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MODERN ENTERPRISE IT - FROM THE EDGE TO THE CORE TO THE CLOUD

ISSUE VI 2024

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VIEWPOINT By Phil Alsop, Editor

Who knew – AI needs plenty of power?

The The recent news that a hyperscaler's carbon emissions have risen significantly over the past few years, thanks in large part due to the building of Al-ready infrastructure, comes as no surprise. What is perhaps surprising is that, thus far, the data centre industry has not pressed the Al panic button. Good progress has been made when it comes to developing sustainable data centres – but it is clear that such progress may well be reversed as the Al explosion hits these facilities – mainly brand new ones built specifically for Al.

Looking at the bigger picture, it would seem that the digital v sustainable argument has yet to play out. This power-hungry AI news will lend strength to the position which holds that a truly digital world cannot also be a truly sustainable one. Ultimately, the decision as to which of these two apparently incompatible objectives will win out is one for the politicians. And followers of the increasingly volatile political landscape across the globe will know that there is currently significant push back on the idea that Net Zero needs to happen fast and irreversibly.

That's in part because sustainability is being 'sold' by climate change opponents as incredibly expensive and disruptive. The truth is that true sustainability (doing less, consuming less) almost certainly costs individuals very little – but it does require a complete re-think of the way in which economies operate – and there's plenty of pain for the capitalists as whole industries and human activities are all but phased out (no one needs to travel far for a holiday, for example, but there goes the tourism industry...).

It's difficult to imagine such a world, where local and sustainable wins out, but anything short of such a radical re-think of every aspect of our lives is some kind of a compromise in favour of digitalisation. And who is to say that such a compromise is not possible – significantly less consumerism, but not a complete wipeout of all that



we hold important as of now. Then again, what many of us regard as highly cherished freedoms (to travel as we want, to consume what we want, how and when we want) are almost certainly somebody else's freedoms being taken away (as the planet heats up and floods, famines and other extreme weather conditions ruin millions of lives).

I am not sure that even Solomon with all his reputed wisdom would come up with an answer that keeps everyone happy. For the IT industry, it will be fascinating to see what happens as more and more individuals across the globe begin to understand the true cost of AI.

There's no disguising the AI power bill, and it could well be that the AI debate will move on from ethics and bias concerns to a more simple discussion as to the societal benefits of new, intelligent applications versus their considerable carbon footprints.

I would say it's time for me to head off to a tiny island where I can enjoy a simple, stress-free life, and not have to worry about the huge challenges we all face trying to resolve the digital versus sustainable dilemma, but there's every chance that the one I choose will be under water in the near future!

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INDUSTRY NEWS

CIOs must prepare for the fourth industrial revolution

The emerging impact of AI, combatting more sophisticated cyber threats and improving sustainability are the top priorities for CIOs.

HOT ON THE HEELS of the release of Chat GPT-40 and the Google IO conference where lots of AI tools were on show, a recent study has shown that Chief Information Officers (CIOs) are investing in AI tools to ensure they position themselves front and centre in the world's fourth industrial revolution.

Results in the 2024 CIO Report from global technology service provider, Logicalis UK&I, revealed that 85% of CIOs are earmarking budgets solely for AI development and implementation. Undoubtedly, this needs to be a strategic objective for many senior leaders in 2024 as 87% of CIOs reported a substantial demand for AI technology from across their organisations.

Before the calls of 'the robots are taking over' are made, it is worth noting that there is an air of caution amongst many CIOs. 72% said that they are apprehensive about the challenges of regulating AI use internally and 64% of business leaders expressed worries about AI threatening their core business propositions. Neil Eke, CEO at Logicalis UK&I says, "Our survey shows that CIOs are unequivocally embracing the disruption. Compared to our 2017 report when CIOs were mainly focused on keeping the lights on, their remit in 2024 is far more strategic, forwardthinking, and business-driven. Digital transformation is being replaced with Al innovation as more investment goes towards emerging technologies. With Al becoming the top priority for CIOs in 2024, it's not surprising that many are actively seeking opportunities to incorporate such capabilities into their companies."

The Logicalis CIO Report surveys the views of 1000 CIOs across the globe and has tracked the strategic influence of the CIO for over a decade. During



that time technology leaders have moved from the basement to the boardroom. Now, in 2024, CIOs have to juggle major disruptive forces. The rise of AI and advancing security threats, global economic uncertainty and the mounting need for climate action, are upending the status quo and bringing a whole new set of leadership challenges.

Cybersecurity findings from the CIO Report include:

- 83% reported experiencing a cyber hack in the last year
- Less than half (43%) felt their business was fully equipped to handle another major security breach
- Malware and ransomware (41%) are the most significant risks to organisations over the next 12 months, with a similar portion reporting data breaches (36%) and phishing attacks (35%) as the two other most significant risks.

It is staggering that 83% of CIOs reported experiencing a cyber hack in the last year and, even more concerning is that almost all of those surveyed experienced business damage as a consequence. Mike Fry, Security and Cloud Business Unit Director at Logicalis UK&I explains, "Everyone now has easy access to sophisticated AI models, including cybercriminals, which could explain why so many CIOs reported they've experienced a cyber hack recently. There is also a skills gap in the IT industry which is particularly pronounced in the cybersecurity sector, leading to fatigued and overwhelmed IT teams trying to tackle more incidents and alerts."

Fry continues, "As we enter the era of widespread AI use, the use of AI by threat actors will be one of the single biggest threats we face in Security. However, if used correctly, AI also represents the best chance we have at defence. As a result, organisations should be looking to deploy security systems that leverage AI technology to remain one step ahead. By integrating AI into your Security Operations Centre and deploying AI-enhanced threat detection the technology can help tip the scales in our favour when it really counts."

As if getting to grips with emerging Al and combatting sophisticated cyber hacks wasn't enough, CIOs are also facing growing pressures to limit the environmental impact of their organisations on top of the traditional demands to control costs.

Sustainability findings from the CIO Report include:

- 92% of CIOs are increasing investment in environmental sustainability initiatives
- 89% of CIOs have clear targets to reduce carbon emissions from IT
- 96% of CIOs say their function has a voice in the company's overall sustainability planning and targetsetting

To identify potential areas for improvement, CIOs have to know where to look and the data deluge continues to make this a challenge. 80% of technology leaders struggle to analyse performance across their digital footprint. This lack of visibility is not only a time drain, but a barrier to finding opportunities to bring down costs, enhance service and deliver maximum value back to the business.

Inadequate or outdated technology is holding back innovation

New report from NTT DATA highlights importance of robust infrastructure lifecycle management to improve business continuity and reduce operational risk as 94% of C-suite executives believe legacy infrastructure is greatly affecting business agility.

NTT DATA has found that 80% of organizations agree that inadequate or outdated technology is holding back organizational progress and innovation efforts. In fact, 94% of C-suite executives believe legacy infrastructure is greatly hindering their business agility.

These findings come from NTT DATA's inaugural Lifecycle Management Report. The report, which leverages 25 years of data-led insights from NTT DATA, explores the challenges and opportunities that exist for organizations as they navigate infrastructure lifecycle management. The research was conducted over 2022 and 2023, gathering data from over 248 million active assets across 130 countries and supported with responses from up to 1400 senior technology decision makers.

Lifecycle management is a critical enabler of business success. Unfortunately, rapid modernization, and the proliferation of technology consumption models, coupled with an increasingly complicated and fragmented supplier ecosystem, make it difficult for many organizations to adequately maintain their technology infrastructure in a way that fosters business agility and innovation.

Compounding issues, the report finds that more than two thirds (69%) of currently active hardware (with scheduled last day of support) will no longer be supported by 2027. According to the report, just 51% of enterprises have fully aligned their technology approach to their business strategy needs, while 71% of organizations say their network assets are mostly ageing or obsolete.

Unfortunately, lifecycle management can also have an even more direct impact on operations. Misaligned lifecycle patterns can result in inappropriate coverage levels, laborintensive renewals, extended incident resolution times, security breaches, and even costly license violations and compliance issues.

The Lifecycle Management Report offers timely, actionable insight to help IT leaders mitigate these risks, while maximizing the value of their hardware and the software that runs on it, including:

- Advice for developing a holistic view of technology assets that allows for the rationalization of potentially misaligned lifecycles.
- Support for standardizing procurement practices and streamlining an organization's multivendor environment as the ecosystem becomes increasingly fragmented.
- Guidance for optimizing cost while improving service provision, both internally and for external stakeholders and customers.
- A greater understanding of the sustainability benefits improved lifecycle management procedures can deliver.

Gary Middleton, Vice President of Networking GTM at NTT DATA, Inc., said: "Infrastructure lifecycles are a critical part of the IT management process. They represent an opportunity and a challenge for leadership, as effective lifecycles can result in huge business benefits – from increased efficiency to fostering greater innovation. However, inefficient lifecycle management can equally be a meaningful operational blocker, posing numerous risks to security and business continuity."

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It is imperative that Digitalisation World magazine remains a timely resource for this industry, so we are especially interested in highlighting very recent work.



INDUSTRY NEWS

Cost is biggest barrier to democratisation of AI

Consumers and small businesses held back from creating AI systems by cost, complexity and skills.

ALMOST TWO THIRDS (61%) of business decision-makers believe that large enterprises will be the primary creators of Al in future, with few believing that consumers (18%) or startups (28%) will have the capability and power to develop new systems. According to the research, the main barriers to Al software creation include cost (46%), technical skills (39%) and ethical concerns (31%), demonstrating a clear need for upskilling, educational resources and the availability of costeffective infrastructure to make Al creation accessible for all.

"Al is a tremendous force for good, but to make sure that it benefits us all, we must democratise access," said Emma Dennard, VP Northern Europe, OVHcloud. "We need to create a future where everyone understands the possibilities and challenges that Al brings, where technical skills are taught to all, and to develop systems that make the creation of Al systems as simple as putting a jigsaw together."

business decision makers, found that just under half (46%) believed that both businesses and consumers would be the primary users of AI, while over a third (36%) believed that businesses alone would be the main users.

"Everyone is going to benefit from Al in future," continued Dennard. "Al and generative Al have a lot to offer, from helping with everyday tasks and automating routine jobs in the office to improving customer service and analysing complex data. But with Al still in its infancy, it's critical that we take steps today to create the industry we want tomorrow."

The research, which polled 500 senior

Although the research indicated

that Al is unlikely to be created by consumers in future, 38% of the study did believe that Al had the power to make technology accessible to all, highlighting the technology's ability to democratise itself. However, even business decision makers had concerns about making Al work for their organisations, as 31% of those in large organisations (over 500 employees) found that making a business case for Al was a challenge, with 32% experiencing governance issues.

"Consumers and organisations alike face all kinds of challenges in creating and using new AI systems," concluded Dennard. "The important thing is that we build an industry that will enable democratised access to systems and infrastructure, as well as teaching the skills and discussing the ethical challenges and responsibility that comes with these applications. Otherwise, we run the risk of leaving these powerful tools in the hands of a few very large enterprises, rather than having a truly democratic, fair and open AI future."

62% of companies lack AI skills

SOFTWAREONE has released further findings from its Cloud Skills Report, highlighting the need to bridge the Human-Machine divide. The biggest pain point for companies in their digital transformation efforts is ensuring employee skills growth matches the rapid rate of innovation. Nearly twothirds (62%) report currently having inadequate skills to leverage AI and 41% of organisations are struggling to find AI skilled employees.

The research underscores a pressing reality: prioritising close collaboration between human workers and advanced technologies is paramount amidst a widening cloud skills gap and apprehension around Al. This symbiotic relationship is set to redefine organisational dynamics, with 97% of organisations planning to prioritise upskilling their workforce according to the research.

The cloud skills shortage has increased the individual workloads of 62% of respondents, and led to significant repercussions, including burnout and high turnover rates within departments. Notably, almost a quarter of global IT managers (23%) are contemplating quitting due to the skills gap, while a staggering 84% of companies perceive IT retention issues as a significant challenge. But these retention issues are compounded by conflicts within teams. 34% of respondents said that the cloud skills gap has caused tension between themselves and their boss, while 42% say it has caused tension within the team. And one in five (22%) of respondents said they don't feel comfortable asking for additional training to advance their skills.

"Rapid advancements in AI and generative AI offer exciting prospects for companies worldwide, but organisations are sitting on a ticking talent time bomb if they don't upskill and retrain their workforces now to fulfil the potential of AI," said Brian Duffy, CEO at SoftwareOne.

Businesses spend on artificial intelligence tools rockets in first quarter of 2024

Soldo's Spring Spend Index reveals spend on AI is up 449% compared to a year ago – with 63% of all AI spend now on Chat GPT.

SOLDO'S Spring Spend Index, launched recentlyy, reveals the extent to which UK businesses are rushing to invest in Al in a bid to usher in a new era of technology driven productivity.

Based on Soldo's data, since Q1 2023, AI investment has surged an astonishing 2.75x with companies spending 449% more on AI compared to the same period last year.

In its most revealing study yet, the Spring Index – a quarterly study of company expenditure habits in more than 18,000 organisations using Soldo - reveals business spend at the start of the year is up a healthy 8% YoY, largely driven by investments in technology as businesses look at ways for reducing the burden on overstretched employees.

Which AI tools are businesses investing in

OpenAl's ChatGPT dominates the market, accounting for 63% of overall Al spend while Midjourney leads image generation with 12%. Otter.ai's transcription services take 5% of the spend, followed closely by Fireflies. ai which transcribes and summarises meetings and provides vocal analysis to quantify meeting outcomes and sentiment. The remaining 17% is split between around 80 different Al services.

Additionally, the study highlights that marketing departments are taking the lead in AI spending with content creation and production-related activity accounting for almost half of AI suppliers alone.

While on the surface this suggests an increasing awareness of the many uses of AI, this growth is indicative of a broader trend – one that reflects the strategic imperative for businesses



to remain competitive in an evolving economic and business landscape. "Adopting AI can give employees a much-needed productivity boost, which unlocks crucial competitive edge for businesses. However, as businesses continue invest in Al tools, the productivity gains from the technology will soon be the norm, not a differentiator." comments Brandon Till, Head of Business Solutions, at Soldo. "As businesses open up to using Al tools, the key to it being used effectively will be finding the sweet spot between control and flexibility. Innovation is happening fast, from all

over the business, and employees want to be empowered to explore and create more efficient ways to work. They cannot afford to waste time getting stuck in long procurement processes.

That's where finance comes in. They can ensure employees have access to the AI resources they need, while at the same time keeping a close eye on spending and make sure the business is getting its money's worth. Finance teams are often the watchdog for data compliance, so they have to lead the charge to empower employees responsibly."

While on the surface this suggests an increasing awareness of the many uses of AI, this growth is indicative of a broader trend – one that reflects the strategic imperative for businesses to remain competitive in an evolving economic and business landscape

INDUSTRY NEWS

80% of knowledge workers knowingly make business decisions based on unreliable information

AMPLYFI research uncovers discrepancies in determining content credibility, leaving businesses at risk of misplaced confidence.

THE VAST MAJORITY (80%) of knowledge workers admit to making business decisions based on information they aren't entirely sure about. That's according to a study from AI-powered market intelligence platform AMPLYFI.

Knowledge workers are reliant on search engines, social media and thirdparty research to make critical business decisions. Validating this wide variety of content is considered the number one priority (54%) as it forms the basis of this decision making.

Despite this, 88% say they only discover information is inaccurate after putting plans in place.

AMPLYFI commissioned independent research house Censuswide to poll 100 decision makers within businesses of at least 250 people, with the aim to benchmark how selective knowledge workers are about the content they read and trust.

