

## A vision for IT infrastructure in 2030: challenges, opportunities and trends





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## Introduction

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2030 doesn't seem so far away but a lot can happen in a decade, especially in the fast-moving IT infrastructure environment.

> The 2010s proved to be an era characterised by disruptive change

Certainly, the landscape has changed out of all recognition over the past three decades. If you turn back the clock to 1990, the internet was yet to be operational and microcomputers were filling old mainframe computer rooms, which were to become known as data centres. Even looking back ten years merely serves to highlight the point. The 2010s proved to be an era characterised by disruptive change. New networking technology brought higher capacity and higher throughput as 3G networks morphed into 4G ones. Over the past few years, we have seen the emergence of the latest generation of networking technology, 5G, which is effectively helping to support the ongoing roll-out of the Internet of Things (IoT).

In parallel to that, we have witnessed a shift in computing power and resources to the edge of network infrastructures and we expect that to continue. MarketsandMarkets projects the global edge computing market to grow from US\$ 3.6 billion in 2020 to US\$ 15.7 billion by 2025, at a Compound Annual Growth Rate (CAGR) of 34.1% during the forecast period. The decade also saw a huge acceleration in the migration of organisations to the cloud and to hybrid networking environments. That's continuing into the current time. Gartner recently forecast public cloud revenue would grow 6.3% in 2020 to total \$257.9 billion, up from \$242.7 billion in 2019. Big data became a hot topic across almost every industry as firms looked make use of the intelligence across their systems and infrastructure to fuel analytics and drive business decisions.

Fast-forward to today and current challenges include the need to ensure security and compliance of network and systems, the ongoing migration to cloud and all that entails and the continuing struggle to reduce the environmental impact of IT infrastructure. "I&O leaders need to get in front of this trend, accelerating the enterprise's efficient adoption of a growing range of edge computing use cases for the enterprise to be competitive"

IT decision-makers, including network and infrastructure managers within many firms have a raft of issues to deal with, including keeping pace with the rapid evolution of technology, ensuring capacity is always available, maintaining optimal operating conditions while reducing carbon footprints, upholding the strictest security measures and ensuring uptime with zero interruptions to service.

Data centres, and the attendant world of network management, are also on the verge of a new shakeup as 5G drives hyper-connectivity, moving data processing to the edge and expanding enterprise networks. Gartner argues that information and operations (I&O) should lead edge computing, stating: "I&O leaders need to get in front of this trend, accelerating the enterprise's efficient adoption of a growing range of edge computing use cases for the enterprise to be competitive."

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It has been a disruptive decade in the world of IT infrastructure then and 2020 ramped up disruption further as the Covid-19 pandemic played out, slowing down spending on IT infrastructure in the short-term but also potentially fuelling the ongoing trend towards digitalisation and the shift to hyperconverged infrastructure and the public cloud.

So what's likely to happen in the IT infrastructure environment come 2030? How do we expect these trends to play out over the longer-term? As we mark 30 years since we opened our first London data centre Telehouse North and became Europe's first colocation provider, we commissioned independent research to find out what the next ten years may have in store.

Surveying 250 UK IT decision-makers, we sought to gauge their views and opinions on the infrastructure challenges and opportunities they are likely to face, as well as their priorities over the coming decade. From security to cloud adoption, sustainability and the growth of edge computing and data volumes, the research identifies the key trends and technologies that are likely to shape infrastructure in 2030.



So what's likely to happen in the IT infrastructure environment come 2030? How do we expect these trends to play out over the longer-term?

