



Microsoft

# The future of infrastructure and connectivity in a cloud-centric world

Our research details how leading organisations use network infrastructure today, and how they plan to use it tomorrow.



# Foreword

Global organisations know their future lies in the cloud and have already moved some workloads there. They might not have a fully defined picture of how to handle sensitive data in the cloud yet, but they want to be prepared, and they're scoping out the possibilities. There's a definite sense that we're at a tipping point that could determine how successfully organisations prepare for what's next.

We commissioned a global research study with Microsoft to assess where networks are today, and how ready they are for the needs of tomorrow. Seven hundred business and IT leaders working in global organisations shared their opinions and insights.

The key point that emerged is that all eyes are on the network to support the cloud vision – but most networks are coming up short, unable to support the connectivity, new technologies and ecosystem access that's needed.

Organisations are also eager to ensure sustainability is a fundamental component of their network development plans, recognising that any change is an opportunity to operate in a more energy efficient and green way. Cost is an ever-present issue too, and organisations are interested in exploring flexible commercials.

The bottom line is organisations want a cost-effective and secure network that can keep pace with emerging technologies. A network that lets them support the experimentation and exploration that pushes boundaries and creates differentiation in a cloud-centric world. And one that never stops underpinning mission-critical

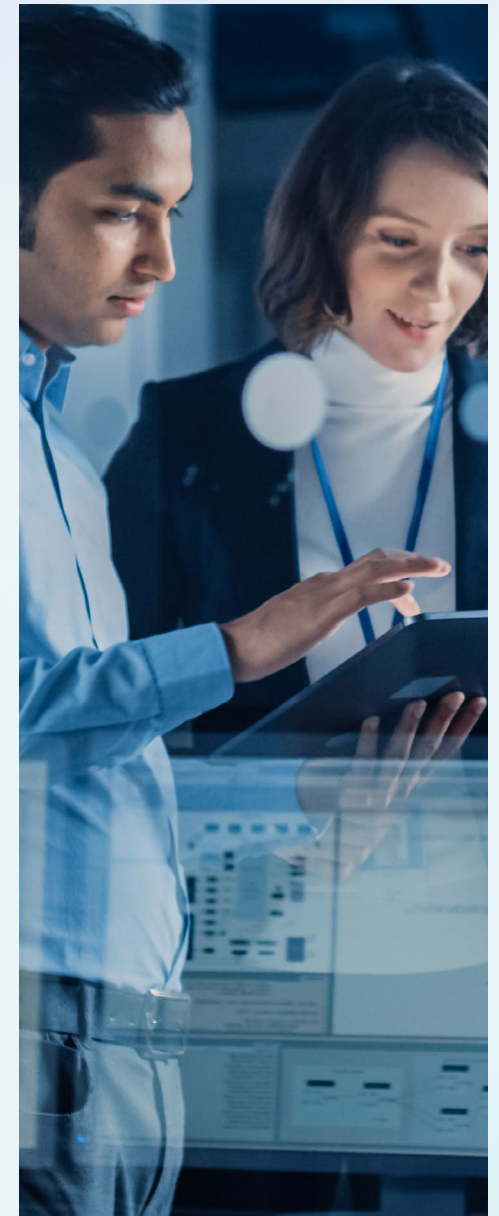
applications that are the lifeblood of their business.

What stands out from the research is how important cloud ecosystems are going to be – and the role network infrastructure will play in providing the end-to-end solutions, security, management and scale needed to operate in the distributed multi-cloud environments of the future.

By highlighting where business and IT leaders need to focus, our research shows a clear pathway to a network that's ready to operate with the cloud.

**Colin Bannon**  
**Global Chief Technology Officer, BT**

## Take your next step towards preparing for a cloud-based world today.



# Executive summary

Business and IT leaders in global organisations are operating in the cloud, but are increasingly realising that their networks aren't optimally set up for cloud-based applications. This is a pressing issue that's driving many organisations to revise their networks and connectivity to establish the foundations they need to operate in a cloud-centric world. There's a clear role for an infrastructure partner that can deliver end-to-end solutions that help organisations overcome barriers.

## **Organisations are struggling to achieve their goals with their current networks**

Current networks aren't delivering the performance, coverage and density needed to adopt new technologies and operate securely in multi-cloud environments. Network limitations are stopping 65% of organisations from deploying new business applications, with 87% of business and IT leaders saying that adopting big data, the Internet of Things (IoT) and Artificial Intelligence (AI) will require a network upgrade.

## **Simple, reliable ways to achieve choice and flexibility within networks are important**

IT leaders are seeking solutions to the complexity associated with configuring routing and security rules as well as for compliance and consistency across cloud tenants and their physical estate. Delivering this functionality is likely to involve building in a programmable automated underlay to support the real-time provision of network assets and burstable bandwidth.

Latency Service Level Agreements (SLAs) are important to 93% of IT leaders.

## **Hybrid SD-WAN solutions are addressing issues around network transparency**

While just under 40% of organisations expect to continue to rely on private cloud, over 60% of them predict a future infrastructure that's primarily internet based, with SD-WAN, SASE and other solutions enabling private secure connectivity and reach to the cloud. SD-WAN is chosen to achieve control across the overlay and underlay, with performance entirely dependent on the latter, including the ability to automate issues and changing requirements across both.

