



COMPUTACENTER INSIGHT: CLOUD, DATA CENTER, AND ALL THINGS DATA

A collection of expert opinion, analysis and 2022 predictions
from across Computacenter's Platform & Hybrid IT Practice



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“As a Computacenter business line focused on IT transformation, the market did not stop, demand went up, and we continued to recruit, invest and support our customers.”

FOREWORD & INTRODUCTION

ABOUT PAUL

Paul has 35 years' experience of working in the IT industry and joined Computacenter in 1999 as Virtualisation Technology Leader. Moving up through the ranks, Paul took on the role of Practice Leader for Data Center, Server, Platforms, Virtualisation and Automation before taking up his current position of CTO – Platform & Hybrid IT in 2013.

Prior to Computacenter, Paul worked in the Financial Services sector on both UNIX and Mainframe platforms in operational and systems programming roles.

As we begin 2022 and hopefully exit out of the stop-start nature of the past 24 months, I am watching with interest how we adapt to the hybrid work environment. I am one of the lucky ones who only saw upsides of the past two years, through working from home in the form of additional family time and significantly reduced travel and hotel stays.

There is something about being face to face in a room that cannot be matched by collaborating virtually when being creative or building a strategy, so I welcome the opportunity to bring the team together in person on a regular basis again. However, it would be wrong to say the lack of face-to-face time has held us back. As a Computacenter business line focused on IT transformation, the market did not stop, demand went up, and we continued to recruit, invest and support our customers.

As part of the Office of the CTO, my direct reports play a key role in defining the market opportunity, directing the build of our solutions and then working with our customers to understand their needs as they have navigated their way around the pandemic. The following opinion pieces are a short reflection on what my team has seen and the outlook for the solution areas they look after.

If you would like to know more and to speak in person...we are open for business if you are...



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“Any first wave of cost optimisation should look to target ‘quick wins’ that make immediate savings and demonstrate the value of cloud cost optimisation to the business.”

CLOUD ECONOMICS

ABOUT PAUL

Paul joined Computacenter in 2019 bringing with him over 25 years of client-facing technical consultancy experience across a broad range of vertical industries. Working as a Solution Leader, Paul is responsible for developing Computacenter’s UK&I Google Cloud Platform (GCP) service propositions as well as supporting Computacenter’s customers through their cloud journeys.

Flexera’s 2021 State of the Cloud Report highlighted once again that one of the major challenges enterprises face in their consumption of cloud services is controlling spend. Around 80% of those questioned cited spend as a major issue both this year and last, with respondents estimating they waste 30% of their cloud expenditure spend as cloud consumption accelerates year on year. Given these figures, it’s perhaps unsurprising that 61% of organisations plan to optimise their existing use of cloud [cost savings], making it the top initiative for the fifth year in a row.

At Computacenter, we recognise these challenges and from our experience of supporting our enterprise customers in their cloud journeys we are aware that the implementation of cloud services is often decentralised and driven by separate business lines. This has left central IT departments, faced with growing demand from business lines, to rapidly adopt cloud services while often having little time to face the spend challenge holistically. Each Hyperscaler now has multiple cost, billing, and reporting services, and there are multiple multi-cloud cost management tools in the wider ecosystem.

These cloud-native or best-of-breed tools can provide both a granular breakdown in spend [chargeback] and provide a slew of near real-time insights, reports, and recommendations. Whilst there is little doubting the value of these tools, they require a significant level of interpretation from skilled cloud practitioners in order for customers to action the large range of information provided and move toward a level of remediation that provides lasting value.

To provide a more structured approach to facing these challenges Computacenter works in a phased approach around Cloud Economics that is cyclical in nature.

