carbon footprint reduction policies.

Concerns about energy costs and grid power availability are driving growing interest in using UPS battery assets for energy storage applications, as a way to generate further revenue. In Firm Frequency Response applications, for example, UK-based data centres could provide battery energy back to the National Grid on demand.. Alternatively, the batteries could be used for peak shaving, reducing data centre energy costs by supporting loads when electricity cost is high and then recharge the battery when low-cost electricity supply is available.

Such strategies can bring significant cost savings, and generate money when supplying energy back to the grid. However, they demand longer battery autonomies than the five minutes typically needed for UPS backup. Currently, there are relatively few active sites deploying this strategy. Nevertheless, manufacturers such as EnerSys® have conducted trials with batteries that can support these applications.

Battery technologies and trends

Battery chemistries currently available for UPS backup include Lead-Acid, Lithium-ion (Li-ion) and Nickel-Cadmium. There are also non-battery technologies like flywheels and Super-Capacitors. However, this article focuses on the two types that currently dominate the data centre industry: Lead-Acid, which represent over 90 per cent of the UPS market share, and Li-ion, which is attracting increasing interest due to its purported performance benefits and high visibility through its use in electric vehicles.

Li-ion is attracting interest through being attributed with performance features superior to traditional Lead-Acid VRLA batteries, which are typically either gel or absorbent glass mat (AGM) designs. Compared to traditional VRLA equivalents, Li-ion offers a high cycle life, together with a significant size and weight reduction. Li-ion batteries also have high charge efficiency, with excellent partial state of charge tolerance – in fact, partial charge is preferred for long cycle life and operation in float conditions at full state of charge is avoided. The self-discharge rate of Li-ion is also low, which results in prolonged shelf life when in storage. Finally, it has good high and low temperature performance, and no gas emissions.

However, Li-ion's comparison with traditional VRLA reveals some challenges along with its benefits. Accordingly, we show how TPPL technology, as an advanced form of Lead-Acid chemistry, offers a number of advantages over traditional VRLA batteries. Despite historical cost reductions, Li-ion pricing remains a barrier for many users. With pricing depending on many factors including purchase volumes and the exact chemistry used, Li-ion is currently significantly more expensive than Lead-Acid. Furthermore, although space-saving may be important within data centres, weight reduction, which Li-ion batteries offer, is seldom critical. Similarly, the high cycling capability of Li-ion isn't a driving factor for selection within UPS

applications, where batteries are mostly floating at near full state of charge.

While considered a safe technology, any Li-ion solution, unlike Lead-Acid, must include a battery management system (BMS) to ensure safe charging and discharging. This increases complexity, and requires users to have a thorough understanding of Li-ion technology. However, the BMS provides built-in diagnostics, which identify most problems and allow minimal maintenance.

Additionally, consideration must be given to the MTBF (Mean Time Before Failure) of the electronic components factored into Li-ion calendar lifetime calculations. Lifetimes of 15 years are claimed, but service life is not proven in the field. By comparison, advanced TPPL, with 12+ years design life, provides eight to 10 years' service life, while traditional VRLA 10-year design life batteries typically provide five to six years' service life.

Charging is another important consideration. Firstly, to fast-charge Li-ion, higher charging capacity, with increased cost, may be required. Also, in many cases the charging architecture would need to be replaced or changed to support different Li-ion battery charger voltages, so two different UPS rectifier types would be required across a data centre attempting to deploy both Li-ion and Lead-Acid batteries.

Other factors, while not immediately specific to the data centre environment, should also be considered when selecting a battery technology. During transportation, Li-ion faces legislative shipping restrictions, while Lead-Acid batteries, including AGM and TPPL, is classified as non-hazardous for all transportation modes. Then, at end-of-life, Lead-Acid has an inherent value, and is about 95 per cent recyclable by a very well-established network of smelters; this possibility, however, is not mature for Li-ion.

TPPL: Optimised performance without the drawbacks

Above, we have seen why Li-ion, while attracting increasing attention, has been slow to penetrate to data centre market. On-going development driven by the powerful automotive sector may change this, but advanced TPPL technology

offers data centre managers the best of both chemistries.

As a Lead-Acid based battery technology, TPPL is reliable, well-proven, and easy to transport, handle and recycle. Crucially, advanced TPPL technology significantly improves energy efficiency, by providing up to 43 per cent energy reduction compared with traditional VRLA batteries through reducing float current requirements. Further energy savings accrue as it can operate, within warranty, at elevated temperatures, reducing air-conditioning requirements.

Meanwhile, advanced TPPL battery technology reduces data centre vulnerability to multiple mains blackouts, through very short recharge times and time to repeat duty. For example, with 0.4C10 A charging current using fast charge methodology, TPPL can be fully recharged, following a one-minute discharge to 1.6 Vpc, in 2½ hours, and ready to repeat duty in 22 minutes.

Battery replacement costs are also reduced through low internal corrosion rates, yielding a service life 25 per cent longer than for traditional VRLA. Additionally, storage life is increased from six to 24 months due to low self-discharge rates.

Advanced TPPL technology is used today in many demanding critical applications. Data centre users can access TPPL through DataSafe® XE batteries, which are specifically designed for UPS applications. They support autonomies of under five minutes, while offering all the above TPPL features.

What of the future?

Lead-Acid technology is expected to dominate the market for at least the next few years, although enquiries and niche projects suitable for Li-ion will continue to grow. In particular, applications requiring high cycling will be seeking advanced TPPL or Li-ion solutions.

Depending on the application, Li-ion could be the preferred battery type. Nevertheless, before opting for Li-ion as the technology for a particular application, a full consideration of the requirements should be undertaken.

The assessment should reflect the Total Cost of Ownership, with the benefits and challenges of Li-ion compared against other available technologies, including TPPL.

Irrespective of the technology chosen, battery monitoring systems will become increasingly popular, due to the battery condition visibility and opportunities for predictive maintenance that they provide. This will also bring UPS applications into the increasingly pervasive Internet of Things (IoT) environment, making them visible as components of the larger data centre infrastructure.

For further information on UPS batteries, specialists can be contacted via the website www.enersysdatacentres.com