## **Organisations are looking for flexibility**

Flexibility is important in today's environment. Organisations want to be able to right-size, terminate and add new services easily. They're looking for a self-service network with on demand options, without the need to work to a set contract based

on a fixed number of sites, locations and throughputs. IT leaders want this flexibility to extend to commercials, so they can choose a pay-as-you-use approach.

## **Sustainability is a significant factor when building IT and network infrastructure**

Organisations will ask challenging questions about sustainability delivery as part of any network infrastructure transformation, with 94% considering sustainability considerations important to strategy. There's a clear expectation that cloudification is key to unlocking sustainability benefits such as reduced CO2 emissions.



# Insight one

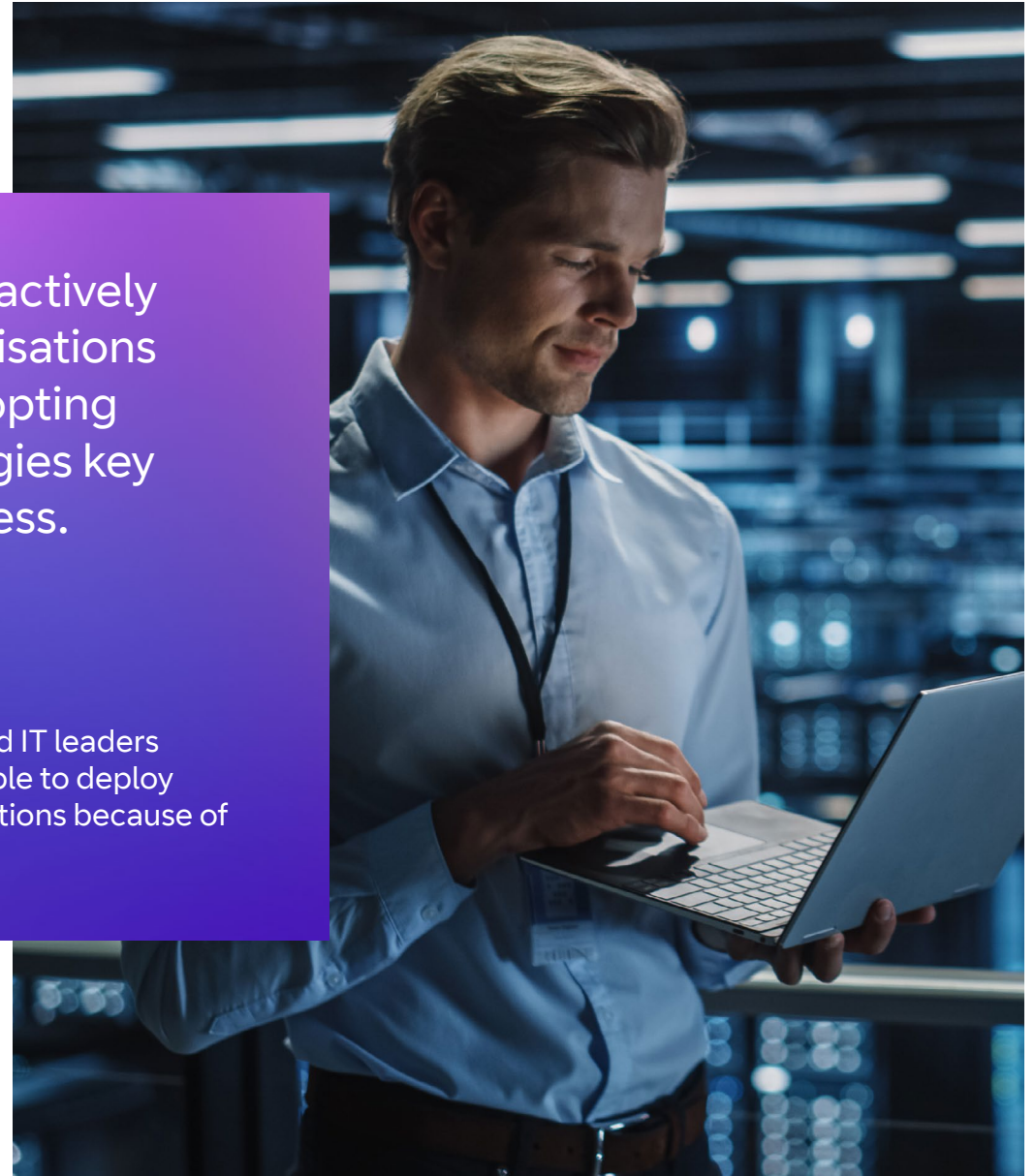
Organisations are struggling to achieve networks that can support emerging technologies and securely connect to all the clouds where they want to use them.

It's striking to see the extent to which today's networks aren't fully meeting organisations' needs. Across the board, over half of all business leaders rated aspects of their networks as less than excellent, with speed, security, performance consistency and ease of access triggering the most dissatisfaction.

Networks are actively holding organisations back from adopting new technologies key to future success.

# 65%

of global business and IT leaders revealed they're unable to deploy new business applications because of network limitations.





Drivers for an IT and network infrastructure upgrade focus on technologies that depend upon being directly paired to the cloud, with 87% of business and IT leaders saying that adopting big data, the IoT and AI will require a network upgrade.

Cloud pairing is particularly relevant for organisations using a lot of Software-as-a-Service (SaaS) applications and business critical apps that are hosted in the cloud, or those with complex cloud estates who are moving large amounts of data between clouds, or from sites to cloud, and requiring a secure path to connect application endpoints.