Paul Teather, AMPLYFI's CEO, commented: "Trustworthy content is in danger of being an echo chamber of what lots of peers are seeing and thinking. A truly original and independent view can only be taken with a wider appraisal of the available content. Even if some of the insight makes for uncomfortable reading." The study found that 93% of knowledge workers are confident that they are accessing the most relevant resources available to them. However, only 6% frequently go past the first page on a Google search to find relevant results, and only two in 10 (21%) choose to explore new channels.

64% of knowledge workers fear that navigating the increasing volume of content around their industry is becoming unsustainable – which will



only get worse as the datasphere grows.

At the same time, trust in technology is at an all-time high, with 86% of knowledge workers deeming Al platforms to be altogether trustworthy. However, the Al industry is fighting a bigger battle, as over three quarters of respondents (78%) believe that popular Generative Al models like ChatGPT are actually eroding people's trust in Al. Teather added: "These Al tools are chasing the broadest possible user base and are essentially B2C tools that can also be used by organisations.

64% of knowledge workers fear that navigating the increasing volume of content around their industry is becoming unsustainable – which will only get worse as the datasphere grows However, this use has to be carefully managed so as not to undermine the truly transformative potential of the technology when applied to a specific use case."

Survey respondents reveal that primary benefits of AI for market intelligence to be faster data analysis (44%), making it easier to identify market opportunities (38%) and improved accuracy of research (38%).

Over three quarters (81%) state that generative AI provides accurate and relevant intelligence and insight, and the most common measure of trust is that it has been externally validated and fact checked (37%), which trustworthy AI can offer.

Teather concludes: "In every organisation, knowledge workers are under pressure to become more effective, to take shortcuts, to "hack" processes. But along the way, we have to make sure that these steps do not undermine the very things they sought to benefit. We believe that Al unlocks huge potential to solve both a volume and quality challenge in the content space."

The AI industry to hit almost \$830 billion by 2030

The global AI industry has grown tremendously over the past years, and nothing can stop its growth. In 2024, the entire market is set to reach 315 million users and a \$184 billion value, 35% more than last year. However, that's nothing compared to the growth projections in the following years, which recently became even more optimistic.

ACCORDING to data presented by Stocklytics.com, the Al industry is expected to hit almost \$830 billion value by 2030, or nearly \$90 billion more than the earlier forecast. Natural Language Processing and Al Robotics to See the Biggest Growth Difference

Over the past four years, artificial intelligence has become a synonym for growth. Al companies led the stock price rally and became the new shining objects for VC investors.

At the same time, Al technologies have reached hundreds of millions of users worldwide, both in the private and corporate sectors, helping them to improve efficiency and decision-making and gain a competitive edge.

Four years of unprecedented growth have helped the AI industry to practically double, with its valuation jumping from \$93 billion in 2020 to \$194 billion this year.

According to Statista Market Insights, the following years bring just as

impressive growth, much bigger than expected earlier. Last year, Statista forecasted the global AI market to hit a \$738.7 billion value by 2030. However, 2024 market projections show higher figures, with the market value rising to \$826.7 billion, or almost \$90 billion more than the earlier forecast.

Machine learning will remain the market's largest and highest-grossing segment, reaching a \$503 billion value by the end of a decade, still \$25 billion less than expected earlier.

Computer vision and autonomous and sensor technology segments also got lower expected market valuations. By 2030, the computer vision market is set to grow by 87% and hit almost \$47 billion value, down from close to \$51 billion in earlier forecasts. The autonomous and sensor technology market will see a similar decline, with a forecasted market value falling from \$59.5 billion to \$55.2 billion in 2030.

On the other hand, market projections for natural language processing and AI robotics have become quite optimistic.



Statista expects AI robotics to reach a value of \$64.3 billion by 2030, almost double the earlier forecast.

The natural language processing segment will see even bigger growth, reaching a 147% higher valuation of \$156 billion by the end of a decade. Almost 730 Million People to Use Al Tools by the End of a Decade.

Growing investments in AI research and development, increasing use of AI in consumer-facing applications, and a surging demand for automation and optimisation across industries will help the AI market reach more users than ever in the following years.



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INDUSTRY NEWS

Enterprises carry on with AI despite security and compliance concerns

F5 has released a new report that provides a unique view into the current state of enterprise AI adoption. F5's 2024 State of AI Application Strategy Report reveals that while 75% of enterprises are implementing AI, 72% report significant data quality issues and an inability to scale data practices.

"AI IS A DISRUPTIVE FORCE, enabling companies to create innovative and unparalleled digital experiences. However, the practicalities of implementing AI are incredibly complex, and without a proper and secure approach, it can significantly heighten an organization's risk posture," said Kunal Anand, EVP and CTO at F5. "Our report highlights a concerning trend: many enterprises, in their eagerness to harness AI, overlook the need for a solid foundation. This oversight not only diminishes the effectiveness of their AI solutions but also exposes them to a multitude of security threats."

As enterprises build out a new stack to support the widening array of Al-powered digital services, the study highlights challenges they face across the infrastructure, data, model, application services, and application layers that must be overcome for widespread scalable adoption.

The promise and reality of generative AI

Organizations are enthusiastic about the prospects of generative Al's business impacts. Respondents named it the most exciting technology trend of 2024. However, only 24% of organizations say they have implemented generative AI at scale.

Although the use of generative Al is on the rise, the most common use cases often serve less strategic functions. The most common use cases that respondents say they've already deployed include copilots and other employee productivity tools (in use by 40% of respondents) and customer service tools such as chatbots (36%). Tools for workflow automation (36%) were named the highest priority Al use case, however.

Roadblocks to scaling AI in infrastructure and data layers

As enterprise leaders examine challenges to deploying Al-based applications at scale, they cite three main concerns encountered at the infrastructure layer:

- 62% cite the cost of compute as a major concern to scaling AI
- 57% cite model security as a primary concern. To address this, enterprise leaders expect to spend 44% more on security over the next few years



as they scale deployments

 More than half of respondents (55%) cite performance across all aspects of the model as a concern

At the data layer, data maturity is a more immediate and potentially bigger challenge impacting the widespread implementation of AI:

- 72% of study respondents cite data quality and an inability to scale data practices as the top hurdles to scaling AI
- 53% cite the lack of AI and data skillsets as a major impediment
- Although 53% of enterprises state that they have a defined data strategy in place, over 77% of organizations surveyed state they lack a single source of truth for their data

Cybersecurity remains a key concern and consideration

According to the study, cybersecurity is a principal concern for those tasked with delivering AI services. Factors such as AI-powered attacks, data privacy, data leakage, and increased liability rank among the top AI security concerns.

When asked how they plan to defend against these threats to secure Al implementations (or are already doing so), respondents are focused on app services such as API security, monitoring, and DDoS and bot protection:

- 42% state they are using or planning on using API security solutions to safeguard data as it traverses AI training models
- 41% use or plan to use monitoring tools for visibility into AI app usage
- 39% use or plan to use DDoS protection for Al models
- 38% use or plan to use bot protection for AI models.



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69% of CEOs view sustainability as a growth opportunity

As CEOs reset their long-term strategies, environmental sustainability remains one of the leading factors that will frame competition. Despite much corporate greenwash, recent economic conditions could have triggered a reversion to environmental, social and governance (ESG) cynicism and a refocus on profit at all costs. However, the overall commitment of CEOs appears unwavering.

BY KRISTIN MOYER, DISTINGUISHED VP ANALYST AT GARTNER

THE 2024 Gartner CEO and Senior Business Executive Survey was conducted from July to December 2023 among over 400 CEOs and other senior business executives in North America, Europe, Asia/Pacific, Latin America, the Middle East and South Africa, across different industries, revenue and company sizes.

"Sustainability consistently remains a top 10 business priority, surpassing even productivity and efficiency this year," said Moyer. "Leaders and investors know environmentally cavalier corporate behavior is a mid- to long-term risk to business results, with a big price to be paid when environmental factors are ignored as externalities. However, smart CEOs realize big sustainability challenges create new areas of business opportunity."

Achieving sustainable business growth

According to Gartner's annual survey, the leading ways CEOs are using sustainability to drive business growth are through sustainable products and services (33%); sustainable business practices (18%); stakeholder engagement (18%); and decarbonization (18%). Digital investments and innovation is ranked ninth at 8% (see Figure 1).

"Digital technology can accelerate progress toward sustainability goals, going beyond compliance to help enterprises reach targets, enable new business models and unleash revenue streams," said Moyer. According to Gartner, digital technology plays an important role in driving both financial and sustainability outcomes. For example, the Internet of Things (IoT), data and analytics can optimize wind turbines, which reduces costs and greenhouse gas emissions. Al and IoT can reduce food loss costs and waste; whereas a circular economy marketplace can create new revenue and reduce waste.

Climate change driving agenda

The Gartner survey revealed 54% of CEOs say their businesses are affected by changing weather patterns, at least moderately. Over half (51%) acknowledge changing weather patterns are causing them to plan changes to the way they operate or have already done so. "CEOs see that climate change is causing weather pattern shifts that are directly impacting their business operations already," said Moyer. "Those operations must be adapted, with technology playing a vital role in driving these changes, especially in the dynamics of supply chains."

The Gartner survey revealed the biggest impact of changing weather patterns cited by CEOs is operating dynamics (30%), particularly changes to logistics, such as warehousing, timing and routing of deliveries. Relocations (including nearshoring) comes in second (14%), followed by automation, technology and data (13%).

Three areas for CISOs to augment their cybersecurity approach

Chief information security officers (CISOs) who elevate response and recovery to equal status with prevention are generating more value than those who adhere to outdated zero tolerance for failure mindsets, according to Gartner, Inc.

"Each new cybersecurity disruption exposes the fact that CISOs manage more through adrenaline than intention, which is unsustainable," said Dennis Xu, VP Analyst at Gartner. "CISOs need to be resilient through intention, rather than adrenaline, if they want to thrive."

"The industry has made incredible strides on the prevention side of things, but response and recovery remain under-developed muscles because of the industry's zero tolerance for failure mindset," said Christopher Mixter, VP Analyst at Gartner. "In an era where successful cyberattacks are increasing in volume and impact despite preventative cyber investments, organizations must augment their approach to elevate response and recovery to equal status with prevention."

To begin the journey toward augmented cybersecurity, Gartner's label for a cybersecurity function that has elevated response and recovery to equal status with prevention, CISOs should prioritize three areas of activity: building cyber fault tolerance in the business, streamlining to a minimum effective cyber toolset, and building a resilient cyber workforce.

During the Opening Keynote of the Gartner Security & Risk Management Summit, taking place here through Wednesday, Mixter and Xu outlined how to rapidly make progress toward becoming augmented cybersecurity organizations via these three areas.

Build cyber fault tolerance in the business

Gartner recommends that CISOs work to build cyber fault tolerance into their business by focusing first on two areas of business activity where preventative cybersecurity measures are very visibly underperforming: generative AI (GenAI) and the use of third-parties.

For a rapidly evolving technology like GenAl, it is impossible to prevent all attacks at all times. The ability to adapt to, respond, and recover from inevitable issues is critical for organizations to explore GenAl successfully. Therefore, effective CISOs are complementing their prevention-oriented guidance for GenAl with effective response and recovery playbooks.



Figure 1:
Environmental
Sustainability to
Drive Business
Growth

Source: Gartner (June 2024)

Al Semiconductor Revenue Forecast, Worldwide, 2023-2025 (Millions of U.S. Dollars)

	2023	2024	2025
Revenue (\$M)	53,662	71,252	91,955

Source: Gartner (May 2024)

▶ Table 1.

Regarding third-party cybersecurity risk management, no matter the cybersecurity function's best efforts, organizations will continue to work with risky third parties. Cybersecurity's real impact lies not in asking more due diligence questions, but in ensuring the business has documented and tested third-party-specific business continuity plans in place.

"CISOs should be guiding the sponsors of third-party partners to create a formal third-party contingency plan, including things like an exit strategy, alternative suppliers list, and incident response playbooks," said Mixter. "CISOs tabletop everything else. It's time to bring tabletop exercises to third-party cyber risk management."

Minimum effective toolset

One of the places that the zero tolerance for failure mindset is most embedded is in cybersecurity's approach to technology.

"CISOs keep old gear past its sell-by date while also rushing to add new tools without fully understanding the added cost and management complexity they bring," said Xu. "CISOs must break the cycle of gear acquisition syndrome that inhibits their ability to thrive by embracing an ethos of adopting the fewest number of tools required to observe, defend and respond to exploitations of the organization's exposures."

To achieve this, CISOs should:

- Identify redundancies and gaps by mapping their toolset to their controls framework.
- Build technology proofs of concept around deployment risks, not just feature functionality.
- Aggressively pursue GenAl augmentations to existing tools.

Build a resilient cyber workforce

"CISOs and their teams often have a heroism mindset," said Mixter. "They feel they must avoid bad outcomes at all costs, even at the expense of their health. They need innovation, experimentation, and engagement from their people more than ever, but the way they ask their people to operate often has the opposite effect."

To create a resilient cyber workforce, CISOs must treat resilience as a true competency, and build it in their people in the same way they build technical and other competencies:

- Make it easy for employees to get the support they need: This includes building self-care into employee workflows, like counseling and decompression exercises during active incidents.
- Share failure/learning stories: CISOs should set an example and be the first to share examples of times they fell short of their objectives and what they learned from those experiences.
- Reengineer work to reduce burnout: Engage employees to understand where they experience friction in their work, reduce bottlenecks, and leverage automation to free people up to focus their energy on activities that truly demand it.

Worldwide AI chips revenue to grow 33% in 2024

Revenue from AI semiconductors globally is expected to total \$71 billion in 2024, an increase of 33% from 2023, according to the latest forecast from Gartner, Inc.

"Today, generative AI (GenAI) is fueling demand for high-performance AI chips in data centers. In 2024, the value of AI accelerators used in servers, which offload data processing from microprocessors, will total \$21 billion, and increase to \$33 billion by 2028," said Alan Priestley, VP Analyst at Gartner. Gartner forecasts AI PC shipments will reach 22% of the total PC shipments in 2024, and by the end of 2026, 100% of enterprise PC purchases will be an AI PC. AI PCs include a neural processing unit (NPU) enabling AI PCs to run longer, quieter and cooler and have AI tasks running continually in the background, creating new opportunities for leveraging AI in everyday activities. While AI semiconductor revenue will continue to experience double-digit growth through the forecast period, 2024 will experience the highest growth rate during that period (see Table 1).

Al chips revenue from compute electronics to record highest share in electronic equipment segment

In 2024, AI chips revenue from compute electronics is projected to total \$33.4 billion, which will account for 47% of total AI semiconductors revenue. AI chips revenue from automotive electronics is expected to reach \$7.1 billion, and \$1.8 billion from consumer electronics in 2024.

Fierce battle between semiconductor vendors and tech companies

While much of the focus is on the use of highperformance graphics processing units (GPUs) for new AI workloads, the major hyperscalers (AWS, Google, Meta and Microsoft) are all investing in developing their own chips optimized for AI. While chip development is expensive, using custom designed chips can improve operational efficiencies, reduce the costs of delivering AI-based services to users, and lower costs for users to access new AI-based applications. "As the market shifts from development to deployment we expect to see this trend continue," said Priestley.



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Worldwide spending on digital transformation to reach almost \$4 trillion by 2027

Spending on Digital Transformation (DX) is forecast to reach almost \$4 trillion in 2027, according to the latest update to the International Data Corporation (IDC) Worldwide Digital Transformation Spending Guide.

WITH ARTIFICIAL INTELLIGENCE (AI) and Generative AI pushing investments, the DX market is forecast to grow with a compound annual growth rate (CAGR) of 16.2% over the 2022-2027 period. As organizations continue to prioritize digitalization, DX investments are projected to grow substantially, potentially reaching or even surpassing two thirds of all Information and Communication Technology (ICT) spending by 2027.

