NTT

The future of the network

The fabric of your digital organization

an NTT company

> The rise of the distributed workforce, as well as adoption of new digital customer channels has seen huge strides towards the edge.
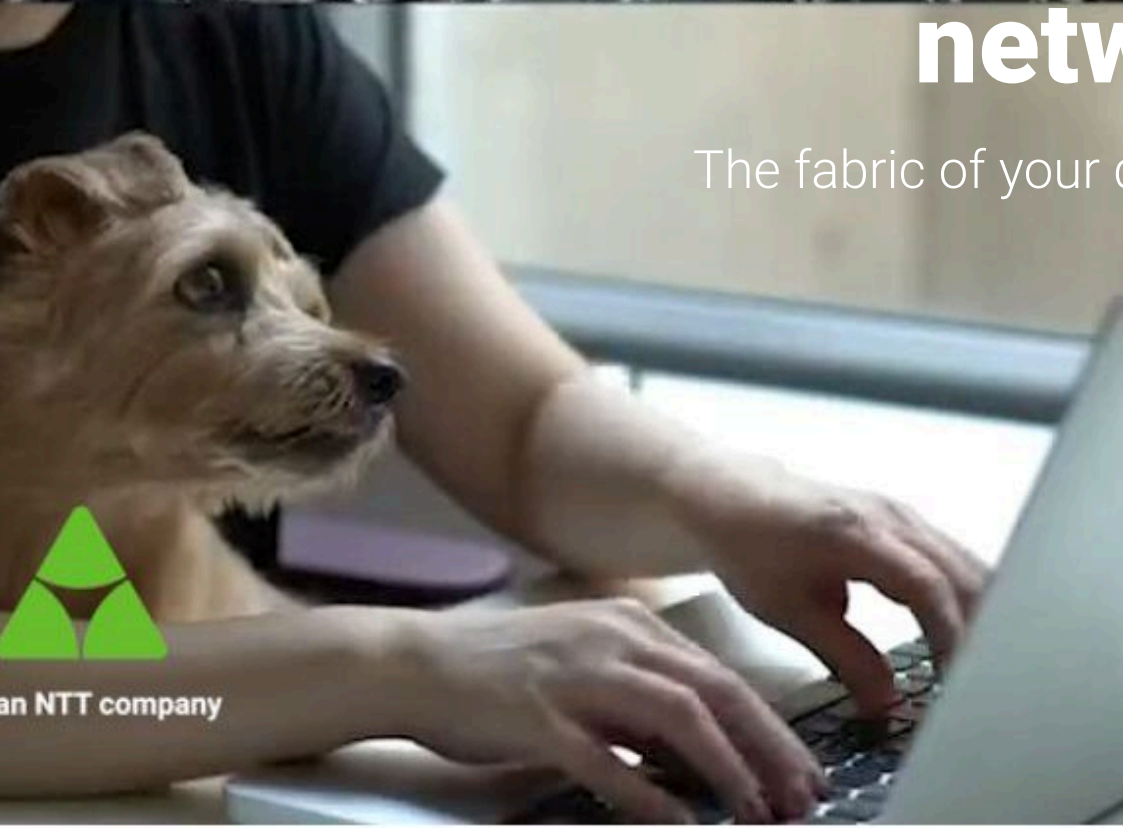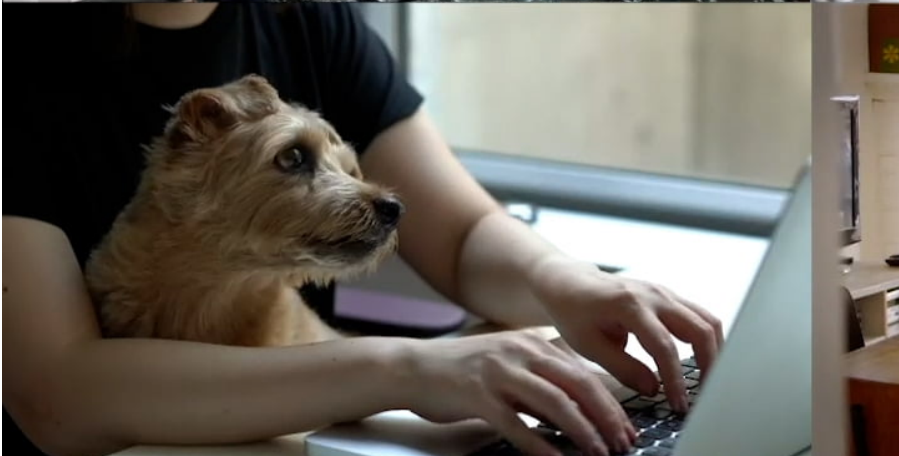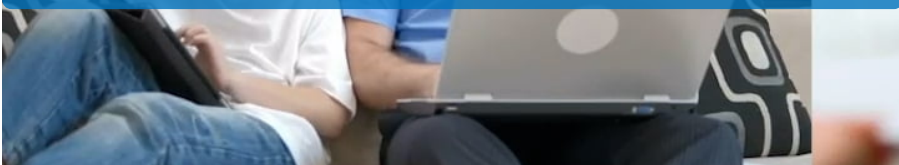
Challenges associated with network performance or availability are seen as the second biggest barrier to adopting hybrid cloud.
2021 Hybrid Cloud Report