Critical connectivity must be protected, so they need a low latency, high bandwidth, flexible, SLA-backed network that performs even under failure. A network with near-real-time reporting will give them the visibility they need, even before issues occur, to allow efficient responses to any potential service degradation. Ideally, organisations would also have the flexibility to move between network services seamlessly and digitally, without the need to cease and provide.

Security is understandably of significant concern, with 96% of organisations having experienced a network security breach in the past 12 months, making security a major part of the desire to improve the network. Customers tell us that the ideal network infrastructure security provides holistic protection – from Proof of Concept (POC) to early lifecycle, and throughout its in-life service.

Data security and sovereignty is prompting network upgrades.

91%

of business and IT leaders identify improving data security and data sovereignty as a likely technical reason for a network upgrade.



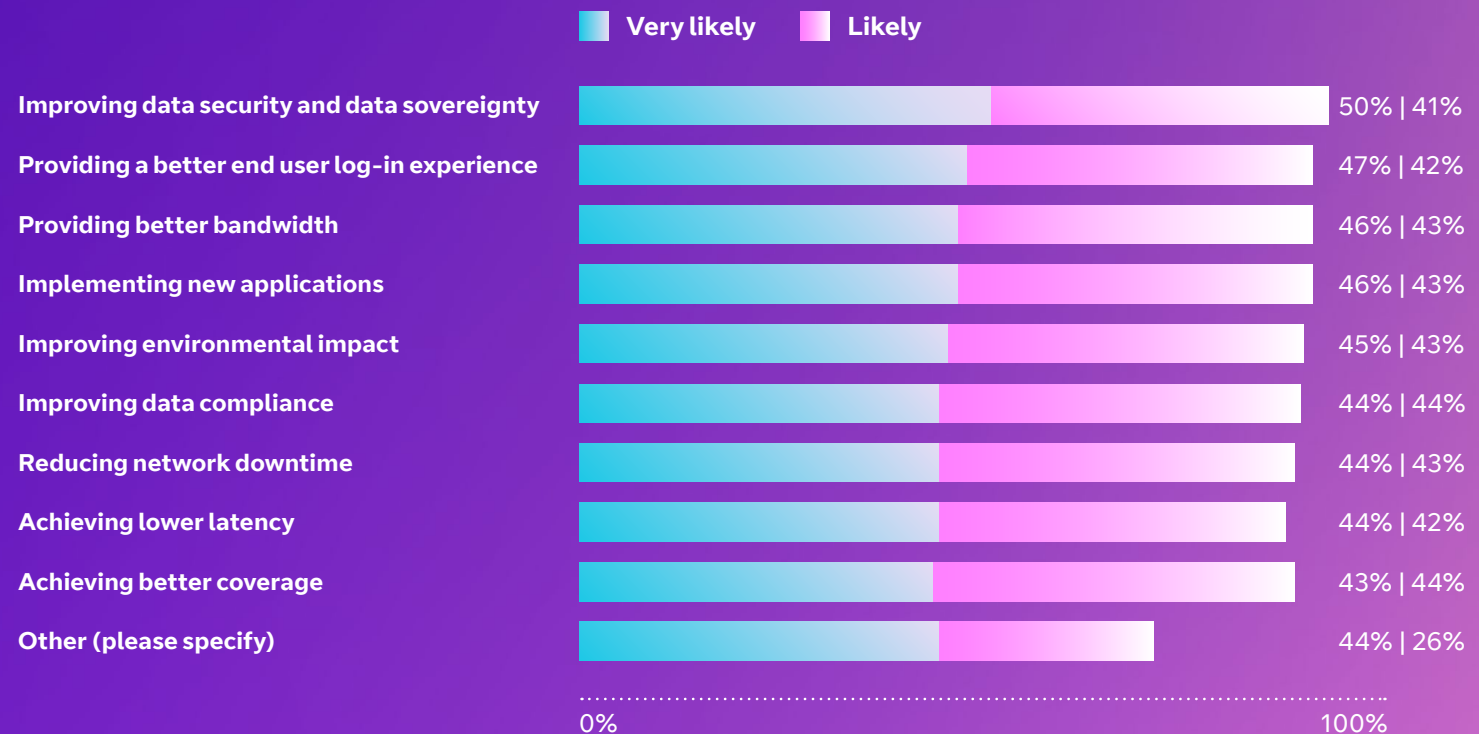
Today's network infrastructures need to support SaaS and cloud storage services at key Points of Presence (PoPs) around the world. Together with increasing penalties for failing to comply with data protection regulations, this is a powerful motivator for change.

As organisations try to address issues with data sovereignty as it relates to their network architecture, they primarily (66%) characterise their current solutions as having data and apps largely deployed in and between clouds, or with sensitive apps and data stored at the cloud edge interacting with cloud applications.

Organisations value and want a network that can deliver a high-quality, high-performance experience across all development lifecycles. They place particular emphasis on better bandwidth, improved latency and the ability to achieve better coverage. And they want a network that's able to implement new applications, reflecting how few existing infrastructures are fit for purpose.

## Technical and compliance drivers for network upgrades

Which of the following technical reasons are likely to cause your organisation to upgrade its IT and network infrastructure?



Organisations need to upgrade their networks to allow them to digitally transform and operate in a secure multi-cloud environment. So what's delaying or stopping them?

Predictably, cost led the way, with a lack of ongoing investment to develop and extend services cited by 40% of business and IT leaders, with a third also mentioning insufficient initial investment.

Failed  
POC exercises  
are putting  
the brakes  
on network  
upgrades.