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## Key findings

#### Security and compliance remain the biggest challenges, but environmental impact is a growing concern

- 97% of respondents expect to face infrastructure challenges over the next year
- 'Maintaining security and compliance' was the top infrastructure challenge cited by 33% of respondents
- Reducing the environmental impact of IT infrastructure is a top challenge for over a quarter of respondents (26%) but rises in importance to become the second biggest challenge expected in 2030, cited by 30%

## Edge computing is important, but cost of investment remains a barrier

- Nearly nine in ten (89%) respondents say that edge computing will be important to their business in the next ten years
- Over a quarter (26%) are already deploying edge computing and over a third (37%) plan to do so by 2030
- But barriers still exist that are slowing down adoption including 'cost of investment in edge connectivity' (44%) and 'lack of knowhow connecting to edge networks' (36%)

#### There is a strong desire to shift from on-premise to colocation

- Updating aging infrastructure remains a significant challenge for organisations, listed by 29% of IT decision-makers as a key challenge
- The majority of infrastructure is still kept in-house 64% of IT decision-makers say their organisation still keeps more than 25% of IT infrastructure on-premise, rising to 75% among companies with more than 1,500 employees
- But there is a strong desire to move away from on-premise. Looking ahead to 2030, nearly one-third (32%) are planning to shift from on-premise to colocation

## Outsourced data centres and associated services are growing in importance

- Nearly three-quarters (72%) of respondents said that data centres had risen in importance over the last 12 months
- Of those, the primary reason cited was 'need faster access to data and services', highlighted by nearly half (49%)
- Nearly two-thirds (62%) expect their organisation's investment in data centre infrastructure to increase over the next ten years





97% of respondents expect to face infrastructure challenges over the next year



26% are already deploying edge computing and 37% plan to do so by 2030



Updating aging infrastructure remains a significant challenge for organisations



62% expect their organisation's investment in data centre infrastructure to increase over the next ten years



82% of respondents say it is important for their organisation to use data centres powered by renewable energy



14% say the biggest barrier to adoption or disruptive technologies are lack of skills



85% of organisations say Covid-19 has impacted their digital transformation efforts



80% expect the volume of data they manage to increase in the next 10 years

#### But as data centres rise in importance, so does sustainability

- 86% of IT decision-makers say sustainability is important to their IT infrastructure decision-making process
- 82% of respondents say it is important for their organisation to use data centres powered by renewable energy
- Yet only a quarter (26%) cited renewable energy as a key consideration when choosing a data centre provider, lagging behind other factors
- Almost a third (32%) say they don't currently monitor the environmental footprint of their IT operations

#### Skill gaps do exist and need to be addressed

- Despite high confidence in their teams skills, only 7% are bold enough to claim 'there are no IT skills gaps in my organisation'
- When it comes to assessing the biggest IT skills gaps their organisations are facing, 33% highlight AI, 23% security and 16% data analytics
- Lack of understanding of how to interrogate and consolidate data' was cited by 17% as the biggest barrier to adoption or disruptive technologies followed by lack of skills (14%)

#### The pandemic has caused IT-decision-makers to rethink

- 85% of organisations say Covid-19 has impacted their digital transformation efforts
- 91% experienced infrastructure challenges as a result of the change in working practices driven by the pandemic and are planning to make changes to their IT infrastructure
- 41% plan to increase bandwidth/connectivity options, over a third (38%) plan to shift more workloads to the cloud and 34% will increase capacity in the data centre

#### Cloud, cyber security, 5G, Al and Big Data are the biggest focus areas for organisations

- 80% expect the volume of data they manage to increase in the next 10 years and nearly a third (30%) plan to bring applications closer to data sources
- The top five focus areas over the next ten years are cloud (44%); cyber-security (40%); 5G (29%); artificial intelligence and machine learning (27%) and Big Data (27%)
- Insufficient budget is the biggest barrier to the adoption of disruptive technologies like Al and edge computing, cited by one-fifth of respondents

## Scoping the infrastructure challenges

With organisations increasingly undertaking digital transformation projects and moving to the cloud, most IT estates are characterised by a complex mix of legacy and innovative new technologies. Given this, it is no surprise to see that almost all IT decision-makers (97%) anticipated that they would have to face some kind of infrastructure challenges over the next 12 months.

The survey sample as a whole highlighted security and compliance as the biggest infrastructure challenge they were likely to have to combat over that timeframe, while at the same time flagging environmental impact as a growing concern.