While organizations have been digitally transforming for some time, that need has grown exponentially in the last 12 months. Our recent 2021 Global Managed Services Report highlights how 87.3% of business and IT leaders agree the global pandemic has accelerated their digital transformation strategy. The world has changed significantly and organizations have an imperative to adapt and change, or meet the consequences head on.

The need to deliver better experiences to both customers and employees is upmost on the minds of many IT leaders. The rise of the distributed workforce, as well as adoption of new digital customer channels has seen huge strides towards the edge. To gain any form of competitive advantage and to deliver on those needs, organizations need faster, more local access to data and the ability to process it securely in order to make better decisions. This increased agility, performance and availability also helps to better combat against unexpected events, reduce risk and drive sustainability. These are the cornerstones propelling organizations in today's digital economy.
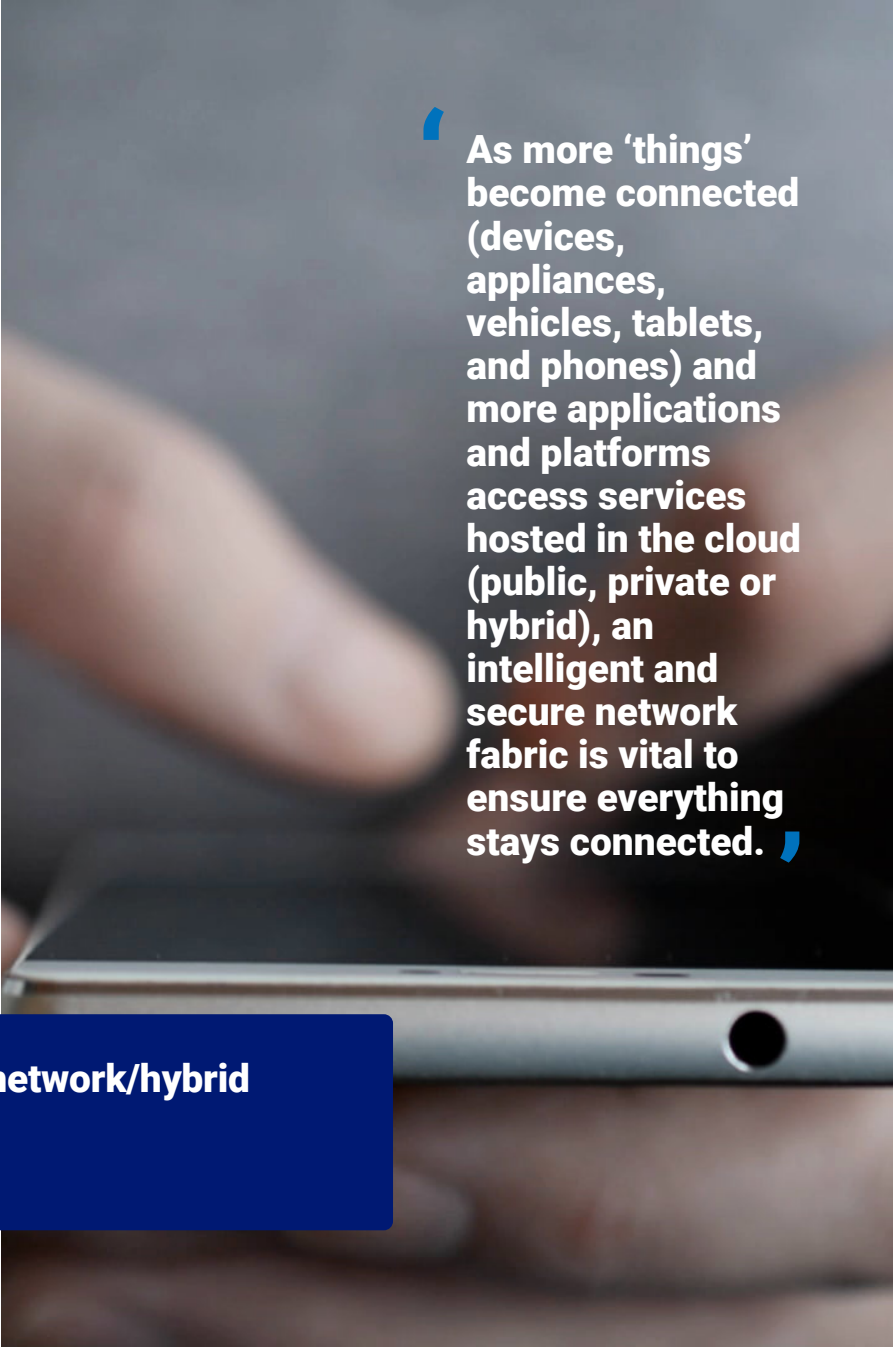
With business models changing significantly, IT has had to evolve more broadly too, supporting the organization every step of the way. And while cloud has played a major role in enabling transformational change, workloads and data processing is also moving to the edge. In short, IT is facilitating the demand to be better connected in what is a globally distributed and fast-paced world where computing, applications, devices and users are everywhere.