Any first wave of cost optimisation should look to target 'quick wins' that make immediate savings and demonstrate the value of cloud cost optimisation to the business. Using existing cloud native cost tooling or one of our partners market-leading tools (for example, VMware CloudHealth) we have identified a set of six areas in which discovery and review exercises will identify, document, and prioritise the highest 'value' items within each area and define remediation activities to resolve:

1. Elasticity
2. Usage Discounts
3. Rightsizing and Usage
4. Tooling
5. Low-Cost Instances
6. Software Licensing

The key here is being able to use the right skilled resources to understand the data the tools are generating and create the tasks and effort required to undertake these activities with minimal disruption to ongoing cloud operations. Clicking a button to right-size a cloud-based compute instance may seem simple enough but there may be rationale for its use or associated dependencies which is where experience plays a vital role.

Once an organisation has established any initial savings and addressed the immediate need to gain a level of spend control, further remediation activities can be planned. The organisation can then implement a second phase of cloud economics that targets the definition of longer-term strategic approaches such as the development of a business led FinOps capability.

We have seen cloud FinOps really take off in 2021 with organisations such as the FinOps Foundation seeing a large ramp up in members and the advent of more dedicated cloud based FinOps professionals being employed across enterprises.

Adopting a cloud based FinOps model moves the organisation to placing spend management as a more centric element of ongoing cloud operations that become a wider organisational level responsibility. Again, we have identified six areas and a discovery / remediation approach that will help an organisation move towards the centralised FinOps function. The six areas are:

1. Governance
2. Commercial
3. Cloud Native Services
4. Automation
5. Reporting
6. Continual Service Improvement

This function then takes ownership of the management of cloud spend policies, the optimisation of commercial models, granular reporting / dashboarding and ensures the linkage between IT driven cloud teams and procurement functions.

We have seen these phases become cyclical in nature because the approach taken in identifying the quick wins becomes a regular service improvement activity within the FinOps function.

PAUL'S CLOSING VIEWS

As we move forward, we will see the spend challenge become more urgent, tooling get more complex, and the need to simplify and support operational cloud teams more critical. These teams will continue to be under pressure in terms of delivering cloud services to the business in short timeframes and being asked to do more with less. Adopting structured thinking and methodology around cloud economics services will see organisations have more success addressing their cloud spend initiatives.



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“There’s a temptation to jump straight to the locality argument, as people did with ‘Cloud vs Data Center [Core]’, however this time it might be the determining factor (be that a limitation or benefit).”

CLOUD TO CORE TO EDGE

ABOUT GRAEME

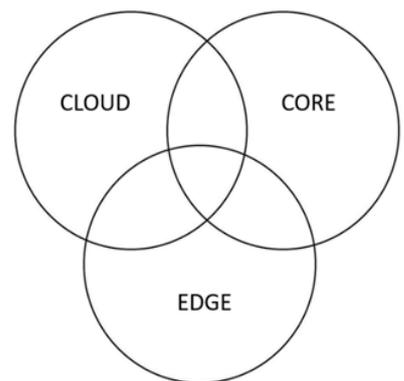
Graeme joined Computacenter in 2020 and is responsible for the ongoing development of the company’s Next Generation Data Center solution offerings. Having worked in the IT industry for 25 years, Graeme joined Computacenter after 13 years at Dell EMC where he had various roles focused mostly on the Global Accounts and strategic engagements. Prior to Dell EMC, Graeme spent time at other organisations such as Cisco and Morse.

In the same way that we have matured to recognise that most organisations will run workloads in public clouds as well as their own data centers [84% of organisations according to IDC], there is a recognition there will be a third flavour of infrastructure and workload: Edge. IDC has projected that the Edge market will be around \$250 billion by 2024, and Gartner predicts that by 2025 over 75% of data will be created outside of a core data center or cloud.

After years of the ‘Cloud vs Data Center [Core]’ debate, we now accept both will be used for customers’ core workloads. There are generally accepted reasons for the ‘not in the public cloud’ camp – for example, data sensitivity, regulation, data gravity, and economics. We accepted these to be valid reasons to retain workloads or data on-prem and matured to not focus solely on the locality for the workload [on-prem or off-prem].