'Maintaining security and compliance' was referenced by 33% of respondents among their top three challenges. As networks grow and become more sophisticated, these issues are likely to become increasingly front of mind for IT professionals and the pandemic has undoubtedly raised their priority level still higher. One in four (26%) agreed that reducing the environmental impact of IT infrastructure is one of the top three challenges facing their organisation today.

This figure rises to 30% when looking ten years into the future and becomes the second most-commonly cited challenge (currently fifth). That's testament to how the need to be more sustainable and reduce the organisation's environmental footprint are likely to grow in importance over time.

Infrastructure as a whole is seen as a significant risk to businesses moving forwards. 93% of IT decisionmakers said it posed a risk of some sort to their organisation over the next ten years. Software was the infrastructure area seen as posing the biggest risk to organisations over that timeframe. Nearly half (46%) of the sample highlighted it among their top three risk factors, followed by physical data centre security and people (both 38%). Hardware trailed behind in fifth place as a risk factor, with just 30% citing it. That's testament to the relative declining importance of hardware relative to software in the network infrastructure. Interestingly though, for ClOs, the top two projected risk areas are networks and physical data centre security (both 43%). One in four (26%) agreed that reducing the environmental impact of IT infrastructure is one of the top three challenges facing their organisation today

### Infrastructure areas seen as the biggest risk to organisations over the next 10 years







#### IT decision-makers' fears causing network downtime over the next 10 years



Nearly nine in ten of the survey sample say that edge computing will be important to their business in the next ten years

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IT decision-makers fear cyber-attacks more than any other driver of network downtime over the next ten years. More than a quarter (28%) saw this as the most likely cause of network downtime in their organisation over the next decade. This was followed by network failure (17%) and human error (14%). Only 5% felt that they would not experience downtime in the next 10 years.

Nearly nine in ten (89%) of the survey sample say that edge computing will be important to their business in the next ten years. That percentage is as high as 97% among the largest organisations (those with over 1,500 employees). But organisations still see many barriers slowing them down from connecting to edge network. The top two highlighted are 'cost of investment in edge connectivity' (44%) and 'lack of knowhow connecting to edge networks' (36%). Security was less of a concern here, with just 24% saying they were unsure how secure edge networks were.



Key priority areas for organisations when it comes to technology focus and investment



Fast-forward ten years, however, and the percentage expecting to be deploying cloud has gone down slightly to 60%, while onpremise has also fallen to 24%. High-performance computing has risen significantly to 39%, and edge has grown dramatically also to 37%

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## Strategy and priorities

Spending on IT remains robust today as businesses continue with their digital transformation efforts. Networks remain dynamic and ever changing and despite the pandemic, activity remains dynamic in the world of IT. The survey looked at key priority areas for organisations when it comes to technology focus and investment. Cloud remains the primary business model used by organisations today. 68% of the sample said their organisation was deploying cloud, compared to 32% on-premise. This was followed by high-performance computing (also 32%); hyperscale (30%); edge (26%); colocation (18%). Fast-forward ten years, however, and the percentage expecting to be deploying cloud has gone down slightly to 60%, while on-premise has also fallen to 24%. High-performance computing has risen significantly to 39%, and edge has grown dramatically also to 37%.

That represents a significant increase in the prevalence of edge but an increase that is in line with industry expectations which project that the rising 5G and IoT wave will result in a significant growth in edge computing. The future is certainly looking bright for the edge data centre industry. Indeed according to recent figures from PwC, the market is on course to almost triple in size to \$13.5 billion in 2024 from \$4 billion in 2017.

The survey meanwhile also recorded projected rises in usage, albeit small ones, for colocation, (up 2% to 20%) and hyperscale (up to 2% to 32%), over the tenyear period.

Among those IT decision-makers whose businesses are using colocation today, the biggest business driver behind the decision to use is to 'improve connectivity' (47%). The next highest was to 'increase remote access and remote working', highlighted by 38%, an indicator perhaps that the pandemic is likely to grow colocation take-up. A third of the sample (33%) highlighted 'strengthen security and compliance'.