Leverage hybrid infrastructure through the network fabric

To meet this demand, businesses are embracing hybrid approaches and placing critical applications and workloads (be they systems of record, insight or engagement) in the most appropriate venues – cloud, hosted or on-premises - to realize better outcomes. And as hybrid infrastructure has become the foundation for business applications, the network fabric enables connectivity across hybrid solutions. It is no longer a mere functional item. The network is the fabric of your organization, a platform for digital transformation.

A smart approach to IoT devices

As more 'things' become connected (devices, appliances, vehicles, tablets, phones etc.) and more applications and platforms access services hosted in the cloud (public, private or hybrid), an intelligent and secure network fabric is vital to ensure everything stays connected. That is connecting edge devices and things (within smart workplaces, smart hospitals, smart manufacturing), connecting edge to the cloud and then into and across the different clouds. This ultimately powers the smarter, digital world we now live in.

'As more 'things' become connected (devices, appliances, vehicles, tablets, and phones) and more applications and platforms access services hosted in the cloud (public, private or hybrid), an intelligent and secure network fabric is vital to ensure everything stays connected.'

52.4% of leaders say that advancing digital transformation will cause network/hybrid infrastructure skill needs to increase in the next 2 years.
2021 Global Managed Services Report

Why an intelligent network?

Networks have undergone significant transformation in recent times. The requirement for greater flexibility, performance and intelligence is being driven by the need to deliver on the plethora of business requirements. This has seen networks become software-defined, automated and programmable, which in turn provides visibility of traffic flowing across the network and deep advanced network and predictive analytics. This affords greater operational efficiencies and richer insights around application performance and end-to-end lifecycle services for example.

> **This leads to a more fundamental and robust infrastructure that can deliver on your wider digital transformation outcomes.**