With on-premises clouds and hybrid or multi-cloud operating models spanning on or off-premises, it means that the right workloads run in the right place, for the right reasons. Every customer has a different balance between workloads being in [public] Cloud and Core, and every customer will be different in their need for Edge capabilities – although industry vertical will be a big influence.

Rather than think of ‘Cloud to Core to Edge’ as a continuum, or three disparate islands of infrastructure, a more helpful way to illustrate the connection is via a Venn diagram with three overlapping circles relating to each locality / architecture. As previously covered, we are comfortable some use-cases will transcend Cloud and Core / on-prem. Similarly, in this Venn model some use-cases will span Cloud and Edge, and others between Core and Edge - and some will transcend all three. As customers plan where data will be created and captured; where or if that data will be stored; and where the applications will process that data, this might help plan software, platform, and data architectures thus ensuring a Cloud+Core+Edge composite IT with common operations, automation and security.



WHY IN THE EDGE?

Continuing the 'why not?' approach, to help define what Edge is and what you put there, it may make sense for customers to look at what functions they need or what actions they want to perform (or what data they need to collect and process), at their Edge. And to ask Why not in the Cloud? Why not in the data center?

There's a temptation to jump straight to the Locality argument, as people did with Cloud vs Datacentre/Core, however this time it might be the determining factor (be that a limitation or benefit). What might make edge locality the limiter, and the connectivity to the edge location, is data. It might be helpful to revisit the 'Three Vs of Big Data: Volume, Value, Velocity'.

- The Volume of data being produced in some Edge / IoT scenarios is huge, and it is simply not feasible to move it all into the Cloud or Core, especially real-time
- The Value of the data might not be in the data itself, but in the insights made from the data, potentially real-time, or in sifting down the data to only the relevant data and information. It might not make sense to move all the data into the Cloud or Core, even if you could. Technologies such as AI (Artificial Intelligence) and ML (Machine Learning) can operate on the data in-situ
- The Velocity of the data, in terms of its generation and ability to direct it to the Cloud / Core for processing, especially if it is transient data, is also a factor

Therefore, any approach to Edge must start with the data, the workloads that will use it, and build from there. Is a reasonable view of, and approach, to Edge, to be "Big Data on the Edge"?

WHY IN THE EDGE?

Given the Edge might be anything from a car, to a smart factory, to an oil rig, to a retail outlet, then no two customer scenarios will be the same. And based on the industry vertical and associated data generating devices, the type of data, quantity and use-cases for the data will vary. However, there are some common concepts:

- The Edge environment will have data-producing devices (for example, IoT sensors) and data storage devices
- Data will not only be captured, but also processed, and possibly acted upon in real-time

- You cannot move all the data, all the time, to the Core or Cloud. It may need to be sieved or parsed where it is, and only then (if at all) data moved to the Core or Cloud
- Connectivity to the Cloud / Core will be critical to dictate what is possible
- Data security is important at the Edge, and back to the Cloud / Core

BUILDING THE EDGE

Edge technologies and services are enabling digital transformation outside of the data center. We can locate light infrastructure and applications close to where data is generated.

The type of use-cases and workloads will determine the architecture, for example such as analytics, preventative maintenance (PM), AI, ML, smart factory, retail, self-driving, etc. In turn, the industry vertical will also have an influence on the use-case and data type. The leading industries for Edge adoption are Agriculture, Oil & Gas, Manufacturing, Retail, Healthcare, and Utilities & Energy.

Once a use-case is determined, a proof of value can be approached to build an Edge environment to prove a use-case. An Edge environment will be comprised of many infrastructure elements such as IoT devices, smart sensors, augmented reality (AR), virtual reality (VR), modular Edge IaaS (software-defined infrastructure), Edge PaaS for lightweight apps, Edge gateways and hyper-converged infrastructure for Edge computing, Edge networking with Wi-Fi/5G, and many more.