**31%**

of business and IT  
leaders held a failed POC  
responsible for cancelled  
upgrade plans.

This highlights how today's infrastructures don't lend themselves well to supporting realistic POCs, mainly because they don't offer the flexibility to spin projects up and down to test its performance through its likely lifecycle.

Vendor support also emerged as an opportunity for vendors to work more closely with customers on their network infrastructure upgrades. Just under a third (29%) of business and IT leaders called out its importance, reflecting the need for supportive, competent governance around projects and a strong vendor-customer partnership approach.

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## Key takeaway

Legacy networks aren't delivering the performance, coverage and density that organisations need to operate securely in a multi-cloud environment.

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# Insight two

Organisations are looking for simple and reliable ways to achieve choice and flexibility within their network.

Cloudification is the next step in network evolution. It enhances network virtualisation technologies so they can leverage the power of cloud platforms and technologies, particularly the rich media applications that are growing at the network edge, to fully reap the business value of cloud.

IT leaders need solutions to address the complexity issues associated with configuring routing and security rules, remote site management and change control, with these factors being given equal ranking.

IT leaders want certainty and are looking for rigorous network SLAs. As they adopt new technologies dependent on rapid connections, latency rises to the top of their agenda.

A guaranteed SLA of 'x' millisecond latency is important for business.

**93%**

of IT leaders rated it as important.





Delivering these SLAs will require a network that provides predictive fault resolution and redundancy, for performance under failure, so downtime is reduced. Increasingly, organisations will choose a programmable network to achieve this, one that has software-defined policies to control routing in real time and self-service tools to centrally monitor and manage cloud connections.

To maximise the responsiveness and flexibility of the future network, IT leaders are extremely interested in being able to control it themselves. They want to be able to determine the end-to-end path of their data, avoiding routes that may breach regulatory and data sovereignty compliance. Plus they want ways to spin connections up and down to different clouds on demand as well as the ability to flex their bandwidth easily.

Interest is growing in self-service network functionality.

93%

of IT leaders were interested in a self-service network with on-demand options across various connectivity solutions.

IT leaders are looking for ways to improve application performance, preferably with SLA guarantees. A more automated underlay will develop network functionality and this, in turn, will improve the quality of experience.

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## Key takeaway

Delivering the functionality that organisations need and want is likely to involve building in a programmable automated underlay to support the real-time provision of network assets and burstable bandwidth.

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# Insight three

Organisations are turning to hybrid SD-WAN solutions to address issues around network transparency.

Cloud is an established part of network infrastructure, and it's taking on a growing share of the network burden. Most organisations now describe themselves as cloud-centric, as either cloud native (35%) or early adopters with high cloud maturity (49%).

Cloud-based networks are the future.

86%

of organisations are planning to move most or all of their IT infrastructure and applications to the cloud within the next five years.

Cloud interoperability is clearly increasingly relevant to organisations.

Cloud integration is considered a top priority for organisations planning their transformation strategy, rivalled only by security considerations.

Over 60% of organisations predict a future infrastructure that's primarily internet based, with SD-WAN, SASE and other solutions enabling private secure connectivity and reach to the cloud. Another 37% expect to remain in their private global WAN architecture with breakout to key clouds, the internet and SaaS providers due to private cloud's inherent reliability and security.

The twin focuses of security and cloud integration surface again as the most mentioned aspects in IT leaders' top three priorities when it comes to planning SD-WAN transformation strategies – security (15%) and cloud integration (15%) were closely followed by digital applications (13%).

## Drivers of transformation strategies

When planning your (SD-WAN) transformation strategy, what is/was your top priority?

Select top 3, share of choice (IT Execs)

	% share
Security	15
Cloud integration	15
Digital applications	13
Integration with existing infrastructure	12
Reducing costs	12
Traffic visibility and monitoring	12
Identifying the right partner to work with	11
Available in-house expertise	11





SASE popularity is growing alongside cloud-based SD-WAN.

25%

of IT leaders rate firewalls as the most popular SASE item.

With the well-documented increase in agile working since the pandemic, organisations are looking for a single solution for their SD-WAN and security needs.

Organisations are further looking for solutions that allow control of performance across both overlay and underlay, including the ability to triage across both without the need for ticket passing. There's also a need for tools that can centrally monitor and manage multiple direct cloud connections as well as security policies that can be enforced over a multi-cloud environment as well as in an app-to-app set up.

Organisations want access to an ecosystem of cloud providers.

48%

of organisations consider a single marketplace with cloud products and services (including third parties), and data centre locations, very valuable to the business.

This suggests that SASE and SD-WAN operate as a package, with SASE tapping into security funding, making an SD-WAN business case more attractive. It also supports a comprehensive approach to funding at a macro level, looking at network and IT funding together.

Organisations are now looking primarily for cloud-based firewall solutions, with 80% indicating that this is their preference compared to out-of-the-box solutions.

The growing popularity of SASE reflects organisations' desire for a more capable, efficient, self-determined network, with 98% of IT leaders saying network transparency would benefit from the adoption of a SASE solution.



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## Key takeaway

Realising a transparent, efficient cloud-based network will need strong interoperability with underlay services. Effective access to an ecosystem of providers and reliable automation are priorities for organisations.

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# Insight four

Organisations want the flexibility they're aiming for in their network infrastructure to be carried through to their commercials.

It's unsurprising that cost is top of mind in today's financial and operating landscapes, meaning organisations are keeping a close eye on their overall IT and infrastructure spending.