Despite a widespread desire to move to cloud, though, the majority of infrastructure is still kept in-house. 64% of IT decision-makers say their organisation still keeps more than 25% of its IT infrastructure on-premise. Among companies with more than 1,500 employees, that figure rises to 75%. 68% of the overall sample keep up to 50% of their IT infrastructure on-premise and 31% keep over 50% of their IT infrastructure on-premise. The average amount of infrastructure on-premise is 54%. Looking ahead to 2030 though, there is a definite shift. That average figure falls to 32%. 47% as compared to 64% of IT decision-makers say their organisation still keeps more than 25% of its IT infrastructure on-premise. And the proportion of respondents from organisations with more than 1.500 employees that say this has grown to 50%.

Outsourced data centres and their associated services are growing in importance, driven by the need for faster access to data and services. Nearly two-thirds (62%) of the sample expect their organisation's investment in data centre infrastructure to increase over the next ten years, compared to just 8% who expect it to decrease. Nearly three-quarters (72%) of the survey sample said that over the last 12 months, the importance of the data centre had increased for their organisation. Of those, the primary reason cited was 'need faster access to data and services', highlighted by nearly half (49%). This was followed by need to support more connected devices (44%) and those that responded 'need more capacity/flexibility to grow (41%).

> Half of respondents listed security among the most important factors when choosing a data centre supplier

When it comes to choosing a data centre supplier, the survey highlighted the fact security and cost remain the key factors. Half of respondents listed security among the most important factors when choosing a data centre supplier, followed by cost (41%) and connectivity (34%). Network speed was listed by 31% followed by renewable energy (26%).

Interestingly, location was only chosen as a key factor by 15% which goes against the data supporting a move towards more edge computing based models.  Nearly three-quarters (72%) of the survey sample said that over the last 12 months, the importance of the data centre had increased for their organisation

#### Key factors when choosing a data centre supplier



# Sustainability rising up the IT agenda

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82% of respondents say it is either 'important' or 'very important' for their organisation to use data centres powered by renewable energy

Advanced technologies from Al to IoT and data analytics have long been seen as critical in driving sustainable development. Sustainability and renewable energy are increasingly key for IT estates in general and perhaps especially for data centres. More than eight out of ten (82%) of respondents say it is either 'important' or 'very important' for their organisation to use data centres powered by renewable energy, while just 3% say it is not important at all. Nearly half (48%) say that they think renewable energy will make data centres more resilient, twice the proportion (24%) that say they will be less resilient as result.

Moreover, nearly two-thirds (62%) of respondents say their organisation 'monitors the environmental footprint of their IT operations compared to 32% who say they don't and 6% who claim to be unsure.

All of this positivity may come as a surprise to the wider world of business and commerce but it will certainly be far less so for those working in the industry itself. The data centre industry, in particular, has been subject to criticism about the amount of power it consumes and the type of electricity sources used to power its operations (fossil fuels, nuclear power plants or renewables). However, a lot of work is actually being done by the industry to reduce its environmental impact, meaning that it is greener than many people realise. The industry is placing a significant focus on key environmental priorities to ensure that it can continue to serve people and businesses while also doing its part to cut emissions and protect the environment.

Organisations are also optimistic about the EU Commission's vision of data centres becoming climate neutral by 2030. Over half (58%) say that the vision is feasible, while a quarter (26%) say that it is not and 16% are unsure.

## Opinion on the chance of EU Commission's data centres becoming climate neutral by 2030



That's perhaps unsurprising when you consider the work many data centres in recent time in developing their own internal environmental strategies and policies, which often reflect those across the industry more generally. We are seeing data centres demonstrating best practice in energy efficiency and adopting appropriate international ISO standards in Environment and Energy management (ISO 14001:2015 & ISO 50001:2018). They are measuring and reporting energy use and efficiency through the CDP (Carbon Disclosure Project) or equivalents, contractually through the Climate Change Agreements. Some are doing this by obligation through regulatory schemes such as EU ETS (EU Emissions Trading Scheme which captures Scope 1 emissions), ESOS (Energy Saving Opportunities Scheme) and SECR (Streamlined Energy and Carbon Reporting).