GRAEME'S CLOSING VIEWS

In summary, when reacting to the needs of the business, or being proactive into the business with technology innovation, before investing in technologies and services, ask yourself these questions: What is your Edge? What can't you run in the cloud or your data centers? What innovation could you create at your Edge locations?



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“Building a fully functional CCoE is the ideal scenario and whilst 2021 has driven more interest and conversations around how to correctly define and implement these within our customer base, the reality is that it takes time to address the cultural shifts in control and responsibility, plus the executive commitment to make this happen.”

CLOUD OPERATING MODEL

ABOUT STUART

Working within the Office of the CTO, Stuart is responsible for developing Computacenter’s UK&I Microsoft Azure service propositions.

Stuart has worked in the IT industry for 28 years in a variety of roles, from engineering to architecture design, across multiple sectors, focusing on customer challenges in the infrastructure and cloud space. Aligned exclusively to Enterprise sized customers Stuart’s focus is cloud adoption and how Computacenter can help organisations deliver their cloud strategies.

Procrastination is the thief of time and many organisations have been guilty of considering a larger move to cloud in recent years but haven’t fully committed for a variety of reasons.

It’s amazing how the pandemic has changed that approach and become the catalyst businesses needed to fully embrace public cloud and really accelerate their investments.

For some, it’s a case of consolidating premises and terminating leases where server rooms were once housed. For others, it’s the need to rapidly expand due to an increase in online demand or having switched to a hybrid working model where employees are provided access to virtual desktops.

It’s not all about public cloud though and on-premises hybrid solutions are likely to grow in the next few years but the short-term knock-on effect of Covid has meant more workloads are going north due to delays in getting hardware up and running inside a data center.

We’ve seen chip shortages, supply chain issues and even hauliers unable to make deliveries due to panic fuel buying, driver shortages or people gluing themselves to roads which has opened the door for more workloads in public cloud and whilst some could return over time, for now it’s a great stopgap until we’re over this bump.

These issues highlighted why the Capacity on Demand [COD] model offered by cloud providers is so attractive and Computacenter has seen a real up-tick in demand this year for our Landing Zone services which are used to provision the initial foundational layers of security, governance, connectivity, and management in the cloud.

This sudden accelerated adoption doesn’t come without challenges though with the biggest being a shortage of skilled people and the need to adopt new cloud operating models.

Computacenter is well positioned to help organisations with both challenges and regardless of the chosen cloud vendor, typically either Azure, AWS or GCP, we have the experienced delivery teams to provide support.

Where operating models are concerned, there isn't a one size fits all approach, but their purpose is always the same which is to define the processes and procedures needed to operate technology in the cloud.

This starts by understanding the strategic direction, governance, risk, and compliance needs of the business which helps define the most appropriate approach to adopt.

Given that Computacenter's customers are typically in the Enterprise space, the type of operations approach we normally see is one that looks to balance the need for control and innovation by democratising decisions and responsibilities. This results in the traditional central IT team being replaced by a cloud center of excellence / enablement (CCoE), who define the policies and put in place the guardrails to allow other areas of the business to accelerate their cloud adoption in a controlled way.

Building a fully functional CCoE is the ideal scenario and whilst 2021 has driven more interest and conversations around how to correctly define and implement these within our customer base, the reality is that it takes time to address the cultural shifts in control and responsibility, plus the executive commitment to make this happen.

So, this year has been mostly focussed on building out those Landing Zones, helping to identify skills gaps and supporting the definition of automated policies which put in place the guardrails to protect those individuals who are standing up workloads in the cloud.

STUART'S CLOSING VIEWS

What we are likely to see over the next few years as these teams overcome the learning curves and begin to mature their processes will be the benefits of operating in this way and the forming of CCoE's becoming the norm for Enterprise businesses.