"Digital transformation is no longer a discretionary investment: companies that want to be competitive and win in the digital economy are leading the way," said Angela Vacca, senior research manager with IDC's Data & Analytics Group. "Today, DX spending represents a bigger market compared to the non-DX portion of ICT spend. And digital business investments are ramping up even faster with the advent of Generative AI which is having an impact across industries; still, opportunities are varied across different market spaces."

The financial services industry is growing at a very fast pace with a five-year CAGR of 20.5% and three use cases that are growing well above the average rate. Robotic Process Automation-Based Claims Processing is the fastest growing use case with a CAGR of 35.1%, followed by Real-time Financial Advice (29.5%) and Digital Banking Experience (29.3%). These use cases have something in common: all three are highly data intensive and rely heavily on AI, generative AI, and data and analytics technologies. The huge advances that financial institutions are employing are transforming their organizations into more effective, more customercentric organizations that can respond more rapidly to changing customer demand and to a fast-moving macro-economic environment.



Worldwide Public Cloud Services Revenue and Year-over-Year Growth, Calendar Year 2023 (revenues in US\$ billions)

Deployment Category	2023 Revenue	2023 Market Share	2022 Revenue	2022 Market Share	2023/2022 Growth
laaS	\$133.4	19.9%	\$115.5	20.7%	15.6%
PaaS	\$123.3	18.4%	\$95.4	17.1%	29.3%
SaaS – Applications	\$298.5	44.6%	\$254.4	45.6%	17.4%
SaaS – System Infrastructure Software	\$114.0	17.0%	\$93.1	16.7%	22.5%
Total	\$669.2	100%	\$558.3	100%	19.9%

Source: IDC Worldwide Semiannual Public Cloud Services Tracker, 2H 2023, May 2024.

The industry that will see the largest DX investments over the 2022-2027 forecast period is Discrete Manufacturing with worldwide spending of almost half a trillion dollars in 2024. This spending will grow to more than \$700 billion dollars in 2027 with Omni-Experience Engagement and Sustainability being the strategic priorities that are growing at the fastest pace among discrete manufacturing companies. The fastest growing regions are Latin America and China, which will have five-year CAGRs of 17.9% and 17.4%, respectively.

"China is entering an era where AI is omnipresent in the digital transformation of business. Supported by various digital-friendly policies, Chinese companies are concentrating on new forms of productivity, leveraging cutting-edge technologies to drive industrial advancement, intelligence, and sustainability," said Jing Qian, market analyst with IDC's Data & Analytics Group China.

"The rise of Gen AI presents both challenges and opportunities for organizations. As digital investments become dominant, it is crucial for organizations to partner with vendors who can provide guidance on resource allocation and effective digital transformation strategies. To stay competitive and innovative, it is essential to harness its potential benefits and avoid missing out on opportunities due to uncertainty," said Mariya Yahnyuk, research analyst with IDC's Data & Analytics Group.

Worldwide public cloud services revenues grew 19.9%

Worldwide revenue for the public cloud services market totaled \$669.2 billion in calendar year 2023, an increase of 19.9% compared to 2022, according to new data from the International Data Corporation (IDC) Worldwide Semiannual Public Cloud Services Tracker.

The largest source of public cloud services revenue in 2023 was Software as a Service – Applications (SaaS – Applications), which accounted for nearly 45% of the market total. Infrastructure as a Service (laaS) was the second largest revenue category with 19.9% of the total while Platform as a Service (PaaS) and Software as a Service – System Infrastructure Software (SaaS – SIS) delivered 18.4% and 17.0% of overall revenue respectively. PaaS and SaaS – SIS were the categories with the fastest year-over-year revenue growth.

"In large part due to end-user investment in AI, PaaS revenue growth continues to outpace the overall cloud market," said Adam Reeves, research director, PaaS for Developers of Modern and Edge Applications. "Both market share-leading vendors and smaller providers continue to release PaaSdelivered AI offerings. Vendors are focused on being strategic partners to their customers by delivering highly performant, developer-friendly, trustworthy, and secure offerings that help users deliver intelligent applications more efficiently."

The leading providers of public cloud services maintained their positions in 2023 with the combined revenue of the top 5 public cloud service providers – Microsoft, Amazon Web Services, Salesforce Inc., Google, and Oracle – capturing 40.5% of the worldwide total. With offerings in all four deployment categories, Microsoft remained in the top position in the overall public cloud services market with 16.8% share in 2023, followed by Amazon Web Services with 12.4% share.

IDC forecasts worldwide public cloud services revenue will surpass \$800 billion in 2024, an increase of 20.5% over 2023 with a similar increase expected in 2025. While the annual rate of growth will slow slightly over the forecast period, the market is still forecast to deliver a five-year compound annual growth rate (CAGR) of 19.5% with worldwide revenues reaching \$1.6 trillion in 2028.

"The mainstreaming of AI is driving organizations to rethink their infrastructure strategy," said Dave McCarthy, research vice president, Cloud and Edge Infrastructure Services. "Public cloud IaaS will be an attractive source for AI-ready infrastructure as cloud



service providers are heavily investing in the highperformance compute, storage, and networking services needed for AI workloads. The on-demand and pay-as-you-go tenets of cloud infrastructure facilitate access to the latest AI technology without large upfront investments or supply chain delays."

Worldwide enterprise applications revenue grew 12.0% in 2023

The enterprise applications market delivered solid revenue growth in 2023 as artificial intelligence (AI), and particularly generative AI (GenAI), has started to reshape the employee and customer experience of business software. According to a new report from International Data Corporation (IDC), the enterprise applications market grew 12.0% year over year in 2023 with worldwide revenues reaching \$356 billion.

The integration of AI and GenAI into enterprise applications brings more intelligence, faster time to insights, and enhanced decision velocity to users. As a result, employees can have a greater reliance on enterprise software as a coworker to help solve business problems and navigate the dynamic world of change.

All of this is possible with increased reliance on cloud technology as the foundation from which to innovate fast, quickly changing up the employee, customer, and partner experiences resulting in faster time to value and competitive differentiation.

"SaaS and cloud-enabled applications continue their growth across the enterprise applications market. With new innovation such as generative Al and its plethora of use cases, the opportunity to reshape businesses with intelligent technology using cloud applications brings greater competitive advantage," said Mickey North Rizza, group vice president, Enterprise Software at IDC.

"Experience-orchestrated (X-O) businesses are leveraging more modern, innovative, and intelligent enterprise applications, improving their decision velocity with smarter business decisions and ultimately bringing greater differentiation for organizations globally."

The top 5 enterprise application vendors in 2023 were SAP, Salesforce, Oracle, Microsoft and Intuit, which together accounted for 21.2% of worldwide revenues. With just 0.2% of market share separating SAP and Salesforce, IDC regards these two companies as statistically tied for the number one position in the worldwide enterprise applications market for 2023. (IDC declares a statistical tie in software competitive markets when there is a difference of 0.5% or less between the market share of two or more companies).

IDC forecasts worldwide revenues for the enterprise applications market will be more than \$600 billion in 2028 as organizations further integrate traditional AI, machine learning, and GenAI into workflows, creating faster and more intelligent insights and decisions. Organizations will also invest in new tools to keep their application portfolio up to date as they move further into the digital era.

Meanwhile, public cloud will become the foundational deployment model for enterprise applications software, accounting for more than 70% of new enterprise applications spending in 2028. Demand for public cloud-based enterprise applications is forecast to produce a five-year compound annual growth rate (CAGR) of 16.5%, surpassing the 11.1% CAGR for the overall market.

The enterprise applications market is comprised of the following secondary markets: enterprise resource management (ERM), customer relationship management (CRM), engineering applications, supply chain management (SCM), and production applications. Each of these secondary markets consists of multiple functional markets.

IDC's software market sizing and forecasts are presented in terms of commercial software revenue. The term commercial software is used to distinguish commercially available software from custom software. Commercial software revenue typically includes fees for initial and continued right-to-use commercial software licenses.

These fees may include, as part of the license contract, access to product support and/or other services that are inseparable from the right-to-use license fee structure, or this support may be priced separately.

Upgrades may be included in the continuing right of use or may be priced separately. Commercial software revenue excludes service revenue derived from training, consulting, and systems integration that is separate (or unbundled) from the right-touse license but does include the implicit value of software included in a service that offers software functionality by a different pricing scheme.



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COVER STORY



Five ways AI is revolutionising the data backup industry



Data is the lifeblood of nearly every business today, so in the event of an unforeseen emergency, such as a data centre going down or a cyber attack striking, the last thing executives want to be worrying about is whether or not their data backups are up-to-date and easily recoverable.

BY IAN WOOD, SENIOR SE DIRECTOR AT COMMVAULT

FORTUNATELY, advances in technology are revolutionising what's possible when it comes to modern data backups. In particular, artificial intelligence (AI) and machine learning (ML) have quickly emerged as two pivotal new technologies, helping businesses of all sizes to implement faster, more efficient backup processes, better evaluate their backup histories, and even spot data security events before they occur. Should the worst happen, AI and ML can also be used to get businesses back up and running as quickly as possible, minimising potential lost revenues and reputational damage that can result from prolonged periods spent trying to recover key data.

Simply put, AI and ML are far more than just novel innovations for employees to play around with; they are vital assets that can keep data safe and ensure businesses are prepared for any eventuality. Below are five ways that IT teams are already benefitting from these technologies in relation to their data backups:

Rapid detection of cyber attacks

Data backup goes hand in hand with cybersecurity. Cybercriminals know that effective data backup can greatly diminish the impact of an attack, which is why they will often try to compromise both productive data and backup files simultaneously. However, AI can increasingly be used to identify data anomalies created by attackers and correctly flag them as indicators of an attack in progress, alerting businesses much earlier than would otherwise be possible through manual analysis.

Effective recovery of both data and infrastructure IT teams can use AI and ML to define optimal recovery time objectives (RTOs) and recovery point objectives (RPOs) with minimal information loss and rapid re-availability, as well as receive alerts when predefined SLAs on data availability may no longer be met. The benefits don't end there, either. AI can also help define the necessary recovery steps in advance of a disaster. A clean, malware-free recovery in a cloud cleanroom benefits from AI- and ML-powered definition of the last clean backup in a dataset.

Optimisation of scheduled backup tasks

Traditional backup plans typically rely on static rules and schedules, which can lead to complicated configurations and inefficient processes. However, by using time series-based ML to predict job run times, AI- and ML-powered data management platforms constantly improve the job calendar through optimal sequencing. Cyber-resilient data protection platforms calculate best possible RPOs for cyber-resilient data protection and prioritise recovery workloads based on availability targets.

At the same time, AI can be used to minimise the time windows necessary for data backup. What's more, all this can be done autonomously, meaning IT team members don't have to spend time manually intervening at any point.

Streamlined data monitoring

Al can be used to continuously collect and analyse performance data from thousands of daily tasks and backup operations, which would be virtually impossible to do manually. If any anomalies are detected, they can be classified according to severity, type, and frequency in real-time, making it much easier for the IT team to identify which ones need immediate attention and which are less urgent. Without this capability, many critical errors go undetected for much longer periods of time, increasing the risk of backups failing at inopportune moments.

Data prioritisation in the event of a data loss incident Finally, AI and ML can help IT teams quickly determine which data should be restored first in the event of an attack or data loss incident taking place. Teams can train AI tools to identify the document types that are particularly critical to business While innovations like generative AI tend to grab the media headlines, AI as a technology stands to revolutionise almost every aspect of business operations over the next few years. Data backups are just one part of this, but in the event of a cyber attack or data centre outage, they can quickly become critical to business continuity, or even survival in some cases

operations, based on key factors such as access and sharing frequency. Should an incident occur, the tools will then know to prioritise these documents as part of any restoration processes taking place, helping to minimise disruption caused.

A new benchmark for data backup capabilities

The emergence of AI and ML has rapidly reshaped the data backup industry, giving businesses potent new tools to protect their sensitive data in an increasingly hostile digital landscape. These technologies have set a new benchmark when it comes to backup capabilities, from spotting cyber attacks in progress and facilitating effective data recovery, to streamlining monitoring processes and optimising backup tasks.

While innovations like generative AI tend to grab the media headlines, AI as a technology stands to revolutionise almost every aspect of business operations over the next few years. Data backups are just one part of this, but in the event of a cyber attack or data centre outage, they can quickly become critical to business continuity, or even survival in some cases. Consequently, it's well worth exploring the benefits of AI-powered data backup before it's too late.



Unlocking AI's full potential starts with effective data protection

Powerful applications require powerful protection, which is why a growing number of organisations are already turning to solutions like CDP to keep their Al workloads safe.

BY CHRISTOPHER ROGERS, SENIOR TECHNOLOGY EVANGELIST AT ZERTO, A HEWLETT PACKARD ENTERPRISE COMPANY



THE EMERGENCE of mainstream Artificial Intelligence (AI) over the last few years has fundamentally changed the way many of us live our lives, both personally and professionally. AI-powered applications have already become widespread in industries like healthcare, banking, and retail, all of which are helping to streamline business operations and make customer experiences more seamless. In fact, it's quickly becoming apparent that the only limitation AI has is that of the human imagination.

As the popularity of Al continues to grow, so too will the importance of Al workloads. This, however, raises key questions for organisations about how best to ensure these workloads are kept running without unexpected downtime, and even more importantly, how the underlying data can be properly secured without affecting overall business agility.

The limitations of traditional backup solutions

In order to protect against unplanned outages and data loss, many businesses continue to rely on



traditional backup solutions. This is fine for many aspects of day-to-day operations, but when it comes to disaster recovery and business continuity, such solutions are no longer adequate, particularly where critical business data and workloads are involved. This is because traditional backups only protect individual servers, but not complete applications.

After restoring data from a backup, the applications must first be manually reassembled from their individual components. This process can be painstaking, which is why restorations done from backups can often take days, weeks, or sometimes even months.

When it comes to critical AI workloads and applications, companies need solutions that can guarantee much faster recoverability. For this reason, more and more are turning to Disaster Recovery (DR) solutions, which offer far better recovery speeds compared to traditional backup solutions. At present, CDP (Continuous Data Protection) is the most effective recovery solution available. CDP works by keeping a continuous record of every change to a company's data as soon as it is made. As a result, if an attack happens and recovery is required, data can be returned to the same status as it was just seconds before the attack took place, meaning very little data loss, if any, is incurred.

Protecting critical AI applications with near-synchronous replication

Effectively protecting critical AI applications requires the lowest possible Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs). One of the best ways of achieving this is through the use of near-synchronous replication, which offers the performance of synchronous replication without the high network or infrastructure requirements typically associated with it. Near-synchronous replication is technically asynchronous replication, but it is similar to synchronous replication in that data is written to multiple locations simultaneously, allowing for a small delay between the primary and secondary locations. Because it is always on, it does not need to be scheduled, doesn't use snapshots, writes to the source storage, and doesn't have to wait for acknowledgement from the target storage.

One of the key advantages of near-synchronous replication is that it provides a high level of data availability and protection, while still allowing for faster write speeds than synchronous replication. This makes it a good choice for workloads like critical Al-applications with high write loads and/or large amounts of data.

Overcoming data mobility challenges

Al works by learning from huge amounts of data – the more the better. For this reason, the scale of data required for Al applications to work effectively is unlike anything most IT teams have ever had to deal with before. Even simple applications will use exabytes of raw data that needs to be carefully prepared for model training and subsequent inference. The data sets are often created on the edge and need to be transferred for processing into a central data repository. Furthermore, once an Al data lifecycle has come to an end, the data used needs to be archived for potential re-training in future. All of this creates completely new challenges for IT infrastructure and management as these huge amounts of data need to be able to be moved continuously. Lifting and shifting these huge data sets will not be possible with the current network technology and data management solutions based on synchronous replication. To still be able to move Al data with limited processing power and bandwidth, asynchronous replication will have to be used. This ensures continuous replication with low bandwidth on a block level that does not produce high peaks of data transfers.