Cost is both an inhibitor of, and a driver for, change. We've already covered how the cost of initial and ongoing investments is holding transformation projects back, but the prospect of reducing costs can also be a motivator for investment.

Key messaging around the flexibility of cloud-like commercials and the ability to avoid contract lock-in are particularly effective.

IT leaders research prospective vendors carefully, using a variety of methods. Interestingly, social media is one of the three top methods (37%), along with internal research teams (37%) and supplier / partner websites (36%). This is a timely reminder for supplier organisations of the importance of a strong, regular and informative social media / digital media presence.



Potential cost savings entice network transformation.

When it comes to driving multi-cloud journeys,

74%

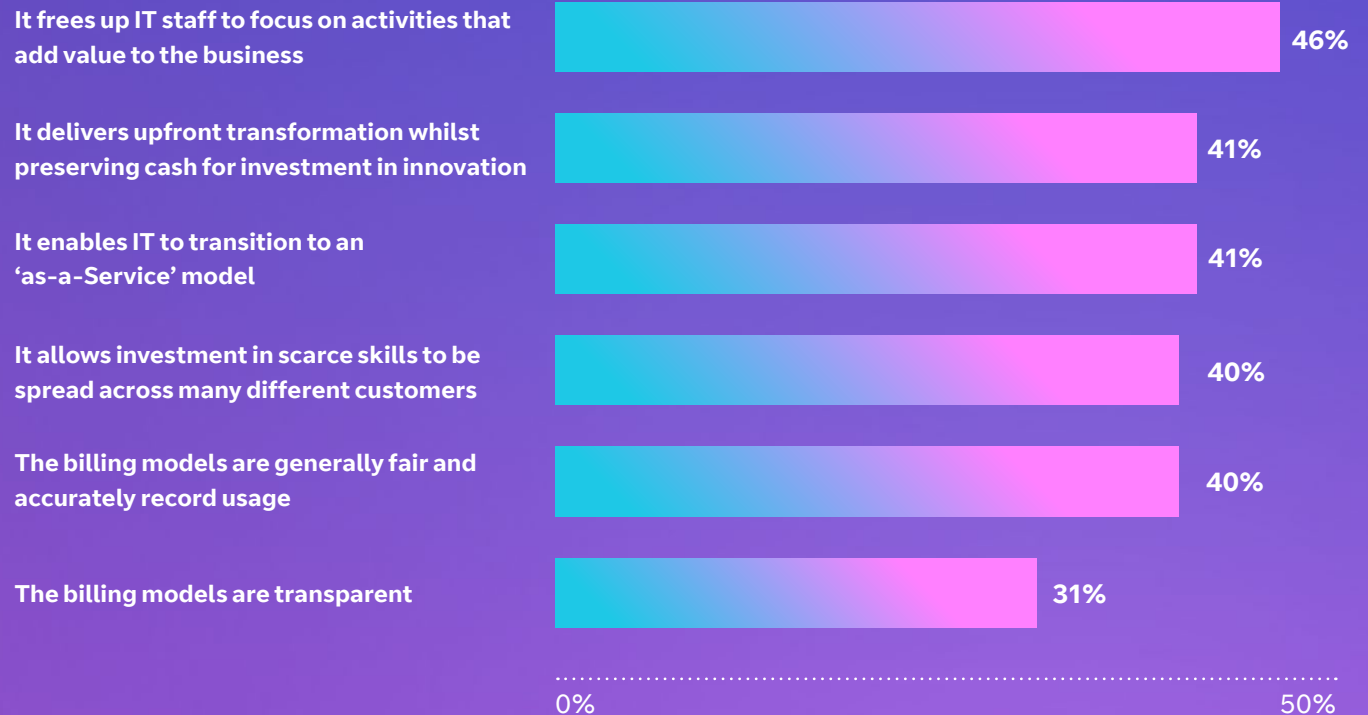
of IT leaders want the combined ability to switch from one provider to another and negotiate a better price.

The themes of cost, investment and value are the most consistent reasons for choosing an 'as-a-service' solution.

## Perceptions of 'as-a-service' benefits

What do you feel is the top benefit when using an 'as-a-service' for your organisation?

(Business Execs)





## What do organisations believe will deliver the value they're looking for?

Flexibility leads the way. The top two main drivers for organisations on a multi-cloud journey are the flexibility of being able to switch easily between vendors (37%) and price flexibility via the ability to negotiate better pricing (37%).