In the short-term, organisations who have rushed to get workloads into the cloud will need to spend time looking at optimisation techniques from both a cost management and performance stance.

Computacenter understands what's required to build, run, and optimise a modern cloud platform and we have developed services to support organisations as they embark on this journey, wherever the destination.



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“A good example is the role of Site Reliability Engineering [SRE]. I dare say this is a role you will increasingly hear of, but importantly DevOps principles are applied in the day-to-day working practices of a Site Reliability Engineer. Any customer that understands DevOps will not have DevOps Engineers as they don't engineer DevOps. Instead, they engineer site reliability, platforms, software, infrastructure and so on.”

DEVOPS & OBSERVABILITY

ABOUT DEAN

Dean is a Solution Leader at Computacenter with responsibility for developer velocity in the UK business. Having joined the company in 2015 as a Solutions Architect, Dean has fulfilled various customer facing consulting roles that help deliver technical and operational change for Cloud services adoption. Previously, Dean worked for Betfair as the Lead Architect building and operating a new private cloud and application deployment catalogue engineered for DevOps.

‘DevOps!’ Maybe five years ago, relatively few people would have known much about it. Now, you will be hard pressed to find anyone working in IT that does not know of it!

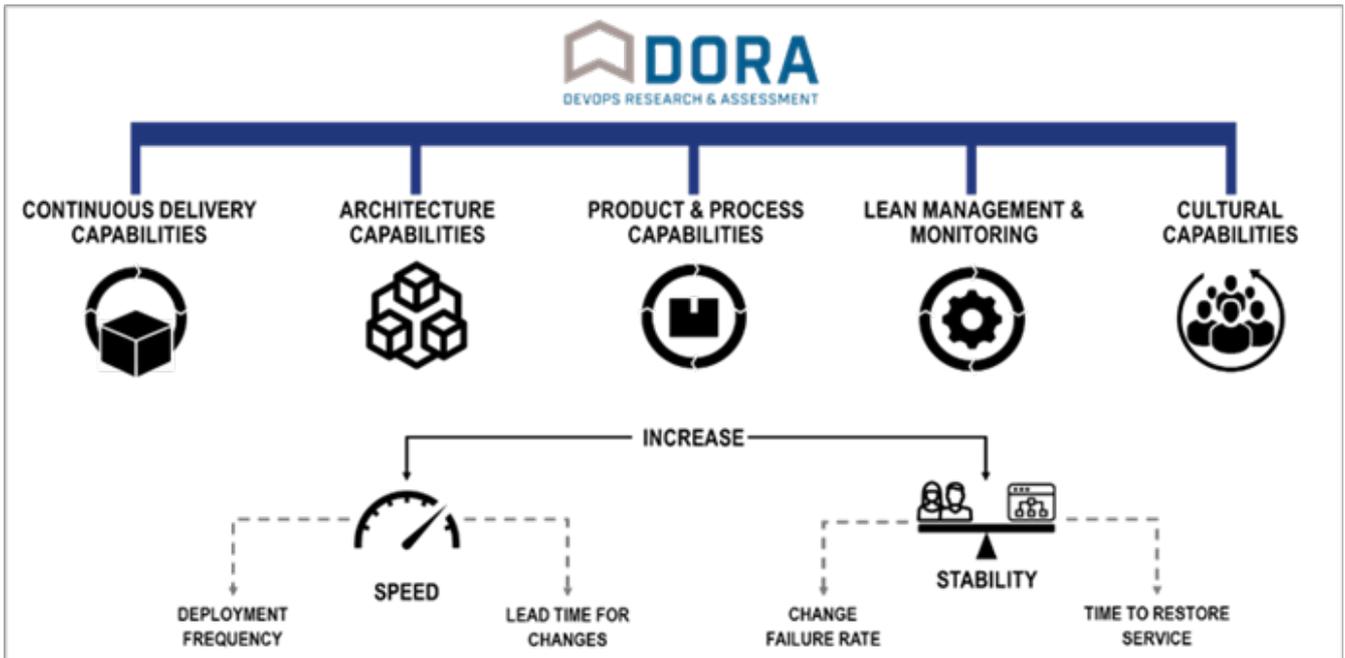
Interestingly though, the majority today still struggle to correctly understand it to be a set of practices supporting an agile approach to software development, and not a set of tools, a role, or a dedicated team as some often seem to suggest. Or, to put it differently, you would apply DevOps to the way developers create and deploy code, and the way engineers build and support platforms & infrastructures.