The evolution of the network goes beyond technology to include operations and consumption models and thereby providing much more choice across the networking landscape. Networks can be licensed in a variety of ways, including capex or opex, as well as subscription and consumption pricing options. This choice, along with the availability of advanced insights and access to deeper functionality, enables you to intelligently manoeuvre critical technical, operational, and financial transformation levers. This leads to a more fundamental and robust infrastructure that can deliver on your wider digital transformation outcomes.
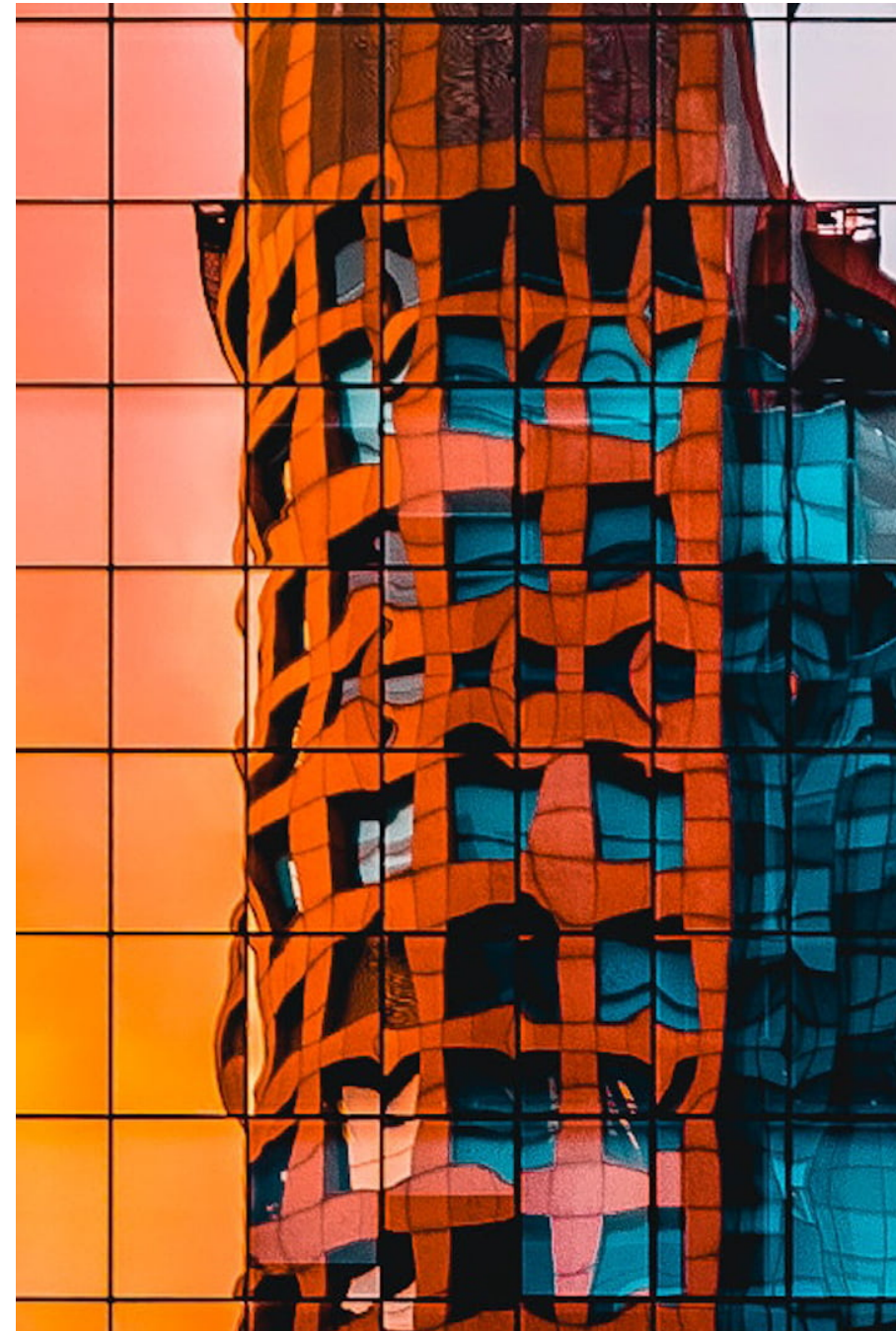
Secure by design

Traditionally, networks, security and applications have been architected independently of each other, causing huge implications for organizational agility. A network that has security controls embedded and is 'secure by design' ensures it is secure from the very foundation upon which it was built. Network security, risk management and network operation are simplified by constructing these elements into the network core DNA, taking into account the type of applications, data and systems your organization uses.

This not only means network security and risk levels are met and that you're in line with your governance and approval processes, but that crucially, it doesn't come at the expense of agility. Your organization needs to enable transformation at speed, but without compromising security or governance, which can still be maintained at the edge, in the data center and in the cloud.