We've only just started to scratch the surface of what AI is capable of, but the potential is already there for everyone to see. While stories about it being used to create hit songs and replicate the painting styles of the world's greatest artists make good headlines, the true future of AI lies in helping humanity solve much bigger challenges, from eradicating diseases to detecting natural disasters.

However, powerful applications require powerful protection, which is why a growing number of organisations are already turning to solutions like CDP to keep their AI workloads safe. Furthermore, the sheer scale of data involved is creating entirely new challenges that must be properly addressed using suitable data-mobility solutions before AI's full potential can be realized.



STORAGE

Al and flash storage

A look at how flash storage and Al have impacted each other, and how flash prices are set to change.

BY FEDERICA MONSONE, FOUNDER AND CEO, A3 COMMUNICATIONS, THE DATA STORAGE INDUSTRY PR AGENCY

FLASH MEMORY was, without doubt, a groundbreaking technology when it first entered enterprise datacenters around two decades ago and immediately began transforming the performance of a wide range of applications.

We wanted to understand the relationship between flash and the revolutionary developments that are now happening in artificial intelligence (AI), so we assembled a group of experts and asked them how much impact flash has had on AI and on the related fields of analytics, IoT and edge computing. Vice versa, we also asked our experts how much those technologies will change the adoption rate of flash. Because cost is a driving factor affecting the implementation of any technology, and flash prices have tumbled over the last twenty years, we also asked our experts whether they expect flash prices to continue falling over the next five years.



The relationship between AI and flash is hard to define

The more data that an application needs to access, the greater the performance boost delivered by storing data in flash rather than on spinning disk. Because AI is a highly data-intensive application, it might seem reasonable to presume that without flash, there would be no modern AI. However more than one member of our panel questioned that notion.

"Some in this industry argue that we would not have today's AI without the past decade's shift to solid state storage. While that may be true, it's enormously difficult to prove. AI training consumes enormous resources, and SSDs [solid-state drives] have accelerated the advancement of computing performance across the board, so AI will have benefited from this," said Jim Handy, general director at analyst firm Objective Analysis.

He added: "The same holds true of any discipline based on advanced computing technology, whether it's analytics, nuclear physics, or meteorology." David Norfolk, practice leader for development and government at analyst firm Bloor Research, said: "Insofar as flash makes storage faster, cheaper, and more reliable, it enables data-intensive innovations such as Al/ML, analytics, IoT, and edge processing. Conversely, these innovations need more fast, cheap, reliable storage and I'd expect flash take-up to track the take-up of these innovations." Leander Yu, president and CEO of Graid Technology said: "Flash memory and all-flash array storage solutions are all about performance. The killer apps of AI/ML and analytics are where customers are investing in their IT infrastructure, and these workloads demand the performance delivered by all-flash storage."

A wider view is taken by Peter Donnelly, director of products at storage networking vendor ATTO, who said: "I believe that we're in the middle of a dramatic change in how and where data is collected and consumed. This is driving the need for the disaggregation of the data center. It's not to say that data centers will cease to exist, but they are becoming less structured and more flexible. This is an important dynamic that is driving the need for flash memory and flash storage. How do we access and use data that is across the country, or even around the world, in a way that makes it seem like it's located locally? Flash helps answer that challenge, and it enables emerging technologies like AI and data analytics at a scale that was impossible until now."

Al and analytics are changing the architecture of flash-powered storage systems

But even if the impact of flash on AI, analytics, IoT, and edge processing is difficult to quantify, flash is certainly a key element in the IT infrastructure built to handle those workloads. When it comes to implementing AI, that infrastructure is about to receive more attention than it has to date, according to Randy Kerns, senior strategist at analyst firm the Futurum Group.

"I think we are just beginning to see the importance of the underlying device technology used for AI/ML. Currently the focus has been on the algorithms and data conditioning from multiple sources to operate on and build the training and test data. Rightfully so, getting the functional aspects working has been where the attention has been placed.

Now, as this is maturing, the importance of improving the technology and getting results faster will bring the technologies for storage into greater consideration. Some implementations may be further along than others, but we will see more importance in Al/ML and use of flash storage as a given," said Kerns.

The ability of flash to handle small, random data accesses or IO operations fits the needs of AI/ML and analytics. "Hard disk drives are steampunk devices. SSDs have, as a result of their enormous IOPs [IO operations per second] advantages, taken over all workloads that involve small and/ or random transfers. AI/ML training and analytics involve randomness in their I/O workloads, and IoT is dominated by extremely small transfers, making both early success stories for all-flash storage systems," said Curtis Anderson, software architect at Panasas, a supplier of storage software for workloads needing high performance.

As well as contributing to the take-up of all-flash storage systems, the performance needs of Al/ ML are also driving architectural changes within those systems. "Architectural considerations around how data enters and leaves the storage are also important. This is why traditional HPC storage is well suited to Al workloads, and there are many new storage companies entering the marketplace who are leveraging flash and NVMe [the storage protocol used to access flash] to deliver low latency across the board and eradicate any potential bottlenecks at the storage layer," said Amos Ankrah, solutions specialist at Boston, a provider of high-performance servers and storage systems.

From TB to PB - the scale of flash usage varies hugely

Al applications such as autonomous driving and large language models (LLMs) are in Anderson's words "poster children" for the use of huge datasets to train Al models. As an example, he cites Tesla's use of more than a staggering 200PB of what the car maker calls "hot-tier cache capacity." However, Anderson says most organizations are using far smaller datasets for Al development. "The vast majority (by count) of Al/ML projects have (significantly) less than 100TB of capacity needs," he said. That is 2,000 times less capacity than Tesla's hot tier.

Anderson and his colleagues at Panasas expect that these more typical AI datasets will grow, but only slowly. That is just as well, because flash is significantly more expensive than disk, but its usage is often essential for AI training. The gap between disk and flash performance is even wider for AI than for other applications, because of the general random nature of AI data access. For decades, storage vendors have compensated for the relatively low speed at which disk drives handle semi-random requests to access data by identifying



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hot or frequently-accessed data and storing it in very fast DRAM-memory read caches. "Read caching helps a lot when a small percentage of the data is being accessed multiple times.

Al/ML doesn't fit often with those traditional I/O access patterns which forces organizations to take a largely flash-based approach for many Al/ML workloads," said Steven Umbehocker, founder and CEO at OSNexus, a vendor of scale-out, softwaredefined storage systems.

Performance is not the only flash virtue, especially for IoT and the edge

Performance is not the only advantage that flash offers compared to disk, as SSDs consume less power while also potentially being more reliable and able to withstand challenging environments. "In applications like IoT, edge processing, and TinyML (machine learning at the edge) one of the top design priorities is the ever-increasing drive to decrease power consumption – both dynamic and standby



power - while ensuring the highest possible performance. On top of this, for any IoT design, keeping costs down is another huge priority," said Coby Hanoch, CEO and founder of Weebit Nano, a developer of next-generation solid-state memories. The ability of flash to survive harsh environments is another advantage. "If we mean at the edge, infrastructure at cell towers and other local infrastructure, then solid state storage, particularly SSDs, are a definite enabling technology since they perform better at extremes of temperature that other storage technology, such as hard disk drives, which would find these difficult," said Tom Coughlin, president of analyst firm Coughlin Associates, and member of the Compute, Memory and Storage Initiative at industry body Storage Networking Industry Association (SNIA). Roy Illsley, chief analyst at research firm Omdia, highlighted another physical characteristic of flash when he said: "A second aspect worthy of note is that for edge use-cases the ability to operate from a small footprint so the AI inferencing workloads can be deployed in remote locations means flash is the storage of choice when physical space is a restraining factor."

Dennis Hahn, principal analyst at Omdia, said that flash storage at the edge is often within hyperconverged infrastructure (HCI.) "In use-cases like edge, processing real-time results is often the case, so fast flash storage local to the processing servers is necessary. In its research, Omdia has found that these edge systems are frequently HCI systems using SSD devices." But this does not mean that IoT data is always stored in flash. " Data collection like that of IoT often focuses more on cost, and the data frequently travels over the relatively slow internet. [As a result] bulk storage solutions like HDD are more frequently used. But, ultimately, flash comes into play for its speed in enabling IoT data processing."

Referring to the NOR variant of flash that is embedded in system-on-a-chip processors, Weebit Nano's Hanoch said: "In devices performing AI or ML at the edge, flash is used not only for code / firmware storage and boot, but importantly flash, and even more so newer types of NVM like ReRAM, is also used to store the neural network weights needed for AI calculations. To support this functionality while keeping cost and power to a minimum, we're seeing designs pushing to more advanced nodes such as 28nm and 22nm, currently the sweet spot for IoT and edge devices. This requires NVM that is embedded in an SoC monolithically, but embedded flash can't scale to 28nm and below, so designers can't integrate it with other functionality on a single die. This is a huge challenge in designing these small, inexpensive, often battery powered devices."

The gap between disk and flash prices will not change

The variant of flash memory that hugely dominates flash usage is NAND flash. Until the late 90s,

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NAND flash was a very expensive and rarely used technology. This situation changed in the late 90s when makers of battery-powered devices such as MP3 players and mobile phones were searching for a data storage medium that consumed less power than miniature disk drives. NAND flash fit the bill, production soared, and prices plummeted. Surprisingly however, it was not until around 2004 that NAND flash became cheaper than DRAM memory.

However, the important price comparison has always been between flash and disk. Although the price of flash has been falling for the last twenty years, so has the price of disk drives, when both are measured in terms of dollars per unit of storage capacity. For the last decade the gap between the two has been relatively steady. "SSD \$/TB have maintained roughly the same 5x-7x multiplier over HDD \$/TB over the last ten years," said Anderson. That estimate of the price difference was echoed by Umbehocker and by Giorgio Regni, CTO at Scality, who both put the per-TB price difference at five-fold. "We don't think the market is pushing flash vendors very hard to change that in the future," said Anderson. Referring to so-called fabs - the fabrication plants that make flash and other semiconductor chips - Anderson added: "There are only a handful of flash fabs around the world and new ones aren't being built at a rate that will outstrip the growth in the demand for flash." Again, this view was shared by other experts, who pointed to the need to build new fabs to increase global output, and the enormous expense of doing so, which ranges from hundreds of millions to billions of dollars per fabrication plant, and the years of planning and construction required.

Experts expect flash prices to continue falling

On a short-term basis, flash prices have a history of dramatic variations. For Objective Analysis, Handy said: "During shortages prices typically flatten, but sometimes they increase a little. In very rare cases they increase substantially, like they did in 2018. When the shortage flips to an oversupply there's always an alarmingly rapid price collapse. We had that collapse in the second half of 2022, when prices fell by up to 70%."

Boyan Krosnov, CTO and co-founder at StorPool, a vendor of software-defined, distributed storage

The worldwide economy will be the largest driving factor, outside of new revolutionary breakthroughs in flash manufacturing. Supply chain ripples will follow the bullwhip effect for the foreseeable future



systems, outlined the factors that influence long term price trends for flash. "Future price of flash would depend on cost of capital, energy costs, supply and demand, which is heavily dependent on overall growth of IT infrastructure. So, if you believe that the world economy is going to grow and IT infrastructure will grow even faster, then in the next 1-2 years the price of flash will be increasing. Then fab capacity will catch up and in a few years price will go back to the slow downward trend."

Shawn Meyers, field CTO at Tintri agrees: "The worldwide economy will be the largest driving factor, outside of new revolutionary breakthroughs in flash manufacturing. Supply chain ripples will follow the bullwhip effect for the foreseeable future." However, between price collapse and price surges, per-TB prices slowly fall, according to Objective Analysis' Handy, who said the price trends are surprisingly predictable and that his company produces the industry's most consistently accurate price forecasts. So how fast does Objective Analysis believe flash prices will fall over the next five years? "From now until mid-2028, the average price decline will be about 15% per annum," Handy said, adding that a possible shortage in mid-to-late 2024 would be followed by oversupply and price collapse in 2026.

However, Regni at Scality predicted an ever faster decline in price for the lowest-cost QLC variant of flash. "Based on roadmaps from hardware and disk manufacturers, we see a decline in the cost (measured as \$ per Terabyte) of high-density (QLC) flash SSDs to decrease dramatically. Data shared with us shows a 60%+ decline between 2022 and 2025," said Regni for Scality.

That 60% decline in price cited by Regni for QLC flash equates to a 26% compound average reduction from 2022 to 2025, which would be significantly faster than Handy 's 15% prediction for overall flash prices over the longer time period of 2023 to 2028. Regni added: "While this is a faster decrease than equivalent high-density HDDs, we still see HDDs maintaining a 5x cost advantage over SSDs in the same time frame," he said.



Edge is transforming the multiplayer experience for urban gamers. Here's how

If you like to wind down after a hectic day at work by playing games online, you're not alone. The market is surging, with an estimated three billion gamers around the world joining virtual realms and immersive digital environments.

BY AARON PARTOUCHE, INNOVATION DIRECTOR, COLT TECHNOLOGY SERVICES

THE GAMING INDUSTRY is making more money than both the music and film industries put together, according to one report. Cloud is a huge driver in making gaming accessible, transforming the gaming experience with access-from-anywhere gameplay, fast updates and enhanced security.

There's one particularly transformative change that Cloud has brought to the industry: the multiplayer gaming experience. It's quickly overtaken single player gaming as games like Overwatch, Call of Duty, Sea of Thieves and Fortnite have pioneered sociable, strategic gameplay with rich content, while services like Xbox Cloud Gaming ramps multiplayer gaming up another level, with access from mobile devices, tablets and PCs facilitating a seamless, global competitive experience.



Before gamers experience the true potential of cloud-based multiplayer gaming, though, there's one more level to breakthrough: latency is the nemesis of gamers the world over. Latency, or ping, is the time it takes for the server to respond to a player's command. The lower the number, the better the experience. The inevitable lag or delay it causes significantly impacts the multiplayer gaming experience, resulting in a frustrating, glitchy deterioration of quality and performance. 20 to 40 milliseconds is the ideal ping or latency; 40 to 60 milliseconds is good while over 100 impacts play.

As well as a player's own network connection quality impacting latency, gamers located in densely populated urban areas also experience higher latency and impacted performance, as they're sharing digital infrastructure. Overloading servers can impact latency, particularly around major events like new season launches, while players' distance from servers can also increase latency and create a frustrating lag. Usually, servers are located in global data centres, so unless you live nearby, it takes longer for data to return and for your response on-screen. Ping is taken very seriously: it's not uncommon for professional gamers to relocate to Texas, in search of the ultimate zero ping. Fortnite and Rocket League have servers located there,

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so if you're serious about competing for money in games like these, it's your best chance to boost your performance. But let's face it - you've got to be very committed to follow the ping.

Low latency gives players a strong competitive advantage with swift responses, faster reactions and smoother game transitions. It's not a quickfix response though: other than checking and upgrading Wi-Fi connections, or upgrading to more powerful and expensive gaming PCs and consoles, there have been few options for gamers that truly transform their experience. As well as being frustrating for gamers, this runs the risk of stifling the creativity and innovation that the gaming industry has trailblazed over the past few years.

Now, the tech industry is addressing this, reengineering its networks to give gamers the ultimate user experience. Tech companies and collaborations are taking a hybrid, distributed approach to connected digital networks, building game servers on true Edge infrastructure. This 'decentralised' approach involves pushing computing resources such as servers to the network edge, so servers are located as close to gamers as possible. If the player's device doesn't have to wait for a response from a data centre located many miles away, latency is reduced - and if it doesn't have to jostle for space with huge volumes of traffic, the network is decongested and gamers finally

experience the gameplay of developers' dreams. The power and potential is immense: nextgeneration gaming orchestration platforms and street-side tech hardware companies are partnering with digital infrastructure companies, pushing the boundaries of what is possible. One collab between Colt, Edgegap and CIN is already redefining the gaming experience for Londoners.