A good example of the latter is the role of Site Reliability Engineering [SRE]. I dare say this is a role you will increasingly hear of, but importantly DevOps principles are applied in the day-to-day working practices of a Site Reliability Engineer. Any customer that understands DevOps will not have DevOps Engineers as they don't engineer DevOps. Instead, they engineer site reliability, platforms, software, infrastructure and so on. Hopefully you get my point.

My reason for opening with this point is simple. Historically Computacenter's customer base had small pockets of understanding around DevOps with relatively small but notable areas of impact across the organisation. Over the past couple of years however, we are seeing a critical mass of DevOps awareness building, penetrating further across the enterprise, and being acutely connected to the pursuit of high performing teams.

Research, such as 'DORA's State of DevOps', have become established reads for business and IT decisions makers. These reports are providing useful insights into the fact that how an organisation chooses to deliver and operate software, can have a direct and measurable impact on business performance. Over the

course of 2021, we have been tapping into this growing awareness of DevOps in our customers and working with our partners Google & DJOPS to extend the knowledge and tools we can have at our disposal to help customer's measure and assess their DevOps capabilities. And act on them of course!



Undertaking this work is important for our customers so they may better understand what good capability looks like, be measured against them, and receive expert guidance on where to prioritise their investment accordingly.

As we move through 2022, I expect this to be an important service for us in support of our new Developer Velocity proposition. We expect three key areas to be a priority for customers as they scale their development activities in support of building new and modernising existing applications:

1. **Cloud Native Application Platforms** – leveraging Kubernetes and container solutions to provide a highly automated experience for developers in building, deploying and releasing their software
2. **DevSecOps** – unifying and standardising the Continuous Integration / Continuous Delivery (CI / CD) tool chain, allowing developers to scale software delivery and make security intrinsic and seamless
3. **Observability** – enabling development, operations and business teams to gain real-time insights into their customers' digital experience and enhance monitoring to include distributed tracing and Artificial Intelligence (AI) driven operations

Naturally, underpinning these will be a continued demand for Professional Services (PS) engineering services. If you search 'Top 5 in-demand roles', most of the results you see will have 'lorry drivers' as number one, but most will have 'software developers' in that list too. Important for us in 2022 will be the ability to provide software engineering skills and services out of our Romania delivery center, especially as our customers seek lower cost to service options that enable them to scale their development.

I expect there to be a growing demand for each of our Developer Velocity proposition areas, but I believe Observability will be key. I say this not only because it is vital in ensuring businesses have the critical insights into their users' digital experience, but also because of its relevance to a wider set of important use cases. One example I believe is often overlooked is cloud migrations.

If we ignore re-factoring to microservices for a moment and look at just lift-and-shift or re-platforming migrations, we still see a need to correctly observe the system over the course of an IT migration. In these scenarios, we are not concerned about changes to an application's functional architecture, as there will not have been any, but we are concerned about changes to its technical architecture and how these can potentially affect the way the application runs, or the path a user session takes in transit.

Instrumenting these changes is important to cloud migration programmes for aspects such as pre- and post-migration baselining of performance and user experience. Also, for conducting migration retrospectives to understand the needs and methods necessary to optimise the application operation. So hopefully you can see there are several observability conversations to be had next year.