Security is the top focus area for network infrastructure over the next 18 months.
2021 Global Managed Services Report
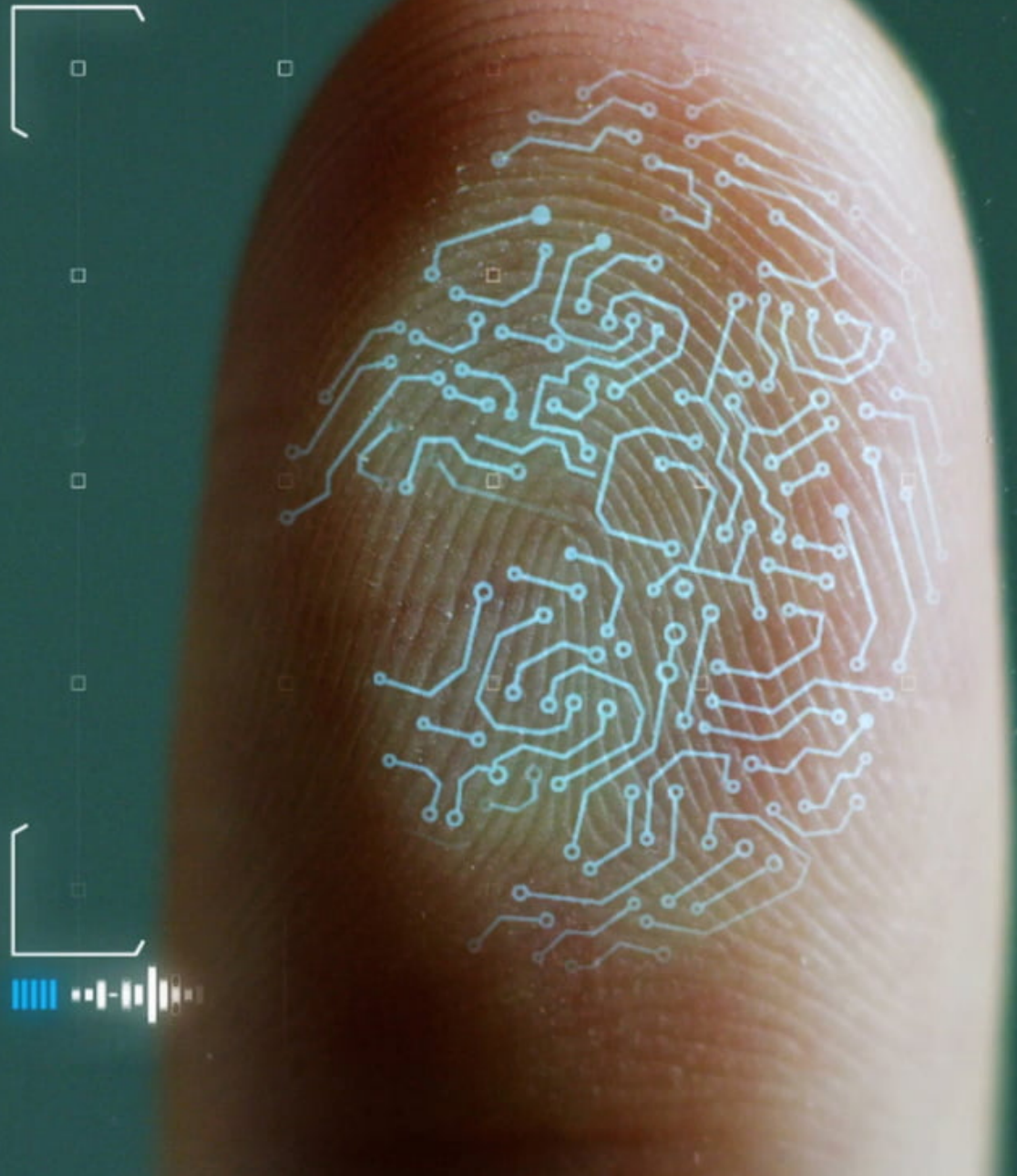
Network complexity is commonplace

Yet despite the advances towards an intelligent and secure network, network complexity can still hold your organization back. Lack of agility is commonplace as organizations react and respond to changes brought about by a shifting business environment, e.g. the move to remote working or the need to rapidly open new locations to support expansion; not to mention the demands of the business as part of the drive to a software-driven enterprise. And with cloud investments outpacing on-premises infrastructure spend, refresh and upgrade patterns are slowing down. Ageing networks are under pressure from the explosion of data, the drive to the Internet of Things (IoT) and increased user expectations and won't deliver what is needed by the business.