The partnership delivered the world's first game server running on true edge computing, integrating Edgegap's technology with Colt and CIN's physical infrastructure network – with London chosen as the first location. Colt's edge computing platform and network on demand connectivity deployed through CIN's Street Arc build the underlaying digital infrastructure supporting the gaming application. The integration dramatically improves multiplayer gaming experiences for Londoners, eliminating lag and latency issues and leaving them free to focus on honing their skills, strategies and competitive advantage.

As developers explore even more feature-rich immersive worlds with the evolution of AR, VR, AI and the metaverse, gamers' expectations will keep on rising. There will come a time when latency that impacts their performance will be seen as unacceptable. The days of centralised servers are numbered, and it's down to the tech industry to seize this opportunity to lead, to innovate and to transform.

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Sukhi Bhadal



What are the four ways to mitigate latency and packet loss?

Latency and packet loss may be a small issue to organisations with low data volumes, it's an issue that starts making itself very noticeable as you move up the bandwidth ladder and large data volumes.

BY GRAHAM JARVIS, FREELANCE BUSINESS AND TECHNOLOGY JOURNALIST, LEAD JOURNALIST, BUSINESS AND TECHNOLOGY, TRUDY DARWIN COMMUNICATIONS



LATENCY AND PACKET LOSS worsen Wide Area Network (WAN) performance, causing network jitter. To solve this, organisations often feel that the solution is to buy bigger and bigger pipes, but this doesn't necessarily improve bandwidth utilisation and network performance. Equally, John Burke, CTO of Nemertes is right to suggest that the "performance of cloud-based apps that create a lot of network traffic can be hurt by network loss and latency." At least, that's what the standfirst says.

In his November 2022 article for Network World, '3 Ways to Reach the Cloud and Keep Loss and Latency Low', he states that there are ways to mitigate, rather than completely resolve issues such as latency and packet loss. This also applies to the adoption of public cloud laaS platforms, such as



AWS and Azure, and PaaS and SaaS solutions. They have been promoted on the basis of the simplicity of consuming services, whereby it's possible to connect securely over the public internet to "start spinning up resources." However, he says private communications with those resources still leaves some challenges and choices that have to be made.

His answer is to use the internet with a VPN to connect to virtual private clouds (VPCs) "or their equivalent from company data centres, branches or other clouds." However, again, latency and packet loss can become troublesome – even more so over significantly long distances.

In his view, the answer to resolving these issues is threefold: a dedicated connection to the cloud via an organisation's private network; the utilisation of an exchange simplifies the process of connecting to multiple cloud providers or connecting more flexibly to any provider; and internet access to an exchange to maintain direction connections. One means of mitigating latency and packet loss is missed out, though. That is WAN Acceleration, which shouldn't be confused with WAN Optimisation.

WAN Optimisation v WAN Acceleration

The differences between these are explained by Sudip Saha, Managing Director and Co-Founder at Future Market Insights, in his article, 'Global WAN Optimisation Market Poised for Robust Growth, According to New Analysis Report.' WAN Optimisation is a good technology but, unlike true WAN Acceleration, it can't send and receive encrypted data natively. Therefore, to optimise the encrypted data, it has to have the keys to decrypt the data. WANop then optimises it before encrypting the data back again and sending it. In contrast WAN Acceleration can send and received encrypted data without this lengthy process. It can also achieve higher data throughputs than WAN Optimisation often can.

WAN Acceleration also uses artificial intelligence, machine learning and data parallelisation to better control and accelerate data flows, while mitigating the effects of latency and packet loss. WAN Acceleration also boosts bandwidth utilisation by at least 90%. Unfortunately, in comparison, WAN Optimisation often fails to live up to its vendors' promises.

Saha, nevertheless, comments in his article, published on Marketresearchblog.org on 21st March 2024: "According to the detailed report by Future Market Insights, the global WAN optimisation market recorded sales of US\$ 935.1 million in 2018. The market is anticipated to achieve revenue of US\$ 1,150.9 million in 2023. Over the forecast period, the global market is projected to expand at a CAGR of 6.2%, resulting in a market size of US\$ 2,106.9 million by the end of 2033."

That aside, Stephen Pritchard reports for ComputerWeekly in his article, 'Cloud-to-Cloud Backup: What It Is and Why You (Probably) Need It', that organisations often use cloud IT or cloud-based applications in "the belief they can spend less time managing IT and more time running the business." He says this is because people believe that this technology is both robust and reliant. Yet, when it comes to data protection, the absolute opposite can often be true.

He explains: "In fact, the basic protections for files and applications provided to customers by cloud and software-as-a-service (SaaS) suppliers can be very limited. This means CIOs need to make their own arrangements to back up data in the cloud." Quite often, this is done with WAN Optimisation or SD-WANs, but even the latter benefits from true WAN Acceleration solutions, such as PORTrockIT. Network Wild West

David Trossell, CEO and CTO of Bridgeworks, reminds us that as soon as data is let loose outside of a data centre, control over the data transfer is lost. In other words, "We can no longer manage congestion, packet loss or latency - the killer of TCP/IP performance and lastly bandwidth." He adds that organisations are, from the point, in the hands of the carriers and cloud companies. "This purely a money issue - the more we spend, the more control on the key factors that affect performance," he says. With regard to the internet - the value end of connectivity to the cloud is for organisations that don't have massive data transfer requirements. He explains: "It depends where you are located, city versus rural. However, you take your chances with this method, as you are fighting with others with line contention and wildly varying latency and packet loss."

"Another issue with the Internet is when the packets you send over the internet take different paths, packets can arrive out of order! We have to wait for the missing packets to arrive or request them again. If you are going to use the internet – please use a VPN. One word of caution, the VPN will not solve the issue of packet loss or cloud."

The network value chain

Moving up the value chain, there are a few more options. However, they often come at a significant cost. Those options include dedicated links to a cloud provider. Trossell says they typically include 1Gb to 10Gb WAN connections. "Here your latency and packet loss are much more stable, and under control," he suggests, before commenting that the inherent performance killer of TCP/IP and network performance is latency. So, an organisation that wishes to egress and ingress large amounts of data may find that their WAN performance is inhibited, and that less performance than is expected comes out of having spent loads of pounds or dollars on increasing bandwidth.

He warns: "A note of caution that many of the cloud providers use the big carriers to provide their networks. These carriers sometimes oversell the bandwidth hoping not everyone will use the full capacity of their allocated bandwidth. A bit like the airlines selling more seats than they have expecting some passengers not to turn up. It happened to a large one of our large customers."

Dedicated private bearer

The solution offered by most carriers is to provide organisations with a dedicated private bearer, linked to an internet exchange. This goes out from that exchange to the internet and then to the cloud companies. Trossell says carriers will happily provide you with all the bandwidth you can afford. He finds that this is ideal with those organisations that have a large presence in the cloud, and/or use the cloud as an offsite backup location.

As mentioned earlier, SD-WANs are another option for access to cloud providers and the internet. While he says SD-WANs provide more control over the access from the user to the cloud with the ability to separate traffic destined for the internet from the cloud traffic, they often need a WAN Acceleration overlay to boost their performance by mitigating latency and packet loss. SD-WANs on their own and WAN Optimisation don't often go far enough to address latency and packet loss. Trossell concludes that whilst latency and packet loss may be a small issue to organisations with low data volumes, it's an issue that starts making itself very noticeable as you move up the bandwidth ladder and large data volumes. He therefore recommends WAN Acceleration, and stresses that using a VPN makes no difference and has no impact on latency. Anyone using a VPN is still using the internet, and all that it does it protect that person's data from others reading it.

Expanding horizons: embracing global connectivity via remote peering

Navigating the ever-changing networking landscape can be a difficult task for businesses, and even network operators themselves. Although different businesses have unique connectivity needs, they all share a common goal of providing fast, reliable, and secure connections to their customers, end users and their digital services.

BY MARK DALEY, DIRECTOR OF DIGITAL STRATEGY & BUSINESS DEVELOPMENT, EPSILON TELECOMMUNICATIONS



REMOTE PEERING is a rising trend that allows businesses such as internet service providers (ISPs), content providers, network operators, carriers, and even enterprises, to exchange data and internet traffic.

This exchange is enabled by Internet Exchange Points (IXPs), where the exchanging of traffic is known as peering. Businesses can peer with other businesses without being physically present at the peering location, making it easier to expand their global reach in a fast and cost-efficient manner.

Peering reduces latency and improves the performance of applications and services, thanks to shortening the distance that data travels to reach end users. It also provides direct access to an ecosystem of thousands of other peering members via a single connection.

Despite all these perks, establishing a presence at various IXPs can be difficult and costly without the appropriate knowledge or experience and without understanding the peering solution options available to them.

However, by partnering with an expert provider, there is an opportunity for businesses to overcome these challenges to deploy the right peering solution that allows them to achieve greater adaptability, scalability, and operational efficiency through a centralised peering connection.

The different types of peering

Larger network providers may choose to deploy private interconnects to exchange internet traffic. But this is a relatively exclusive model. Most businesses will initially consider Direct Peering by deploying a fibre connection to an IXP located in the same data centre, and then 'peering' with other networks via the IXP.

However, Direct Peering requires the business to be in the same location as the IXP, requiring resources such as space, power, hardware, and intricate cabling, making it difficult to manage. And as the business' IP traffic volume grows, scaling and maintaining the network architecture becomes an even larger challenge.

A solution for this is Remote Peering, which enables businesses to connect to an IXP without requiring a physical presence at the same location. This makes it easier and more cost-effective to access multiple IXPs around the world, without incurring additional installation expenses or needing to colocate in the same facility. In contrast to Direct Peering, Remote Peering offers a flexible and seamless way to connect to IXPs worldwide. **OPPORTUNITY Remote Peering is** an appealing option AHEAD for businesses looking to expand their global network coverage while keeping operating expenses under control. Businesses can connect to a multitude of networks via multiple IXPs, all through a single interconnection port. They can also improve network redundancy by distributing connectivity

requirements across several IXPs – utilising the ideal balance of physical and remote peering connections to guarantee uninterrupted service for their customers and end users.

Unlocking remote peering success with NaaS

Collaborating with an experienced Network as a Service (NaaS) provider is one of the best ways for businesses to get started with Remote Peering. These providers offer assistance in flexibly scaling network and peering services to match evolving demands, along with the convenience of accessing additional network services via a NaaS platform with a simple click.

Remote Peering with a professional provider unlocks numerous opportunities and key advantages for businesses. It facilitates direct and extensive connectivity to global IXPs without the need for physical presence, while also allowing for bandwidth adjustments to meet specific needs.

Businesses can mitigate network latency by minimising the number of hops between service providers, achieving optimal performance for bandwidth-sensitive applications. This approach eliminates the need for significant upfront investments, as businesses only pay for the necessary bandwidth and connections. An expert provider can also handle all IXP memberships and onboarding processes, consolidated under a single contract, to streamline the business' peering journey. Businesses can overcome the expenses and time constraints associated with maintaining physical presence at multiple IXPs, since preferred peering partners are conveniently accessible through a single interconnection port.

Seamless network integration

In today's always-on digital world, businesses must ensure seamless end-user experiences through high-performance connectivity, no matter the location.

Remote Peering is a versatile solution that can help businesses to overcome common networking challenges, meet customer demands and tap into a network of partners and opportunities by connecting to IXPs worldwide without physical presence. It presents a reliable and cost-efficient option for establishing a presence in new markets and expanding globally.

Businesses can simplify the complexities of peering by collaborating with an expert NaaS provider, benefitting from a team of experts dedicated to their success. In addition to immediately addressing a variety of networking challenges, it enables businesses to add longevity to their network architectures and achieve long-term success across the globe.



NETWORKS



Ready for the future of work? Start with SD-WAN

With the office now just a click away for millions of employees, businesses are being forced to embrace digital transformation faster than ever before as they battle for market space and talent.

BY IAN HODDLE, DIRECTOR OF ENTERPRISE, VIRGIN MEDIA O2 BUSINESS

MANY WORKERS are optimistic about the role of emerging technology in the future of work, according to research from Virgin Media O2 Business.

Nearly half (46%) of deskless workers agree that technology will play a key role in the future of work, over a third (36%) are excited by the possibilities, and 32% believe they would be more productive if their company adopted more emerging technologies.



Many of these emerging technologies will no doubt be powered through AI and automation. And while there is a lot of content about how AI can boost productivity, it's important to remember that connectivity is key to making this tech work. CEOs may be asking their IT teams 'How should we be using Al?' But a better question would be 'Can our organisation support Al?' After all, dreams of productivity boosts won't happen if businesses don't prioritise having a solid network in place.

Want employees to truly engage with new tech and become more productive? To work from anywhere and access data from whatever device they may be using? Al might help here, but you need the right network architecture first.

This is where SD-WAN (Software-Defined Wide Area Networking) enters the fold.

With its ability to optimise network performance, enhance security and provide greater flexibility,

NETWORKS

SD-WAN can help people get the most from the network, wherever they may be working.

Analysing existing limitations

The UK's enterprise networks have been experiencing dynamic growth and transformation, as digital connectivity is increasingly essential for businesses. According to CBI, 81% of businesses say they see mobile connectivity as crucial.

Hybrid workers need to access data regardless of where they're situated, and therefore need a reliable network with a robust technological infrastructure in place.

Traditional Wide Area Networks (WANS) were not designed with the demands of modern hybrid working in mind. As a result, they can have bandwidth limitations, inconsistent latency and inefficient traffic management. This means many businesses may want to first consider what their connectivity needs are to then determine whether they have the right solutions in place for their organisation.

SD-WAN stands as a unique solution

SD-WAN is a virtual WAN architecture that efficiently connects users to a centralised cloud system, regardless of their location.

It routes traffic dynamically and securely over multiple connections to the cloud - from MPLS to broadband and LTE - making it ideal for businesses working remotely over multiple sites. Helping businesses benefit from enhanced application performance and greater operational agility.

ROI savings can be seen in different ways. Not only do you make savings from an increased overall network capacity and availability, but there are also time savings from the reduced operational load required to manage and secure the network.

Managing a hybrid workforce can strain IT resources, especially when businesses need to maintain and troubleshoot network issues. By automating routine tasks, and dynamically directing data through the most efficient paths in real-time, IT teams can quickly troubleshoot issues remotely, gaining comprehensive visibility into their network performance.

Security is also a key concern for employees. It's common for businesses to access their corporate networks from different ROI savings can be seen in different ways. Not only do you make savings from an increased overall network capacity and availability, but there are also time savings from the reduced operational load required to manage and secure the network

locations and devices. SD-WAN enhances security by integrating advanced features such as endto-end encryption and firewalls. These measures ensure that data remains protected regardless of where employees are connecting from.

Real world success

Numerous organisations have already reaped the benefits of SD-WAN as part of their hybrid work strategies. By switching to SD-WAN, NHS leaders who Virgin Media O2 Business spoke with were able to experience, on average:

- 139% more available bandwidth
- 61% less time troubleshooting issues and fewer security incidents
- 70% more network visibility

As a result, those NHS trusts were able to ensure their systems were more resilient to cyber threats across multiple sites, identifying faults before they could impact staff and patients. By bringing staff closer to the apps and data they need, SD-WAN helped increase staff productivity. It also allowed NHS leaders to provide a more reliable service to patients, prioritising their care.

The path forward

As the hybrid work model continues to evolve, resilient and flexible networking solutions will become increasingly critical.