DEAN'S CLOSING VIEWS

I believe the efforts our customers will make over the coming years to build high performing teams and improving how they build and run software, presents us with exciting opportunities to engage on new topics within our existing buying centres, but also take us closer to new buyer centres within our customers business teams.



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“On the other hand, we also have customers who are thriving with more offensive data strategies. The ability to gain additional value from their business held data is critical to their market presence, leveraging the growing capability of cloud to ease the inconsistent nature of their data requirements through flex up and flex down capabilities.”

DATA DRIVEN

ABOUT DARREN

Darren has held various technical, pre-sales and sales roles since joining Computacenter in 1998 and has experience of working across all industries including pharmaceutical, finance, retail and enterprise. Currently a Solution Leader within the office of the CTO, Darren is responsible for the development of new data and information portfolio offerings, as well as expanding our capability to meet the increased customer demand we are seeing across the hybrid landscape of cloud and data center.

Over the last 12 months we have seen an acceleration of data driven IT capabilities across Computacenter’s customer base and in response we have increased our enablement and ability to deliver services and solutions in this area.

In early 2022, we will be launching our own dedicated UK-centred Data Practice to support our customers even further in this ever-expanding market. The practice will bring additional data-focused services to our already mature Next Generation Data Center (NGDC) and cloud portfolio of products. Assessment, design, and delivery services driving data platform modernisation, business-focused data engineering and business intelligence alignment underpinned by management and data security capabilities will ensure compliance and protection wherever our customers’ data may sit.

Our enterprise customer base varies in how they see and operate their business around their data assets. Some organisations naturally take a more defensive approach to how they curate and consume data. This defensive strategy can range from the modernisation of legacy environments into a more cloud-aligned IaaS or PaaS data platform estate, or the migration of existing data assets and services to meet previously agreed cloud consumption quotas. Either way with this comes the inevitable expansion and maturing of their data protection and availability policies and procedures to meet data governance requirements.

On the other hand, we also have customers who are thriving with more offensive data strategies. The ability to gain additional value from their business held data is critical to their market presence, leveraging the growing capability of cloud to ease the inconsistent nature of their data requirements through flex up and flex down capabilities. That said, within our customer base, very few have just sprung up in recent years, gifted with a perfectly drawn data architecture, ideal for their business needs of today.

The majority of our customers have been in business for many years and have an underlying architecture and infrastructure that has grown with them. This naturally provides challenges in how to acquire data and ensure that it is appropriate, accurate, and viable for their needs. In other words, good old data governance, it's not gone away, and with the landscape of today and the likely requirements of tomorrow, it's even more important.

So how are our customers tackling this challenge? How do they maintain a successful data governance regime when their data is continuing to grow, the technologies and access methods are becoming more and more varied, and users are demanding real-time accuracy to make business critical decisions? The answer is as disparate as the data itself. Some are tackling it with a holistic strategy to address the big picture. Others are more content to define minimal viable product (MVP) which tackles the big hitters or low hanging fruit first, then once in place gradually bringing in more and more services. In my mind, this is a much more palatable way to "eat the elephant" and stops any inertia due to not knowing where to start.

DARREN'S CLOSING VIEWS

Regardless of which side of the coin our customers land, offensive or defensive, the threat and risk of ransomware and how to recover from an attack, should the worst happen, has been in the forefront of their minds. The focus has shifted from sitting squarely in the network and security domain and now spans all business units, with plans needed at a granular level.

Yes, the network and security teams are still the bouncers on the door, using process and technology to ensure the bad guys remain outside, but, what if they are already inside? What damage can they do? Do you understand what data and assets you need to bring your business back to life quickly and effectively?

These are the very reasons why Computacenter has developed critical data services, helping our customers identify what is vital to their survival, and once defined, how they protect and maintain ongoing plans for secure data growth and protection.

Personally, I'm really excited by the opportunities and growth that data brings to both Computacenter and our customers and very much looking forward to seeing what 2022 brings.