Almost half (47.9%) of businesses' network infrastructure assets were ageing or obsolete, compared to only 13.1% in 2017.
2020 NTT Network Insights Report
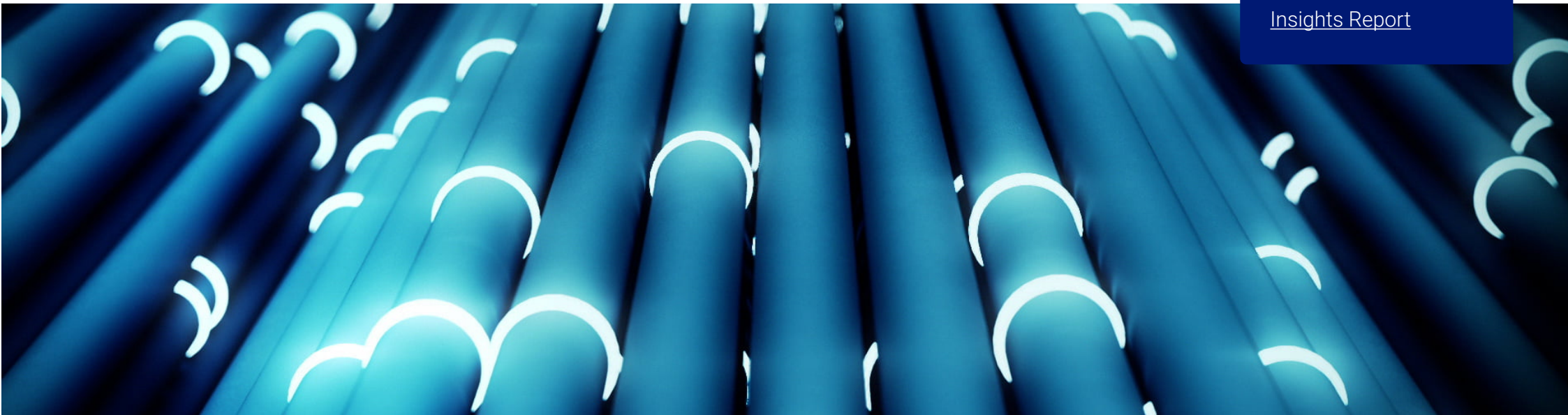
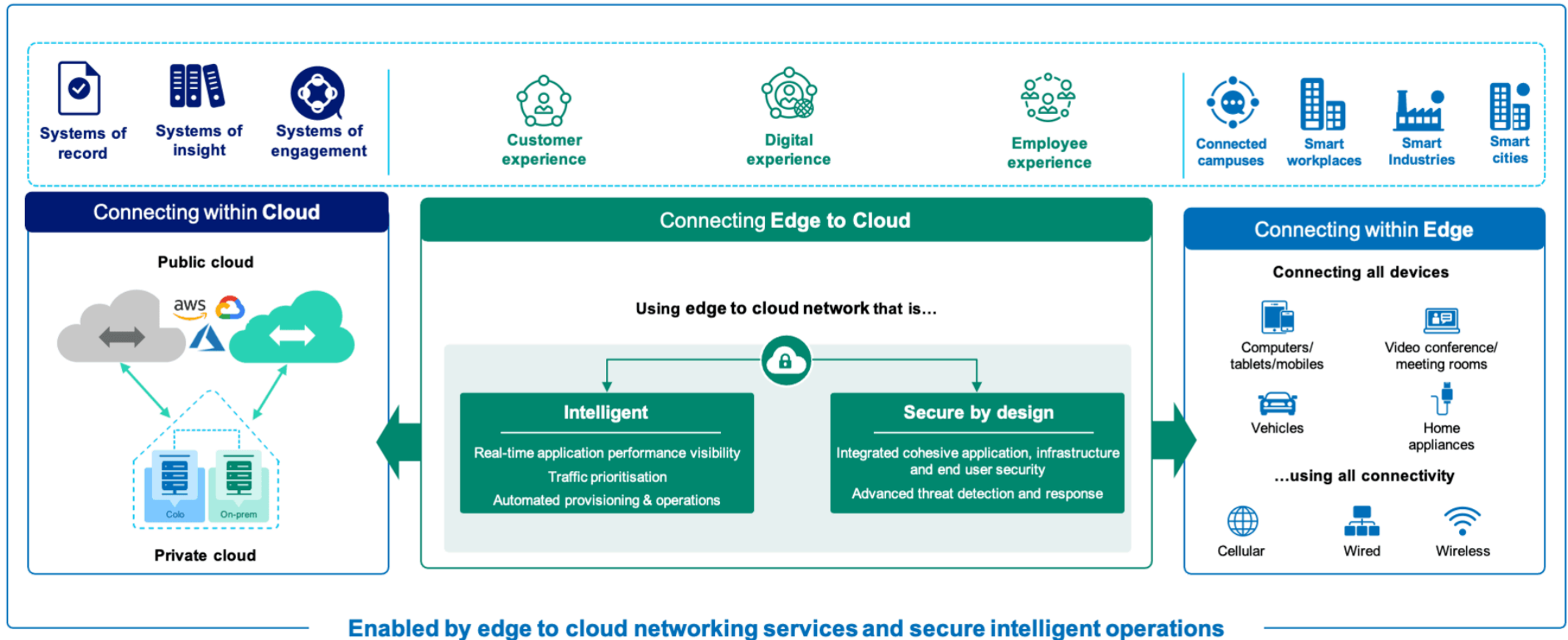# Four essential network modernization considerations

- **Connecting within cloud**
- **Connecting edge to cloud**
- **Connecting within edge**
- **Connecting network operations**

Organizations embracing network modernization are using it as an asset to improve communications and enhance employee experience; be that working in an office, branch or remotely. It also boosts customer experience, as well as drives the ability to move to the cloud and increase performance and availability of applications.