SD-WAN empowers large businesses to fully embrace the future of work. By helping drive efficiencies, cost savings, and simplifying network management, it acts as a key stepping stone towards a fully digital culture. A culture that embraces emerging technology trends, where employees are not only engaged with new tech but are also ready to use it to tackle their work from anywhere.

How to prepare your data and infrastructure for AI

The potential for AI to revolutionise operations, streamline processes, and boost efficiency is undeniable for businesses of all sizes. AI is dominating headlines and is a hot topic in businesses across the UK who are seeking to deploy AI solutions at speed to maintain their competitive edge.

BY FRANCESCA COLENSO, DIRECTOR OF AZURE BUSINESS GROUP AT MICROSOFT UK



IN FACT, a recent Gartner poll found 55% of organisations are in piloting or production Mode with generative AI. Meanwhile, more than half of organisations have increased generative AI investment in the last 10 months. This raises alarm bells. Diving headfirst into AI deployment without proper preparation can lead to complications, limited return on investment, and frustrated stakeholders.

It is critical to do the right prep work. If you're still at this stage, there are two key areas you need to focus on initially: data and infrastructure. Start with your data.

Data is the lifeblood of Al. Having a deep understanding of your data gives you a significant advantage. Al thrives on large, high-quality datasets, which generally improve its accuracy and effectiveness. However, embarking on your Al journey without properly preparing your data can lead to a number of challenges:



- Insufficient or poor-quality data: This can lead to inaccurate or misleading results from your Al models.
- Outdated systems: Legacy systems may not be able to manage the volume, variety, and velocity of data required for Al.
- Unexpected costs: The cost of acquiring, storing, and processing large datasets can be significant if not planned for properly.

Fortunately, there are various data preparation tools available on the market that can help you cleanse, transform, and structure your data while reducing costs and simplifying your setup.

A holistic approach to data management

Once you have sorted and organised your data how do you keep it that way? Establishing a robust data management process is crucial for successful Al implementation. Traditionally, data management and infrastructure have been viewed as separate initiatives, each with its own set of priorities. However, AI necessitates a more holistic approach. A strong data management process ensures that the data feeding your AI models is clean, relevant, and well-organised. This comprehensive approach involves not only efficient storage and organisation but also guaranteeing data guality, security, and compliance. Collaboration between data engineers, data scientists, IT professionals, and business stakeholders is essential for defining and implementing best practices for data collection, storage, processing, and governance.

By integrating data management seamlessly into your AI initiatives, you create a solid foundation for building and deploying powerful AI solutions. With clean, reliable data at your fingertips, you can unlock the full potential of AI and transform your ideas into tangible realities.



Building the right infrastructure

Unfortunately, data is only half of the equation. To truly be Al-ready, businesses must invest in solid digital infrastructure. What does this mean? Think of Al like a jigsaw. Data is the puzzle pieces you're trying to assemble, and infrastructure is the table or surface where the puzzle is built. Therefore, the initial question you need to answer is where the puzzle pieces will be put together.

Many businesses are opting for a cloud-first approach, which can help with reduced expenditure, regular new innovations, and generalised access to advanced tools. Alternatively, some businesses may choose to build and maintain their own onpremises infrastructure – potentially for reasons such as data security or regulatory compliance. Or, for some, a hybrid approach works best, which combines elements of both cloud and on-premises infrastructure, offering a balance of flexibility, security, and control. The preferred approach will differ from one business to another, but the main goal is to find an infrastructure set-up which can be adaptive to your long-term needs.

Once you've decided on your infrastructure at large, the next step is to navigate the vast landscape of tools and resources available to businesses. Broadly, these could include:

- Pre-trained models: These are pre-built Al models that have already been trained on a massive dataset for a specific task, such as image recognition, natural language processing, or machine translation. They are like pre-made components that developers can leverage in their applications to save time and resources compared to training a model from scratch.
- Customisable frameworks: These are software platforms that give you the foundation for building and using your own AI models They provide all sorts of tools and features that developers can use to tweak their models and make sure they fit their project's needs. Imagine them as construction sets with different bits and pieces (functions, algorithms) that can be put together in different ways to build different

structures (AI models) that are right for you.

- Open-source libraries: These are a bit like free code recipe books that developers can rummage through, modify, and use in their projects. They are a brilliant resource, letting developers benefit from other people's knowledge and work, saving them time and hassle when making their own AI solutions.
- Low-code/no-code platforms: Low-code and no-code platforms are revolutionising the way software is built. They offer a visual way to design and develop applications, with little to no traditional coding required. They enable rapid deployment, empower people without a coding background to build tools and solve the problems they are facing, and reduce the burden on IT.

Once you understand your needs, it's essential to understand how readily they can integrate with your data and infrastructure. This can be a challenging task for organisations with complex and fragmented data environments that have evolved over time. However, there are solutions available that provide a unified platform and the tools you need to simplify data integration and streamline operations. Remember: think broadly and long-term about your goals, and don't be restricted by your existing tools or infrastructure.

Hastings Direct is a great example of a company that has successfully migrated to the cloud (in their case, Azure VMware Solution) to enable AI to supercharge their operations. By investing in data and infrastructure, Hastings Direct boosted their application performance by 1.6 times, allowing them to adjust customer quotes four to five times faster and gain a market edge. This is just one example of how companies can benefit from sufficiently preparing their business to deploy AI models.

The transformative potential of AI is clear for businesses of all sizes. Businesses just need to make sure they're investing in data and infrastructure ahead of time if they want to truly realise AI's potential and drive real innovation, efficiency, and growth.

Beating the data barrage

Artificial Intelligence and AIOps may be the key to understanding today's world of exploding data.

BY KEVIN KLINE, SOLARWINDS DATABASE TECHNOLOGY EVANGELIST



THE LIBRARY OF BABEI — a short story by Jorge Luis Borges published in 1941 — might not be on everyone's reading list. Nor is it likely to make the bestseller chart any time soon. But it does have a bit of a following, especially among those interested in computer science and information theory.

For those not familiar with the story, it's set in a vast and infinite library that contains every possible combination of letters and punctuation marks.

As such, it contains a library of unimaginable size — stacked with every possible book possible with a near-infinite combination — and includes those filled with gibberish to those containing every meaningful piece of literature ever written.

Faced with so much information, it's up to the librarians to find the book that contains life's true and complete meaning. Faced with so much information, it's no wonder the librarians of Babel started to go mad.

While the story raises questions about the pursuit of knowledge, the nature of truth, and the human desire to find meaning in an overwhelming and chaotic world, it holds something more cerebral for computer scientists.

> For them, the Library of Babel touches on concepts such as infinite data storage, algorithmic search and retrieval, data compression, and meaningful data's importance.

Sorting and managing data is a life's work

If you think the link is a tad tenuous, imagine if the letters and punctuation in the library were, instead, an everexpanding collection of ones and zeros — the language not of words, but of computing.

Each unique combination would represent something different — an application, a photograph, a song, a contract, a book. Think of it that way and the combinations are endless.



That's why computer scientists hold the short story in such high regard. Faced with this never-ending flow of data, how do they — computer scientists, not librarians — manage, process and store such a mind-boggling amount of information every day? Where do they even start?

Thankfully, unlike Babel's characters painstakingly going through each book by hand, at least computer scientists can use tools to help them get the job done. And in today's world, increasingly that means using artificial intelligence (AI) and machine learning (ML).

How AI and ML are transforming IT

Al and ML are powerful solutions helping to transform how IT professionals manage and analyse data to optimise performance, improve business outcomes, and mitigate security risks. By automating such tasks, these technologies are able to crunch massive amounts of data that would otherwise be impossible to process by hand.

And when you consider real-world computing environments, the need for AI and ML becomes even more acute since many computer systems run in multiple clouds and rely on hundreds of applications to get work done.

In the real world, it is only with AI and ML doing the heavy lifting that these systems can predict and prevent application or system crashes or outages. How? By engaging in constant system surveillance and automatically analysing key performance metrics.

Again, there is an analogy here with the library. Imagine being one of the librarians tasked with reading all the books to find that one elusive tome. Now, imagine the difference it would make to your workload if you had a virtual assistant that was able to read and analyse all the books for you.

This would free you up to look at only those books that were flagged to be of interest. And if the automation of the process left you twiddling your thumbs, you could decide to do something else. Such as redecorating the breakroom. Or simply leave the confines of the bibliotheque and, instead, enjoy a walk in the sunshine.

Al and ML on their own are not enough

Of course, AI and ML aren't a solution in their own right. Despite their ability to sift through and make sense of huge amounts of data, they need to operate within a framework to make them operational. This is where Artificial Intelligence for IT Operations — or AIOps — comes in.

It's a technology practice that combines AI and ML with traditional IT operations to enhance and automate various aspects of managing and monitoring IT systems and infrastructure. Although it's a relatively new term, the role of AIOps is to improve the efficiency, agility, and reliability of AlOps enables IT teams to gain end-toend visibility – regardless of a company's infrastructure or where they may be on their digital transformation journey – and reduce the time spent troubleshooting while improving system reliability

IT operations. How? By leveraging AI and ML by analysing data, detecting patterns, making predictions, and automating routine tasks.

AlOps is particularly valuable in complex and dynamic IT environments, such as cloud-based systems, microservices architectures, and hybrid infrastructures, where traditional monitoring and management approaches may struggle to keep pace with the scale and complexity of modern technology ecosystems.

It also helps IT teams streamline their operations, reduce downtime, and deliver a more reliable and responsive IT service to users and customers.

AlOps enables IT teams to gain end-to-end visibility – regardless of a company's infrastructure or where they may be on their digital transformation journey – and reduce the time spent troubleshooting while improving system reliability.

And that's important because the explosion of data presents significant challenges for IT pros related to managing and analysing today's complicated IT environments.

The good news, though, is that AI, ML, and AIOps are transforming how IT professionals work, enabling them to automate tasks, detect security threats, optimise performance, and make better decisions based on data analysis.

However, the use of AI, ML and AIOps is not a green light for complete and total automation. Organisations looking to implement these tools must make sure that someone — a person — is able to set the parameters and provide the necessary oversight.

Touch in on the scenario posed in the Library of Babel, although Al tools could search through every possible book far faster than a human could, they still wouldn't be able to "think" for themselves like humans can – a critically important element.

AlOps isn't a replacement for the work needing to be done. It's an aid to understanding the barrage of information we receive each and every day.

Is a passwordless future a more **secure future**?



Given that poor password hygiene and the resulting impact can damage an organisation's reputation beyond repair, companies need to treat this situation with the level of seriousness it demands.

BY MUHAMMAD YAHAYA PATEL, SECURITY ENGINEER AT CHECK POINT SOFTWARE

FOLLOWING THE NEWS that the UK has introduced the worlds-first law banning weak passwords, minimum security standards must now be enforced by manufacturers of all internet connected devices. The Telecommunications (Security) Act mandates stricter cybersecurity measures for smart devices to protect consumers. Manufacturers are now required to eliminate default passwords, establish a security issue reporting point of contact for consumers and disclose the minimum duration for which the device will receive important security updates. While this legislation is a step in the right direction, it begs the questions, what can we do to better secure our first line of defence?

Username

Login

member M

The perils of poor password hygiene

Password negligence has far-reaching implications, especially for businesses. With over 23 million people using simplistic passwords like '123456', the stakes are alarmingly high. Such lax security can unravel an organisation, leading to data breaches, ransom demands, and irreparable damage to customer trust. In fact, just a single weak password can open the floodgates to wide-ranging cyberattacks. For instance, recent attacks on major organisations like Okta and 23AndMe were facilitated by stolen login details, demonstrating the widespread impact and ongoing threat posed by weak password practices.

From phishing exploits to brute-force attacks, the techniques used by cybercriminals are evolving. With advancements in AI, hackers now harness machine learning algorithms to predict and crack passwords more swiftly than ever, exploiting every chink in our digital armour. This escalation in attack capability necessitates the adoption of passwords that are not only longer, but also more complex.

The possibility of a passwordless future

The role of traditional passwords amidst the advent of biometric authentication is a subject of lively debate among security experts. While some advocate for completely abandoning passwords in favour of biometric solutions – such as fingerprints or FaceID – and modern alternatives like Google Passkey for their convenience and enhanced security, others support the continued use of password managers or a combination of methods. Despite advances in authentication technology, traditional passwords remain prevalent across various platforms.

Biometric authentication, while secure, has a significant drawback: once compromised, biometric data cannot be changed. This vulnerability can lead to irreversible identity theft. In contrast, traditional passwords can be frequently updated to prevent unauthorised access following a security breach. Furthermore, many individuals and industries still depend on passwords to access critical services, such as email and personal accounts.

However, there is a noticeable shift toward passwordless authentication, especially in sectors with rigorous security needs like banking and corporate communications. This shift includes the adoption of hardware tokens, multi-factor authentication using alternate devices, and one-time verification pins, offering secure access without traditional passwords.

Remove reliance on passwords

Executives need to enact and enforce good cybersecurity practices. The best way to do that is to reduce the reliance you have on passwords alone. This means organisations need to adopt other authentication methods to reduce the chances of becoming overwhelmed. For example, by combining multiple account protection solutions such as twofactor authentication with biometrics, you will lower the chances of a successful attack while at the same time, helping to improve the overall security posture in your organisation.

Businesses could also consider using Single Sign-On (SSO), which allows a user to authenticate themselves on multiple, separate platforms via a single ID. This solution negates the need for several different passwords. There is an element of risk, but by combining SSO with multi-factor authentication you can add a second layer of protection.

Essential password hygiene

To strengthen password security, I would recommend the following best practices:

• Complexity and length: Create passwords with a mix of numbers, letters, and symbols, aiming for 12-16 characters to enhance security. Ensure the password is unique to you and avoid using easily guessed personal details like birthdays or anniversaries.

- Unique passwords for different accounts: Avoid reusing passwords across multiple platforms. Use memorable phrases or sentences, like 'meryhadalittlelamb', or a more secure variant with special characters '#M3ryHad@L1ttleL4m8'. There are solutions available that prevent the reuse of corporate passwords on external sites and protecting against phishing and malware.
- Use a password manager: Sometimes having a password is a mandatory requirement, so you cannot rely on other authentication methods alone. Conduct an evaluation to decide if a password manager would be appropriate for your organisation. Password managers have several benefits. They allow your employees to securely store credentials, generate unique passwords and they can auto-complete fields on websites. This removes the reliance on remembering hundreds of passwords or writing them down for anyone to see.
- Implement security tools to prevent credential harvesting: Always enable MFA to add an additional layer of security. This ensures that even if a password is compromised, unauthorised access is still blocked. Employ encryption protocols to safeguard sensitive data during transmission. Regularly update and patch software to mitigate vulnerabilities that could be exploited by cyberattacks. Additionally, educate users on recognising phishing attempts. By proactively integrating these security measures, you fortify your defences against credential harvesting and enhance the overall security posture of your online presence.
- Implement an account monitoring solution: You can only protect what you can see, so it's important that you have visibility of all accounts that have been compromised by an attack. Otherwise, how are you going to make improvements to stop an attack from happening again? This is why you need to review the default account settings and turn on features like locking an account after certain attempts. You don't want an attacker to have unlimited time or an unlimited number of login attempts, allowing them to force their way into your organisation.

By adhering to these guidelines, individuals and organisations can significantly enhance their digital security posture.

The takeaway

In the current cyber environment, an attack is inevitable. However, preventing an attack is possible with the right combination of technologies and security protocols. Put simply, action must be taken now to keep your accounts safe. Given that poor password hygiene and the resulting impact can damage an organisation's reputation beyond repair, companies need to treat this situation with the level of seriousness it demands.



Data security best practices for today's distributed enterprises

In today's digital landscape, where every day seems to bring yet another alarming headline about a data breach, the need to safeguard sensitive information has never been more important for enterprises and government agencies.