More broadly, sustainability has become a key part of the strategic approach of many organisations. 86% of IT decision-makers say it is either very or somewhat important to their IT infrastructure decision-making process. Just 2% say 'it is not important at all'. Yet, when it comes to choosing a data centre supplier, only a quarter (26%) list renewable energy among their most important factors they consider in the choice, well below security (50%) and cost (41%).





## A focus on skills

The ongoing debate around shortage in technology skills continues with recruiters often lamenting the lack of data scientists or candidates with skills in Al and machine learning, for example. The survey found that while IT decision-makers have high confidence in the skills of their own teams, they still believe skills gaps exist across industry more generally. Nine out of ten (90%) of the sample say that they are either 'very' or 'somewhat' confident that their team has the required skills to adapt to new technologies such as edge computing, data analytics and artificial intelligence. Yet only 7% are bold enough to claim: 'there are no IT skills gaps in my organisation'. There is sense from these findings that while organisations feel confident that they have the right IT people in place, they do acknowledge an ongoing need for upskilling and training to ensure that teams have all the right knowledge and aptitudes in place to be fully effective in their roles.

When it comes to assessing the biggest IT skills gaps their organisations are facing, 33% highlight Al, 23% security and 16% data analytics. Data centre management was listed by 11% followed by connectivity (10%). Security is a far bigger concern than Al among businesses with 50 or fewer employees. That priority order is reversed among the larger organisations. Nine out of ten (90%) of the sample say that they are either 'very' or 'somewhat' confident that their team has the required skills to adapt to new technologies such as edge computing, data analytics and artificial intelligence. Yet only 7% are bold enough to claim: 'there are no IT skills gaps in my organisation'

#### The biggest IT skills gaps organisations are facing



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#### Impact of Covid-19: Organisations feeling the pressure but adapting well

IT decision-makers in general felt their organisations had responded well to the pandemic. While there has been disruption to materials supply, and the broader economic impacts of Covid-19 have also impacted the industry, the IT sector has generally been resistant to the worst effects of the coronavirus. Nearly three-quarters of IT decision-makers (74%) said their organisation had the right infrastructure in place to respond to the Covid-19 pandemic and support remote working. That figure grew to 83% among organisations with more than 1,500 employees. Only one in five (20%) said they did not have the right infrastructure.

Covid-19 has also had a significant impact on organisations' digital transformation plans, according to the sample of IT decision-makers polled for this report. 85% of respondents say Covid-19 has impacted their digital transformation efforts. 54% have had to accelerate efforts whilst 31% have had to slow them down. Covid-19 also seems to be driving a significant uptake in cloud computing with many of the leading public cloud providers seeing significant increases in revenue since the virus took hold.

> 91% of the sample experienced infrastructure challenges as a result of the change in working practices driven by the pandemic

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The survey pointed to connectivity to services, 'data security and maintaining uptime' as the biggest challenges driven by the pandemic. 91% of the sample experienced infrastructure challenges as a result of the change in working practices driven by the pandemic. 'Connectivity to services from remote locations' was the biggest infrastructure challenge respondents faced following this change with 16% of the sample referencing it. This was followed by 'maintaining integrity, confidentially and security of data' (referenced by 15%).

74% said their organisation had the right infrastructure in place to respond to the Covid-19 pandemic and support remote working. That figure grew to 83% among organisations with more than 1,500 employees. Only 25% said they did not have the right infrastructure

The survey also revealed that IT decision-makers plan to make changes to connectivity, cloud and data centre models following the pandemic. 91% are planning to make 'changes to their IT infrastructure' following the pandemic while (41%) of respondents said they would 'increase bandwidth/connectivity options'. This was followed by 'accelerate/shift more workloads to the cloud' (38%) and 'increase capacity in the data centre' (34%). Nearly one-third (32%) are planning to 'shift from on-premise to colocation' and 16% plan to 'change the location of their data centre'.