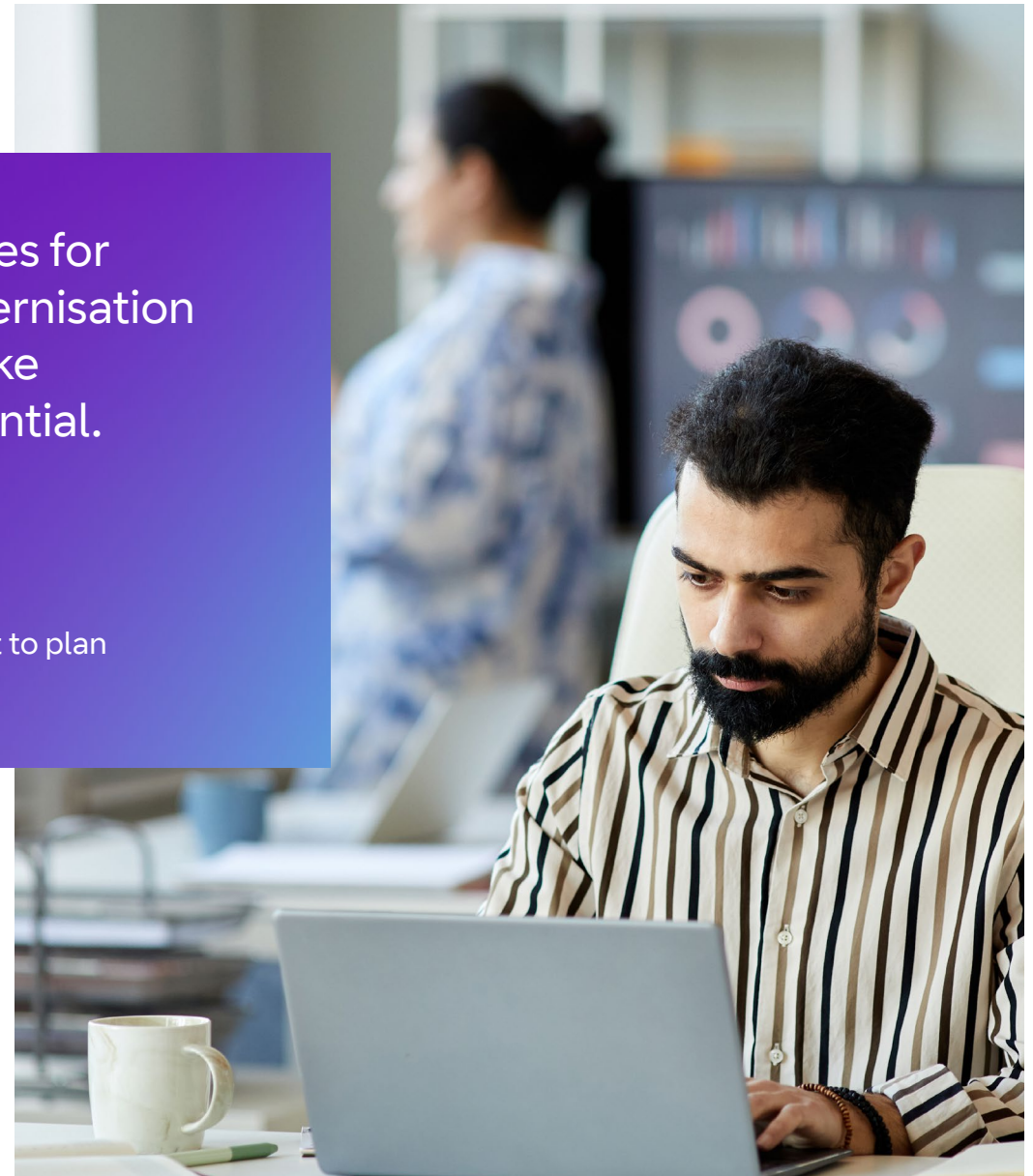
Considering that over 90% of IT leaders see a self-service network with on demand options as a reason for future investment underlines the attraction of flexibility. A picture emerges that organisations want control and flex over their cloud networks, with the ability to carry out in life changes, and they don't want to be locked into contracts. A multi-vendor approach lets the organisation choose the right vendor for every location.

The ideal approach is to move away from a traditional framework contract, placed with a preferred provider based on a known number of sites, locations, throughputs.

Long lead times for defining modernisation strategies make flexibility essential.

**83%**

of organisations start to plan 1-3 years in advance.



Set-in-stone contracts aren't sufficiently flexible when taking a cloud-first approach. Instead, organisations want to combine a framework contract in conjunction with a top tier partner that includes a flexible service model and the integration they need.

Organisations also want the flexibility to determine a bespoke balance between insourcing and outsourcing. Preferences are roughly equal, with 44% wanting to pursue a fully in-house design, delivery and management strategy for their IT and networking services, and 43% wanting to pursue a pick and mix approach of in-house and managed services.

When it comes to identifying an innovative and visionary IT, cloud and network infrastructure provider, our strategic partner, hyperscaler Microsoft leads the way (13%), followed by Amazon (12%) and Google, IBM and Oracle, all on 11%. This close spread of results indicates that organisations would be happiest with access to an ecosystem that could connect them to a range of hyperscalers and partners.

The ability to reduce commercial dependency on hyperscalers is also attractive for organisations looking to manage spend and budgets, as is the ability to manage egress charges as they move data from the cloud. This all points to the importance of having a TCO model that looks at end-to-end costs and considers the entire infrastructure.

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## Key takeaway

It's critical organisations can easily right-size, terminate and add new services. Today's organisation sees commercial flexibility as a pay-as-you-use solution that's scalable with assured performance – all with predictability on price.

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# Insight five

Organisations are motivated to make their IT and network infrastructure more sustainable.

Increasingly, sustainability has turned from a nice-to-have, to an essential part of corporate strategy. ESG (Environmental, Social, and Governance) concerns are integral to decision making across the business as organisations realise that demonstrating sustainable practices and processes is becoming an important factor to customers, investors, and employees.

Proven sustainability policies and outcomes, robust measurement and reporting and a whole-organisation commitment are essential. IT leaders need the ability to measure the impact of the network against their ESG commitments. They need suppliers who are able to provide sustainable products with end-of-life recycling schemes and solutions powered by renewable energies, reducing their operational environmental footprint.

Organisations are looking for network solutions that can deliver sustainability benefits, such as reduced CO2 emissions, with a clear understanding that cloudification is the key to unlocking this. What stands out is that business and IT leaders expect all aspects of cloudification to be able to contribute to sustainability, from cloud native application architecture through to power and cooling.