BY ERIK SCORALICK, SENIOR MANAGER, SALES ENGINEERING AT FORCEPOINT

AS ORGANISATIONS increasingly rely on a multitude of platforms to store and channels to transmit data, the importance of prioritizing robust data security is paramount. The reality of this seemingly endless news cycle is that so many of these breaches are preventable with the right strategy in place.

Unfortunately, security solutions have struggled to keep pace with this ever-expanding data ecosystem, leaving companies vulnerable to potential breaches and regulatory compliance risks.



Amidst a seemingly daunting array of threats lies an opportunity presented by the cutting-edge technologies available to us now. It is imperative that the approach adopted by organizations is guided by a commitment to empower the whole company with the knowledge and tools necessary to navigate the complex landscape of cybersecurity threats effectively.

Best practices to consider

There are several data security best practices that enterprises can consider bolster their defences against potential breaches. From employee awareness training to cloud visibility and control, endpoint and BYOD protection, data security handling policy, certain steps are designed as a businesses first defence in addressing the most common vulnerabilities they face today.

Employee awareness training is the essential foundation for ensuring that teams understand the risks associated with unmanaged devices and know how to securely grant access to sensitive data. However, regardless of capabilities, you can't protect what you can't see. With the sheer amount of data that organizations hold today, manual discovery and classification presents a challenge as the data today is not the same amount of data tomorrow. Data discovery and classification is a critical component of any effective security strategy – enabling organizations to identify and protect their most valuable assets.

Artificial intelligence can help level the playing field through automation to increase confidence level content detection, enabling organizations to run continuous data discovery with highly accurate classification as time goes on.

This brings us to the importance of considering innovative solutions such as Data Security Posture Management (DSPM) to deliver real-time visibility with pre-built data models to identify different types of documents (business documents, technical documents, HR documents, financial documents), but also classify if a file is either public or highly confidential, ease privacy compliance and minimize risks for data stored across multiple environments including laaS, SaaS. Integrating DSPM with Data Loss Prevention (DLP) and Risk Adaptive Protection (RAP) capabilities into a unified data security solution can truly be a stepping stone to achieving data security everywhere, and a full data lifecycle management (discovering, classifying, prioritizing, protecting and monitoring sensitive data).

Unifying policy coverage can further help maintain compliance with regional and industry-specific regulations. Using pre-built data security policies and unifying coverage in the cloud, endpoint and unmanaged devices further yields time savings from not having to painstakingly configure each policy for compliance.

Protecting users across platforms

Organizations and government agencies must remain vigilant in monitoring insider threats, which can pose a significant risk to data security. With the rise of remote work and the increasing use of cloud-based applications, the threat landscape has become more complex than ever before. By implementing real-time monitoring and policy Artificial intelligence can help level the playing field through automation to increase confidence level content detection, enabling organizations to run continuous data discovery with highly accurate classification as time goes on

adjustments, organizations can stay one step ahead of potential threats and protect their sensitive data from unauthorized access.

Security incidents stemming from insider threats could be purposeful or accidental. Real-time adaptive policies help enterprises stay one step ahead of their employees with real-time policy adjustments that can be set to self-educate users who make a mistake or block more nefarious threat actors. Adaptive policies empower businesses to achieve success by enabling flexible data security controls. This allows for one-to-one policy assignment (rather than one-to-many), where each user's risk score determines their specific security controls.

The need for robust data security measures has never been more apparent. And while there has never been more urgency to safeguard sensitive information, there has also never been a more opportune time for it. Cutting-edge technologies make sound data security best practices easy to implement and maintain – and when done right, without impacting employee productivity. By implementing best practices and leveraging the latest technologies, organizations can ensure that their sensitive information remains protected from potential breaches and regulatory compliance risks.



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CLOUD

The state of the IT nation

CIOs seek multicloud, freedom of data movement and protection from ransomware

BY SAMMY ZOGHLAMI, SVP EMEA, NUTANIX



WHAT DO DevOps and platform engineering decision-makers want from 2024, what do they fear and what will they invest in? A single-sentence answer may be that they want to innovate, they fear data protection infringements and they will invest in modernisation, security and Al.

The spectre of ransomware

Let's start with threats. According to Nutanix's sixth annual Enterprise Cloud Index, ransomware/ malware is the biggest application and data management challenge faced by the 1,500 global respondents surveyed. More than four (42%) in 10 said they saw protecting against these dual menaces as a significant challenge. This comes as no surprise: ransomware strikes terror into the hearts of not just IT staff but senior executives who understand the potential damage to finances, reputation and morale.

Ransomware presents a bigger threat than ever, taking key services offline and effectively holding the corporate target hostage. The payload can be huge, with 71% of respondents that had been



attacked taking days or even weeks to restore optimal operations.

Little wonder, then, that 78% plot protective solutions. Many are turning to new approaches that go beyond backup, by creating a real-time monitoring environment and an effective data support net so that organisations can revert to a fully functioning state within a guarter of an hour of an attack.

Jumping between clouds

So, what about positives? The good news is that organisations appear to be taking a pragmatic stance on IT deployment. Today, only outliers aren't progressing with some form of hybrid model and a hybrid multicloud model with a very wide spread of models is increasingly preferred. This lets CIOs pursue a 'horses for courses' approach where workloads meet a good fit for IT platforms, whether they be cloud, edge, onpremises datacentre, hosting or some combination of these. Fully 90% of the panel said they are adopting a "cloud smart" position and the proportion of respondents expecting to move to hybrid multicloud is set to double inside three years to 35% of respondents.

Hybrid multicloud is seen as the way forward to desired business outcomes such as ultimate flexibility, performance, security, dynamic data services (such as backup and snapshotting), data sovereignty, AI sustainability and cost management. Given the breadth of applications, workloads and needs, interoperability and a holistic overview of provisioning controls will be critical here to ensure value, prevent against data loss and avoid redundancy of operations.

The ideal state is a fully motile environment where cloud orchestration makes it easy to switch workloads and applications across platforms as needs dictate. Almost all respondents (95%) said they had crossed workload platforms in the past year. Why? Because IT and the businesses they

serve need to be able to bolster security and switch on innovation at different times as needs dictate. This is more than ever the case because the commercial environment is so hard to read.

Conflicts, geopolitics and elections, a febrile economy, the drive towards net-zero and continuing globalisation mean that organisations need to be able to switch product offers, re-engineer value chains, price dynamically, switch channels and go to market in new ways, and to expand and contract IT services on the fly. Only by having an optimally adaptive technology platform can they do this. Databases provide a case in point. Database workloads are often moved but managing databases across deployment platforms was cited as the number-one category challenge faced by respondents. The answer here is a control plane that lets these stores be easily transitioned regardless of platform or vendor. But nobody said this was easy: 35% stated that workload and application migration are being hobbled by current IT infrastructure obstacles.

Modernise to move up

Modernising infrastructure is seen as a route to that desired ultra-flexible state and enjoying a fast track to adopt growth technologies such as Al. Today, over a third (37%) say that running Al applications on current-state infrastructure will be a challenge. By refining everywhere, including the network edge, organisations give themselves the best possible chance of capitalising on the march of new technologies and shining a light and creating visibility into data wherever it resides. Many say they are modernising to innovate while others are seeking increased visibility into data assets and sovereignty to support good governance. However, modernisation today is far from a done deal. Take containers, for example, where just 4% of respondents said all their applications were containerised and 35% said fewer than half of apps are containerised.

IT is part of the sustainability mandate

The global drive towards sustainability is reflected in this survey with almost all respondents (98%) saying their organisations support some sort of relevant initiatives. This is a fast-moving space with 51% of organisations saying they have improved their ability to detect areas for cutting waste and 44% saying they had improved their ability to see greenhouse gas and carbon emissions. More than half (52%) have modernised IT to improve sustainability records but there is clearly scope to do much more. So, in brief, this is IT in 2024. Leaders need to drive forward across initiatives and are clearly minded to cut out silos and make their estates more manageable and flexible. Achieving these aims will need investment, bold plans and management rigour. Next year's report should provide an update as to how far our respondents have succeeded.



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Leadership 4.0:

The tech-powered way in the modern working world



The digital revolution has fundamentally reshaped the business landscape. Traditional leadership styles, characterised by rigid hierarchies and topdown decision-making, are proving increasingly ineffective in this dynamic environment. To thrive in the age of constant disruption, a new leadership paradigm is emerging... Leadership 4.0.

BY DAVID MALAN, SALES DIRECTOR, UK AND IRELAND, DOCUWARE

LEADERSHIP 4.0 reflects the realities of Industry 4.0, a world marked by interconnectedness, <u>automation</u> and the influence of exciting technologies such as artificial intelligence (AI). This leadership style prioritises agility, collaboration and a focus on human potential. Leaders in this new era act as facilitators and coaches, empowering teams to innovate and solve problems collectively.

Building a culture of collaboration

Leadership 4.0 relies on effective technology integration. Leaders must carefully evaluate and implement the tools that support collaboration, communication and knowledge management. Cloud-based platforms can facilitate real-time communication, project management and knowledge sharing, regardless of location. Data analysis, powered by big data and analytics tools, provides valuable insights into everything from customer behaviour and market trends to team performance. This empowers leaders to make datadriven decisions, optimise processes and ultimately achieve better results.

A Document Management System

(DMS) centralises document storage, streamlines workflows and facilitates secure information sharing. This is ever so important for fostering transparency and collaboration within an organisation.

While technology is a powerful driver of Leadership 4.0, the human element remains irreplaceable. Leaders must remember that AI and automation tools are there to augment human capabilities, not replace them. The human touch is essential for tasks that require creativity, critical thinking, complex problem-solving and emotional intelligence. Business leaders play a vital role in fostering a culture of human-machine collaboration, where technology empowers employees to work smarter and achieve better results. Additionally, soft skills like empathy, effective communication and the ability to build trust are crucial for motivating and inspiring teams in a dynamic and ever-changing working environment.

Redefining success in the workplace

At the heart of Leadership 4.0 lies a shift towards networked thinking and action. Information silos are broken down and replaced by a culture of collaboration that transcends traditional departmental boundaries, from sales and marketing, to IT and finance. Teams can use new tech tools to work together seamlessly and achieve shared goals and allow information to flow as needed across an organisation.

Agility and adaptability are paramount for modern businesses. Leaders must be able to react swiftly to changing market conditions and customer demands. This requires a willingness to experiment, embrace new technologies and continuously learn. Leaders must foster a culture of innovation and encourage calculated risks to stay ahead of the curve.

Empowerment and participation are central to Leadership 4.0. Employees are encouraged to take ownership of their work and actively participate in decision-making processes. This fosters a sense of responsibility and ownership, motivation and increased engagement. When employees feel valued and heard, they are more likely to contribute their best work, leading to a more positive and successful work environment for all. Embracing a digital transformation Leaders must champion the development of digital literacy within their teams to ensure everyone can leverage the power of new tools and platforms. Building digital skills empowers employees and allows them to excel in the ever-evolving digital age. While Leadership 4.0 offers significant advantages, there are also challenges to consider. Traditional mindsets can create resistance to new leadership styles. Therefore, business leaders must be adept at communication, persuasion and change management to navigate this challenge.

Shifting to a culture of openness, collaboration and transparency may require significant cultural change within an organisation. Technology that replaces repetitive manual tasks can be hard for some employees to trust. In geographically dispersed teams, maintaining clear communication can be a hurdle. Leaders must prioritise tech tools that enable effective communication across teams, departments and borders.

The road to Leadership 4.0 is an exciting one, If you're looking to empower your teams, embrace innovation and thrive in the digital age, we're here to help. <u>At</u> <u>DocuWare</u>, we offer technology solutions designed to support Leadership 4.0 principles. <u>Whether you need to bolster</u> <u>collaboration with cloud-based platforms,</u> <u>leverage data insights for better</u> <u>decision-making or streamline workflows</u> <u>across your organisation</u>, we have the tools and expertise to empower your transformation.

<u>Contact us today</u> to schedule a consultation and explore how we can help you unlock the full potential of Leadership 4.0 in your organisation.

DCA news and updates

10x10

BY STEVE HONE, CEO, THE DCA

Ca)The

data centre

trade association

THIS MONTH Data Centre Solutions editorial theme has a number of topics Edge, 5G and Energy Efficiency. The DCA have chosen to focus on Energy Efficiency. We have three articles from DCA Partners. I'd like to thank EnerSys, Carbon 3IT and Enel X (along with Digital Realty) for taking the time to write these articles which I hope you will find them interesting.

Michael Sagar, Direct of Marketing Energy Systems, Enersys provides an informative piece titled – 'Unlocking the Potential: Data Center Energy Storage's Dual Function in Backup and Grid Balancing'. Michael's article explores how data centre energy storage can play a dual role in backup and grid balancing, not only ensuring customer data integrity but also facilitating the clean energy transition, lowering the overall carbon footprint.

John Booth, MD Carbon3IT & Chair DCA Energy Efficiency SIG has spent time considering AI and Data Centres - 'Beware the AI'ds of March (The Ides of March)' – John points out that AI is THE dominant topic at most of the data centres events he's attended recently. His observation - AI, is taking over all rational thought and perhaps we should all take a deep breath, and consider what we are doing...

John Byrne, Managing Director – Ireland, Enel X, and Evan Barker, Manager - Facilities Engineering, Digital Realty have collaborated, producing an article that relates to how leveraging the flexibility of data centre UPS through Enel X and Digital Realty's award-winning collaboration avoids over 30,000 tonnes of CO2 emissions and supports Ireland's renewable energy transition. 'Grid-interactive UPS – How data centres can actively enable Ireland's renewable energy transition'.





The DCA's - Data Centre Transformation 2024 22 October 2024 at The IET, Birmingham

The event comprises of panel sessions, workshops and updates from Government and Industry Experts. The conference programme starts at 10.00am and finishes at 17.00pm, followed by informal networking drinks and The DCA Dinner. All DCA Members and Partners are welcome at DCT along anyone else who has an interest in the Data Centre Industry.

Don't miss this fantastic one-day event! Click here to register for Data Centre Transformation 2024!

To find out more information about The DCA click here or email us mss@dca-global.org

Unlocking the potential: Data center energy storage's dual function in backup and grid balancing



By Michael Sagar, Director of Marketing, Energy Systems - EnerSys®

IN THE NEAR FUTURE, the global energy landscape is poised to shift dramatically, with a reduced reliance on fossil fuels. The <u>COP27 UN Climate</u> <u>Change</u> conference saw nearly 200 countries reaffirm their commitment to limit global temperature to rise to 1.5°C (2.7°F) above pre-industrial levels.

However, the world is perilously off course to keep this limit within reach and a bleak report published by the <u>UN Climate Change</u> shows current

pledges put us on track for a 2.5°C (4.5°F) rise by the end of the century. With the seriousness of the environmental threats the world faces, there is a heightened emphasis on replacing fossil-fuel generated electricity with renewable energy sources like wind and solar power. However, the intermittent nature of these sources poses a significant challenge when it comes to integrating them into the existing power grid infrastructure.







> Data center operators have, historically, been unable to adopt grid balancing This article explores how data center energy storage can play a dual role in backup and grid balancing, not only ensuring customer data integrity but also facilitating the clean energy transition, thereby lowering the overall carbon footprint.

Emerging trends in the energy sector

Accelerating solar and wind generation site additions are driving the growth in renewable energy supply. According to the <u>International</u> <u>Environment Agency (IEA)</u> 2022 was a record year for renewable capacity additions and is expected to jump by a third in 2023.

Nevertheless, this activity needs to ramp up sharply to align with the <u>Net Zero Emissions by 2050 (NZE)</u> <u>Scenario</u>. In the run-up to COP28 taking place at the end of 2023, the IEA is preparing its '<u>Tracking Clean</u> <u>Energy Progress 2023</u>' report, which supports the first global review of the <u>Paris Agreement</u>.