A modern network also enables new business models, such as IoT, optimizes existing operating models around smart buildings or smart manufacturing for example.
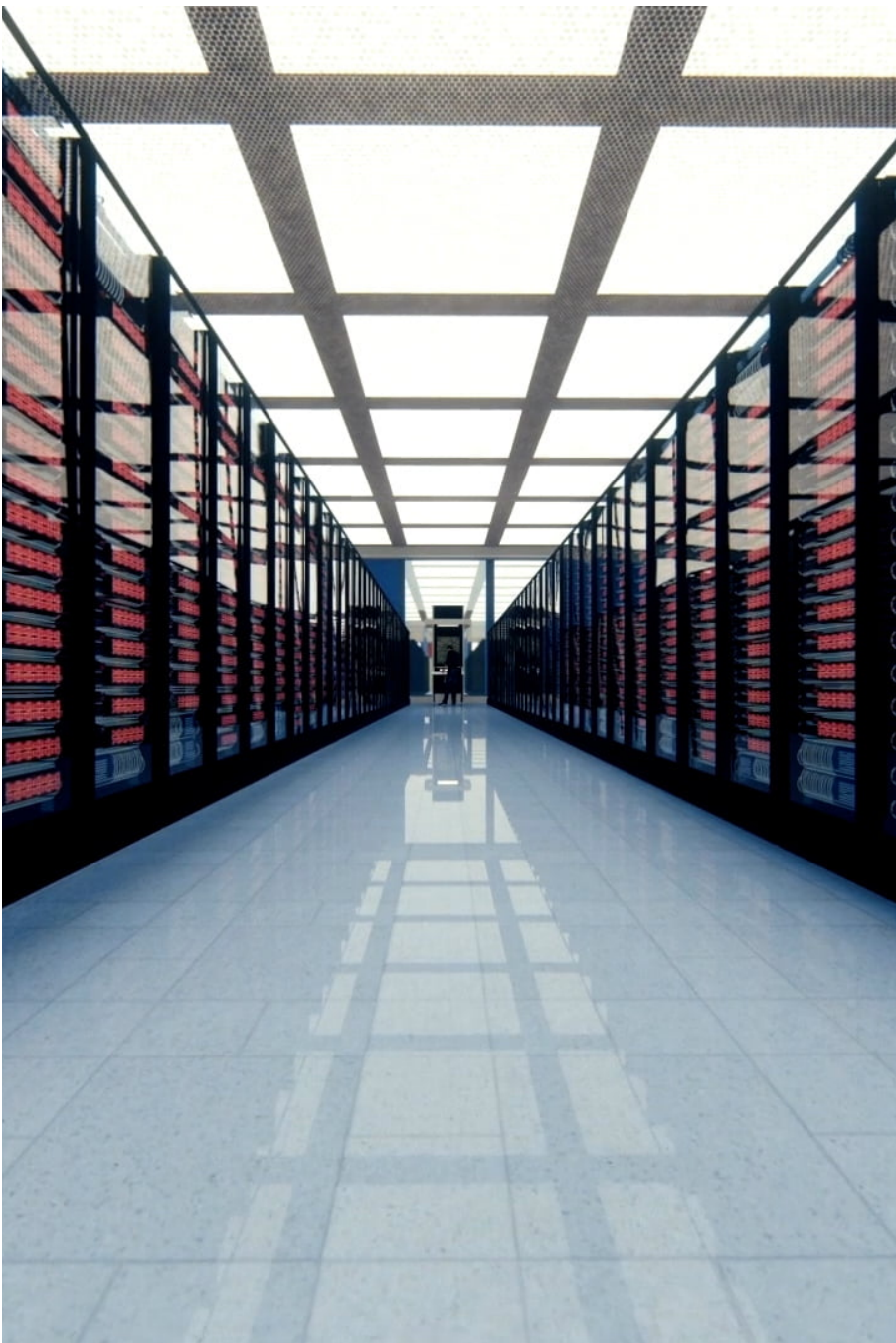
The fabric of your digital organization

Systems of record · Systems of insight · Systems of engagement

Customer experience · Digital experience · Employee experience

Connected campuses · Smart workplaces · Smart Industries · Smart cities

Connecting within Cloud

Public cloud

aws

Colo · On-prem

Private cloud

Connecting Edge to Cloud

Using edge to cloud network that is...

Intelligent
Real-time application performance visibility
Traffic prioritisation
Automated provisioning & operations

Secure by design
Integrated cohesive application, infrastructure and end user security
Advanced threat detection and response

Connecting within Edge

Connecting all devices

Computers/tablets/mobiles · Video conference/meeting rooms

Vehicles · Home appliances

...using all connectivity

Cellular · Wired · Wireless

Enabled by edge to cloud networking services and secure intelligent operations

Connecting within cloud

As digital transformation accelerates, applications and the data they create are the greatest contributors to organizational value and sustained growth. And while cloud has emerged as one of the biggest enablers, it's also extremely challenging to connect to and operate as part of a cohesive IT infrastructure. The myriad of public, private and on-premises platforms hosting internal and external applications, as well as huge volumes of data causes many headaches.