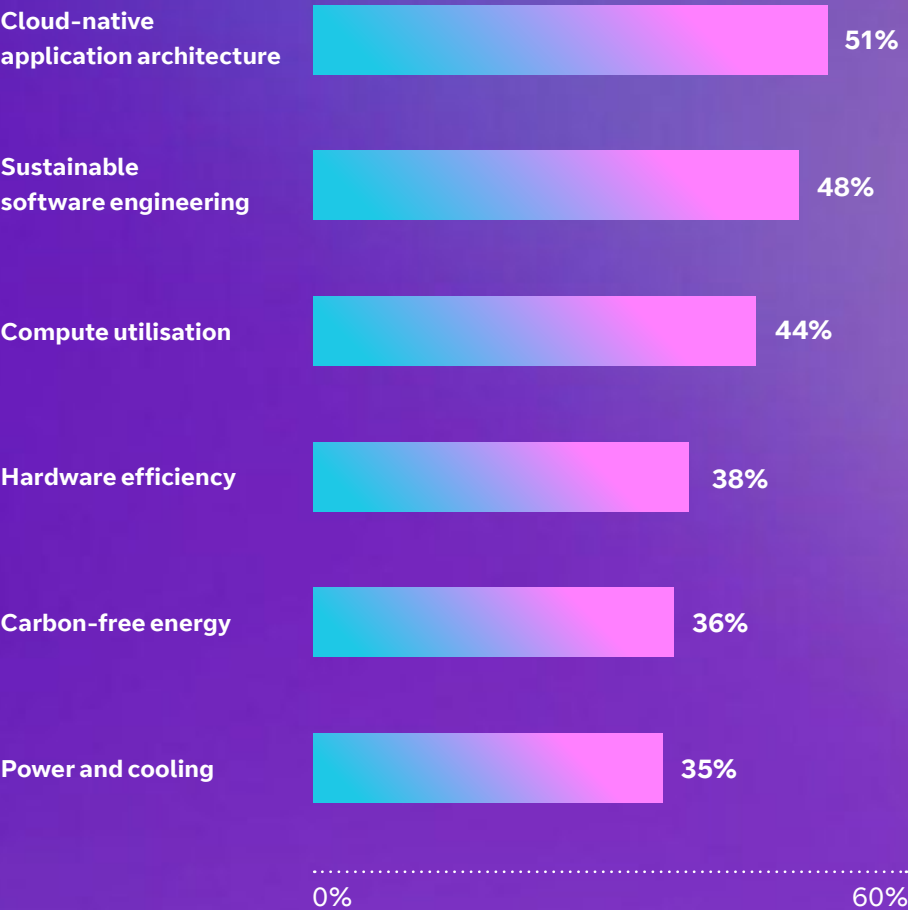
There’s near universal recognition that sustainability is critical.

94%

of business and IT leaders consider sustainability considerations important to an organisation’s IT and network infrastructure strategy.

## Cloud impacts on sustainability

In which areas do you feel cloud can make the biggest impact in terms of sustainability for your organisation? (IT Execs)





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Key takeaway  
Organisations  
will ask  
challenging  
questions about  
sustainability  
delivery as part  
of any network  
infrastructure  
transformation.

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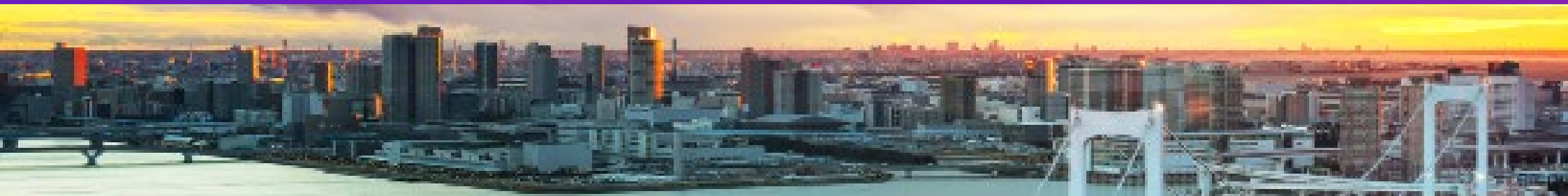


# Conclusion

Our research demonstrates that what's needed is a network designed and built to provide a strong and secure foundation for your applications, devices and data. You can then connect and protect what matters most - your customers, people, partners.

A next generation programmable, predictable, secure, sustainable, cost effective, cloud-centric network that's built to address customers' emerging needs. This network should have an optimised global footprint to give the speed and service where they need it most.

- With the slowdown of the global economy, commercial flexibility is priceless. The ability to have flexible requirements to adapt to the shifting requirements of the market is now a key purchasing driver.
- Some traditional managed services are inflexible, difficult to scale and have long lead times. Organisations need real-time flexible network management along with digital managed services.
- Traditional networks don't provide the flexibility needed to support distributed workloads across a hybrid infrastructure. Organisations need a solution that will optimise their application performance across their hybrid estates.
- SD-WAN overlay performance is only as good as underlay performance. Having a programmable, software-defined, intelligent underlay, which allows for better co-ordination with the SD-WAN overlay, must be the focus for network developments.
- The shifting tide around data sovereignty and the wider regulatory environment means that organisations have regulatory requirements to address, and require solutions such as intelligent routing and resilience in peering within regions.
- Organisations continue to need secure solutions but they now also need rapid deployment options, as well as opportunities to improve the performance of cloud delivered security controls.
- Sustainability continues to be a key part of an organisation's strategic priorities. Modern network solutions need to both allow for reduced emissions as well as an accounting methodology for green house gases.