Challenges in renewable energy generation

Unlike traditional power stations, which can readily



> EnerSys® TPPL battery technology stacks deployed within a data center

scale up generation to meet demand, renewable sources like solar and wind are inherently variable and depend on local environmental conditions. This unpredictability, coupled with daily and seasonal fluctuations, poses challenges for maintaining a stable grid when demand surges. As the energy landscape shifts towards greater reliance on intermittent renewables, strategies should be developed to augment power output when necessary to ensure grid stability.

Ensuring grid stability

Grid stability hinges on maintaining a consistent grid frequency, which varies between regions (e.g., 60Hz in the US and 50Hz in the EU). Even small deviations from the standard frequency can lead to power outages. Grid balancing technology is crucial for maintaining the optimal frequency by tapping into stored energy reserves during peak demand and charging these reserves when there is excess energy available.

Data centers as potential grid balancers

Data center operators typically possess substantial energy storage capacity, often underutilized. In some areas, operators are exploring ways to repurpose this capacity for grid balancing. By reallocating battery units from Uninterruptible Power Supply (UPS) systems, data centers can contribute to grid stability and potentially generate additional revenue.

Developing a grid-balancing strategy

Data center operators considering grid balancing must carefully weigh their options. They can choose to take full control of the process, engaging with electricity distribution companies, making the necessary investments, and overseeing maintenance. Alternatively, they may opt to delegate the grid balancing work to the electricity service provider, which would capture most of the revenue. Hybrid approaches that strike a balance between risk and revenue are also viable. However, data center operators must prioritize the continuity of their core functions. Any strategy for grid balancing should not compromise backup power supply responsibilities, as service interruptions can have catastrophic consequences.

Selecting the right battery chemistry

Grid balancing activities require a robust energy storage reserve, but data center operators should consider the Total Cost of Ownership (TCO) and management expenses against potential revenue. Traditional lead-acid batteries were insufficient for the task, but advancements in battery technology have made grid balancing feasible. Batteries with strong charge/recharge durability and suitability for high cyclic requirements are vital for grid balancing. Advanced technology lead-acid batteries, with their elevated energy density, charge cycle endurance, and cost-effectiveness, are a popular choice enabling data center operators to actively participate in the concerted effort to maximize

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grid resilience. EnerSys® has been driving innovation in lead-acid battery technology. The company's advanced thin plate pure lead (TPPL) battery technology significantly boosts leadacid performance, extends lifespan, and offers high cyclic capabilities, making it ideal for grid balancing. These batteries can operate efficiently at higher temperatures, reducing cooling costs and environmental impact.

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However, elevated operating temperatures will reduce the battery's service life, leading to earlier replacement. It is important, therefore, for an operator to fully consider the implications and speak with experts before exploring this option.

Grid balancing for a sustainable energy future

As the transition to renewable energy accelerates, maintaining a stable grid is paramount. Data center operators can have a crucial role to play in grid balancing. By selecting the right battery chemistry and partnering with reliable vendors like EnerSys®, operators can seize the opportunities presented by grid balancing. With appropriate guidance, operators can make informed decisions about the potential capital and operational costs versus revenue. This strategic approach will empower data centers to contribute to grid stability and maximize their energy storage assets while optimizing their operations.

Beware the Al'ds of March (The Ides of March)

By John Booth, DCA Energy Efficiency SIG & MD Carbon3IT

THE IDES IS THE DAY on the Roman calendar to indicate roughly the midpoint of the month it is usually the 15th, the Ides of March became famous as the date of Julius Caesar was assinated in 44BC. According to Plutarch, a seer had warned that harm would come to Caesar on the Ides of March. Enroute to the Senate, Caesar has passed the seer and joked "well, the Ides of March are come", implying that the prohecy had not been fulfilled, to which the seer relied, "Aye, they are come, but they are not yet gone"

"Julius Caesar was assassinated by a group of senators on the Ides of March (15 March) of 44 BC during a meeting of the Senate at the Curia of Pompey of the Theatre of Pompey in Rome where the senators stabbed Caesar 23 times. They claimed to be acting over fears that Caesar's unprecedented concentration of power during his dictatorship was undermining the Roman Republic. At least 60 to 70 senators were party to the conspiracy, led by Marcus Junius Brutus, Gaius Cassius Longinus, and Decimus Junius Brutus Albinus."

Source: Wikepedia, accessed 7th May 2024 <u>https://</u> en.wikipedia.org/wiki/Assassination_of_Julius_ <u>Caesar</u>

You may wonder where I am going with this, but AI and its impact on the data centre sector appears to me to be "an unprecendented concentration of power" it, AI, is taking over all rational thought and perhaps we should all take a deep breath, and consider what we are doing...

The dominant topic at the recent data centres events that I've attended is AI.

It is top of a list compiled by Simmons and Simmons https://www.simmons-simmons.com/en/publications/ cluuzeox800hyuatcw3kkq0xs/top-10-issues-indata-centres published on the 11th April 2024, the "The Impact of AI on Data Centres" and has links to number 3 on the list "Balancing Net Zero with human need" and 4 Critical Infrastructures for powering data centres, as well as 8 "Supply chain challenges" and 9 "Lack of Skilled labour in the industry".



But, are we sure about AI?

Personally, I'm not convinced that AI will turn out to be the pancea that some are saying, yes, its good for healthcare and for analysis of geo-data which can be used to determine where and what we should consider for adaptation and mitigation of climate change, I'll even go so far as to say that it can eliminate errors and optimise production lines, but you could do that with sigma six and kaizen methods. The darker side of AI is fake news, outright disinformation and deep fakes, and I am not convinced that enough is being done from a legislative or self-regulatory point of view to address these issues.

From a data centre perspective, it appears to be "technology for technology's sake", AI chips use more power and thus require more cooling, a recent conversation revealed that one of the major players in the space have advised a power/cooling global manufacturer to prepare for 500kw racks.

Its clear that legacy data centres will not and cannot provide the infratructure to support this path, meaning that Al will have to be located in "state of the art" data centres, which will take at least 3 years to build, even if we had a design ready to go, which we dont, so perhaps longer. Add to that the lack of power in the traditional data centre hubs and the question really is, where are we going to put them, and thats to assume that we'll be able to obtain the vast amounts of power required. One area could be the Nordics, to take advantage of renewable energy and a suitable climate, but if we were to deploy at







scale, what could happen to the micro-climate, could we be accelerating global warming by locating heat producing data centres in the very areas that are at risk from climate change?

Nukes?

Some Al'ers have even cited the use of Nuclear power to address the power problems, primarily the use of Small Modular Reactors (SMR's) located within the data centre itself! It might happen in the US, but I doubt very much it will happen in the EU/UK for a host of reasons, the first is cost, access to fuels, cost, security, additional infrastructure adding to the cost, NIMBYism, Nuclear Free cities policies, cost, and timescales, the decision for SMRs in the UK will not be taken until 2029 and realistically the first working reactor some time after, an example is Hinkley Point C, projections indicate double the original cost and over 4 years later to start generating.

Issues

Over the weekend, (5 May 2024) there was a press report covering the disgruntlement of locals adjacent to a large hyperscale build in Waltham Forest on the outskirts of London, true, this was more to do with the construction of the data centre rather than the operation, but we are already seeing local communities moaning about new builds in Ireland, Netherlands, US, with moratoriums in place

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It clear to see that we will have resistance to building in the future.

Regulations

Returning to the Simmons & Simmons list, the 2nd topic was "Regulatory compliance in the drive to Net Zero", alarmed by the explosive forecasted growth as far back as 2008 (well before AI was even a thing) in data centres, the EU created the EU Code of Conduct for Data Centres (Energy Efficiency) to try and optimise existing facilities, reduce energy consumption and generally pave the way for a more energy efficient and sustainable data centre sector.

This was always envisaged as pre-cursor to more formal regulation, to prepare the industry for what was coming down the road, and that regulation landed in March with the publication of the Energy Efficiency Directive and a delegated act targetting data centres, the 2024 C 1639 which you can download from this link http://data.europa.eu/eli/ reg_del/2024/1364/oj. In essence, data centres will have to report a shed load of operational data including PUE, REF, ERF and WUE for the 2023 reporting year by the 15th September 2024, and data for the 2024 reporting year by the 15th May 2025. From recent events and conversations, it appears that the existing data centre sector will struggle to even collect the raw data they will need to use to calculate, let alone report this data to the EU

Radical Rethink

What of the cost of Al? This is the cost of the buildout in terms of data centres, grid infrastucture, hardware, software etc, I tried to find out, but the range was too vast for sensible contemplation, it will be in the trillions when everything is accounted for, if we continue to use a 20th century design and build strategy.

We have an opportuity to use just a portion of the obscene amount mooted for AI to really conduct some serious research and development for a "radical redesign" for the real data centre of the future, one that meets the true definition of "sustainability" to satisfy the needs of today without compromising the needs of future generations. Research for instance, into Graphene, a substance that could reduce energy consumption from chips, and emit less heat, thus reducing cooling requirements, surely this is a better use of resources and cash?

So, beware the Al'ds of March...

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Grid-interactive UPS – How data centres can actively enable Ireland's renewable energy transition

By John Byrne, Managing Director - Ireland at Enel X, and Evan Barker, Manager - Facilities Engineering at Digital Realty

ELECTRICITY GRIDS of the future will depend on the evolving relationship model between user, technology and local regulations. This evolution unlocks a massive opportunity for businesses of all types, but especially data centres, to use their energy storage assets in new ways that add commercial value, resilience, and improved sustainability – for their organisation and for the grid.

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Grid stability – a growing challenge

Ireland has emerged as a major hub for data centre activity, attracting both domestic and international companies. The sector is an important source of income for the country, with revenue projected to reach US\$1,198m in 2024.

At the same time, the sector is coming under criticism for its heavy use of electricity – consuming up to 18% of the country's electricity in 2022. Capacity constraints in the grid have caused so much concern that there has effectively been a moratorium on the connection of new data centres in the Dublin area until 2028.

This is coupled with Ireland's Climate Action Plan's ambitious target for 80% of the country's electricity to come from renewable sources by 2030. Ireland is well on the way to meeting this target with over 35% of its power currently generated from renewable sources.

Renewable energy sources are more sporadic than traditional carbon fuelled power sources. Integrating them makes the grid less stable. Variations in power production cause small shifts in the balance between supply and demand on the grid that can be seen as frequency fluctuations. Ireland's secure and sustainable electricity policy

EirGrid, the electricity Transmission System Operator (TSO) in Ireland, has designed its "Delivering a Secure, Sustainable Electricity System" (DS3) with the specific aim of creating the right conditions to safely and securely add more renewable energy to the Irish power system – without having to rely on traditional power stations for backup.

DS3 works by balancing the frequency of the grid as it fluctuates in response to variations in the quantity of renewable energy generation. If the frequency of the grid can be maintained at 50 Hz, more carbonfree electrons from renewable generation can be added to the power transmission lines feeding businesses and homes around the country. Frequency response programs, including DS3, require standby energy assets that can react to grid signals within seconds or even milliseconds. This is where data centres come in. Battery energy storage systems (BESS) are a highly versatile form of storage found in the Uninterruptable Power Systems (UPS) of most data centres. The main purpose of the UPS is to provide power conditioning and backup electricity for the servers.



UPS systems – a fast acting remedy

With response times below 0.5 seconds, UPS systems are fast enough to prevent data centres from losing power during an outage. Data centrescale UPS systems typically store enough energy for a few minutes of backup power. After providing backup power, UPS systems can recharge their batteries from the grid.

The availability required by the data centre determines the capacity of the battery and generator installation to ensure that the facility keeps the IT load going, no matter what. This results in often unused capacity that, with the right tools, can be made available to the grid to help it recover from an outage or even prevent one occurring.

A collaboration between Enel X and the global data centre, colocation, and interconnection solutions provider, Digital Realty, is pioneering this approach in Europe. Together, Enel X and Digital realty are making it possible to use a data centre's UPS to stabilise the grid, in what is known as grid-interactive UPS.

Enel X installed hardware at Digital Realty's data centres to both meter the UPS and send power requests to the UPS during times of grid disturbance. These devices have been designed and built to meet the requirements set out by the TSO. Grid compliance testing ensured that the system worked as expected following its installation. In order to provide frequency balancing support to the electricity grid, the data centre batteries had to meet essential criteria:

- O 20 millisecond event data
- GPS time synchronisation of +/- 2ms
- I second real-time data
- 5 second data latency
- Response time <2 seconds

How data centres can reduce grid stress and costs

Digital Realty is now using batteries on its installed UPS systems to give back to and support the grid









through dynamic frequency balancing services. Whenever minute fluctuations in grid frequency occur, its UPS batteries are enacted to remove load from the grid in sub-2-seconds. This supports the constraint on the grid and allows the frequency to reset to its normal operating frequency of 50 Hz, and avoids the need for taxpayers' money being used to have power plants on standby.

The project is setting a scalable precedent, paving the way for data centres and other large energy consumers to use their UPS to bolster the electricity grid they depend on, and effectively become an intrinsic part of Ireland's electricity system – actively facilitating the country's transition to renewable energy.

Core to meeting these requirements is a dynamic controller developed by Enel X, in collaboration with IoT technology company, EpiSensor. The solution tracks millisecond-by-millisecond grid frequency variations and, during moments of grid frequency instability, increases or decreases battery output to the required level; helping to restore balance to the grid. It is a process that varies battery levels by a small amount while the data centre continues to run on grid power, ensuring that there is no risk to business continuity. You can think of it like a dimmer switch that can be adjusted to meet the needs of the grid in near real time.

By creating a solution that was compliant with Eirgrid's strict programme rules, the data centre batteries can provide frequency balancing support to the electricity grid. This turns a largely idle asset into an active facilitator that helps to create the grid necessary to achieve renewable targets.

Introducing grid-interactive UPS means that data centres could shift from being huge consumers of energy into being a critical part of the wider electrical distribution system.

A triple win – for data centres, the grid and the environment

There are benefits to the data centres through this approach in addition to becoming good grid citizens. As well as supporting the grid through frequency balancing services, the grid-interactive UPS can help data centre operators become more energy aware and use their UPS to support with demand management programs with the local grid – also known as 'peak shaving. In this way, data centres can lower their energy consumption by switching to on-site power generation or using stored capacity in batteries. This helps to avoid grid outages and reduce overall energy cost, with a positive impact on a facility's Total Cost of Operation (TCO) – which is primarily led by the cost of energy.

A study by Baringa considers that if all data centres utilised their UPS as grid-interactive UPS, the need for peaking power plants that rely on fossil fuels, would be negated; saving 1.5 million tonnes of CO2 annually for the Irish power sector. For context, this is equivalent to 2.47% of total CO2 emissions in Ireland in 2022, or the annual carbon emissions of more than 700,000 private cars on Irish roads. Without the need to burn fossil fuels to provide these frequency balancing services, the cost passed on to end consumers for electricity could also be reduced with estimated savings of 270 million euro per year.

This innovative use of battery assets by Enel X and Digital Realty demonstrates how data centres can play a key role in supporting electricity grid stability during periods of exceptionally high demand or supply shortages.

Rising to a global challenge

The joint frequency response program in Ireland leverages the success achieved by a longstanding Enel X - Digital Reality collaboration in Asia Pacific; starting back in 2018 with two data centres in Sydney.

As other countries transition to a greater reliance on renewable energy, they are encountering a similar situation to the one in Ireland. In the UK and Europe recent grid modifications and code changes have been introduced to accommodate more variable renewable energy.

Such reforms are enabling the innovative use of data centre battery assets to support electricity grid stability – as homes and businesses around the world make the transition to net zero.