#### Looking to the future: technology and IT Infrastructure trends

There are a whole host of different technologies jostling for attention in today's IT environment, and the survey reflects this diversity. As they look ahead to the next ten years the top five focus areas IT decision-makers highlighted for their organisation were cloud (44%); cyber-security (40%); 5G (29%); artificial intelligence and machine learning (27%) and Big Data (27%). Among organisations with more than 1,500 employees, cyber-security is seen as the biggest focus area (52%) compared to cloud (47%).

Many technologies have huge potential in the data centre space in particular. Artificial Intelligence (AI) is touching almost every industry in one way or another. Through the power of AI, organisations can process and analyse data faster than humanly possible, enabling smarter decision-making with data-driven insights.

As the data centre industry becomes increasingly crucial to the everyday activities of consumers and organisations alike, there are growing opportunities to use AI to manage energy consumption and distribute workloads more efficiently while enhancing cybersecurity measures.

Many obstacles remain, however, standing in the way of the implementation of advanced technologies in the IT space. 88% of the sample in total say they believe they have barriers to adoption of disruptive technologies. Respondents saw 'insufficient budget' as their biggest barrier to the adoption of disruptive technologies like AI and edge computing. 20% of the sample referenced it. This was followed by 'lack of understanding of how to interrogate and consolidate data' (17%) and lack of skills (14%).

The volume of data many organisations are having to manage today is set to grow exponentially. 80% of the survey sample expect the volume to increase in the next 10 years. In fact, three quarters of respondents (75%) expect the volume of data they manage to at least double over the next decade. Only <u>18% believe that</u> it will stay the same.

Growth of data volumes is anticipated to drive greater requirements for greater data centre capacity over the next decade. 70% expect data centre capacity requirements to at least double in the next 10 years. IT decision-makers plan

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significant changes to IT infrastructure strategy in the next 10 years

Remote working is seen as the biggest driver of increased data demands (29%) followed by increased automation of processes (23%) and IoT (20%).

IT decision-makers plan significant changes to IT infrastructure strategy in the next 10 years. Only 5% don't plan to make any changes to their current strategy Over half (51%) plan to migrate applications to a hosted private or public cloud platform and over a third (38%) to outsource infrastructure management to a data centre.



Main drivers behind IT infrastructure investment

Finally, the survey also found that many organisations today are taking a proactive approach to IT infrastructure investment. Only 12% say responding to incident or event is their main driver behind IT infrastructure investment. Nearly a third (32%) see a planned digital transformation strategy as the main driver behind their investment in IT infrastructure, with one fifth (20%) highlighting 'customer demands and requirements' and 18% 'requirement to meet regulation and compliance'.

## Conclusion

As Telehouse celebrates three decades since it opened Telehouse North, its first London data centre, becoming Europe's first colocation provider in the process, it surveys an IT landscape that despite the impact of the pandemic is characterised by robustness, resilience and vigorous growth.

Most IT decision-makers are conscious of infrastructure challenges of course, formulating a list headed up by 'maintaining security and compliance' but also featuring environmental impact of IT infrastructure strongly and acknowledging that this is likely to be a growing issue over time.

Moreover, while the majority of infrastructure is still kept in-house today, there is a strong desire to move away from on-premise. Following the pandemic, nearly one third (32%) are planning to shift from on-premise to colocation and 16% plan to change the location of their data centre. That's not to say centres are expected to become less important over time, of course. In fact, the survey indicates that the reverse is true. 72% of the survey sample said that over the last 12 months, the importance of the data centre had increased for their organisation.

As they look ahead to the future, IT decision-makers see many technologies from cloud to cyber-security technologies to AI having an important role to play

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That said, the sustainability of these data centres is likely to become increasingly important over time. Well over three-quarters (82%) of respondents say it is at the very least important for their organisation to use data centres powered by renewable energy. As they look ahead to the future, IT decision-makers see many technologies from cloud to cyber-security technologies to Al having an important role to play. The prognosis for IT in general seems positive too as Telehouse looks forward to its next ten years, with many organisations looking proactively at IT infrastructure investment to drive digital transformation. Here's to the next 30 years.



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