# Last word

What stands out from this research is how organisations are hesitating to make the full cloud transformation journey due to a lack of confidence in key areas.

Take data sovereignty. Understandably, global organisations have data regulation concerns, so they need a network architecture to give them confidence to hold data wherever suits them best – at the cloud edge, or in the cloud. Control over your data's trajectory is paramount so you need to build a network that makes data governance, control and management easy.

We noted, too, that some organisations lack the confidence to make the leap to cloudification. They'd welcome easy opportunities to run POC trials, to give them the freedom to assess major investments at low risk and choose the options that work best for them.

Confidence in low latency levels also stands out as important to today's global organisation, determining whether connectivity can support the applications and workloads the business needs.

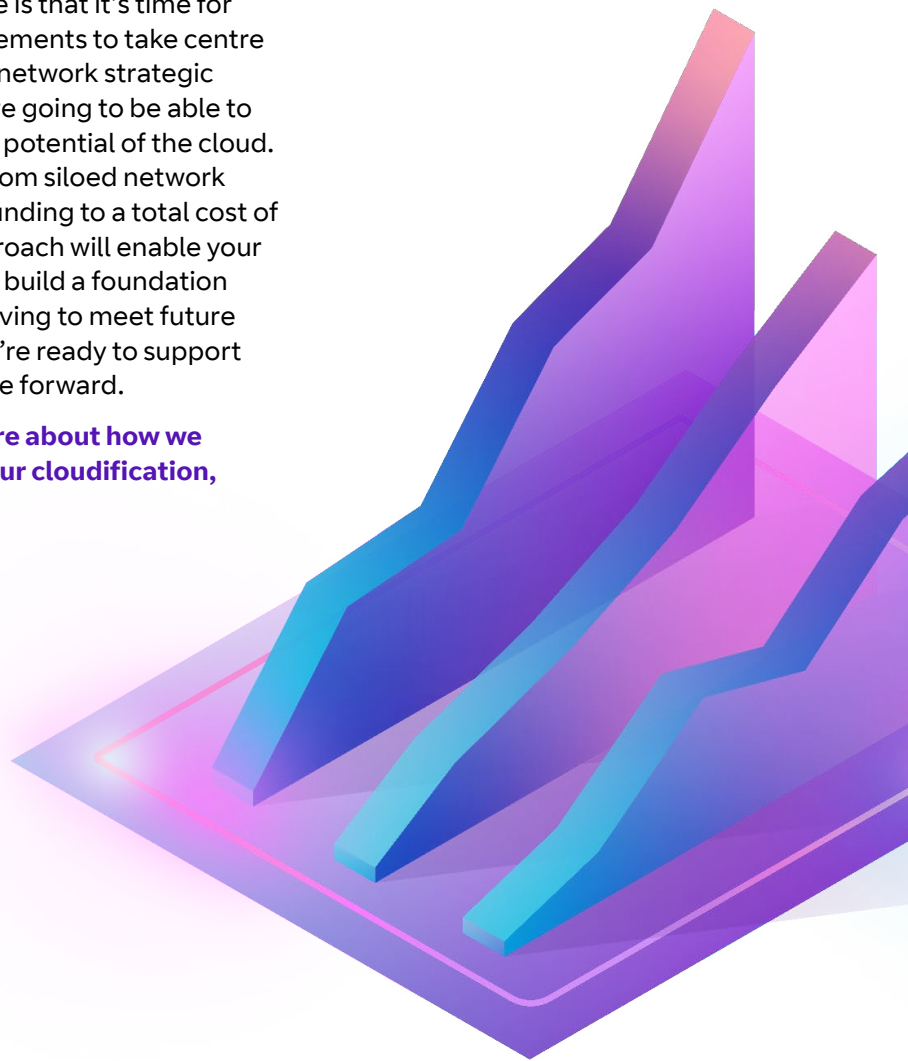
It's clear that IT leaders want certainty and are looking for rigorous network SLAs to support new technologies dependent on rapid connections. They need a network with built in dependability because trust and confidence grows with positive experiences.

New networks must also align a programmable automated underlay with the overlay to deliver better vertical support and performance delivery. Plus, they need to be on demand, so organisations can choose to check configurations and performance at scale, further boosting confidence and minimising risk.

As your organisation moves towards the new world of cloudification, access to support and expertise will be critical. We see a significant difference here between the limited support that point-product vendors can offer and a comprehensive approach. Global organisations need to choose a partner with services that help them thrive, and bring a strong track record of innovation, delivery, support and choice.

The bottom line is that it's time for network requirements to take centre stage in IT and network strategic thinking if you're going to be able to fully realise the potential of the cloud. Moving away from siloed network planning and funding to a total cost of ownership approach will enable your organisation to build a foundation capable of evolving to meet future needs – and we're ready to support you as you move forward.

**To find out more about how we can support your cloudification, get in touch.**







**Microsoft**

### **Research methodology**

This research was carried out independently for BT and Microsoft by independent research company Davies Hickman Partners. They surveyed 700 global business and IT leaders in eight countries (Australia, France, Germany, Japan, the Netherlands, Switzerland, the UK and the USA).

### **Offices Worldwide**

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