The same can also be said for the infrastructure that supports applications, which enables them to run successfully and to be consumed by users wherever they are. A poorly architected and managed network will lead to failure, irrespective of how good the application or cloud platform is. To be successful, the right thought processes around cloud are required. It isn't simply an execution venue for your applications; it's an operating model. Network technology, management techniques and financial models have evolved dramatically since the advent of cloud. And what worked pre-cloud in the era of non-programmable infrastructure, isn't going to cut it in today's cloud-based, programmable infrastructure environment made up of software-defined architecture, platform delivered management services and automation.

Network technology, management techniques and financial models have evolved dramatically since the advent of cloud.

Network modernization and optimization is a significant opportunity to improve how your network underpins your entire environment and enables your business outcomes. Software-defined approaches and virtual networking, automation and the inclusion of networking in DevOps operational models; together with capex, opex, subscription or perpetual licensing and as-a-service models, have changed the networking landscape forever.

Managing network infrastructure top workload of in-house IT teams
2021 Global Managed Services Report

The myriad of public, private and on-premises platforms hosting internal and external applications, as well as huge volumes of data causes many headaches.

Basildon Borough Council

A critical first step on Basildon Borough Council's transformation program was improving their existing technology infrastructure. We upgraded their network for enhanced connectivity and linked their data center services to our managed service. By taking care of their IT infrastructure we not only helped reduce cost and improve security, but dramatically enhance the end-user experience for their 1,000 employees.

The Council now has the enabling digital infrastructure that will allow them to migrate critical applications to the cloud, innovate faster and launch new, smart citizen services. This robust infrastructure enables Basildon to manage their resources more effectively, be more responsive to citizen needs and develop future world-class services to its community.

NTT

Connecting edge to cloud

As your organization increasingly shifts towards a software-defined environment in a bid to become more intelligent, agile and secure – your network must follow.

Yet, as more applications, users and devices utilize cloud and connect to your network, the less traditional WAN infrastructure is able to cope. It is under intense stress and unlikely to handle the volume of traffic generated by cloud services or the performance needed by real-time applications. In today's modern, software-driven business environment, agility, scalability and better user experiences are non-negotiable.

A network under pressure can lead to a combination of rising costs, poor visibility and inadequate performance. Moreover, as traffic patterns go directly to the internet or cloud, rather than through the traditional data center, outdated components and software within mature WAN infrastructure provides an easy opportunity for online attackers to breach networks.

Implementing a software-defined network for example can support your new world of work by virtualizing connections between systems and networks, replacing physical connections with software. It's agile enough to underpin your organization's cloud-first approach to applications, as well as the varying data sovereignty, application performance requirements and diverse traffic types you require.

A properly implemented SD-WAN applies software-defined techniques across your entire global WAN network infrastructure to create a flexible secure overlay network. Business agility is enabled through central control and orchestration of network policies that can be optimized for different applications as necessary. Beyond this, the network itself can optimize traffic dynamically by constantly monitoring its state through real-time visibility.

But there's much more to modern networks than simply moving to software-defined infrastructures; the reality is that you're likely managing multiple networks, MPLS, Internet and cellular. Thus moving to a software-defined environment isn't simply about flicking a switch and expecting business outcomes to simply materialize. An entire re-architecture needs to take place, as well as understanding how to manage your new environment; particularly the skills, resources, process and tools needed to support it.

60% of organizations are investing in software-defined networks to address business needs.
2021 Hybrid Cloud Report

Additionally, consistent branch networking management is essential. When all things are considered, your WAN by extension will likely have hundreds, potentially thousands of branch networks. This can be hugely costly to operate. However, if you're able to consistently manage them from a central platform, you're in line to make not only significant cost savings, but simplify branch IT and deliver far more efficiencies across all networks.

As part of branch network management, the rise of distributed working has also led to the creation of what we consider microbranches, forcing even greater workloads onto home wireless networks. This means you have to play an even greater role in providing enterprise-grade support to your people, ensuring data is secure as well as considering the deployment of artificial intelligence for IT operations (AIOps) to ensure better visibility and subsequent support.

As you face pressure to do more with less, utilizing an intelligent and secure network creates a robust and above all, resilient platform to ensure your IT budgets are spent more effectively, while affording you the agility and efficiency your organization craves.

Alcatel-Lucent Enterprise (ALE)

Operating a global enterprise in 50 countries required a level of reliability a traditional MPLS network couldn't provide. ALE needed a more cost-effective way to connect their global locations, and customers. As a customer-centric business, ALE constantly seeks to improve customer service. They saw an opportunity to refresh their network, creating a future roadmap to cloud. As implementing cloud-based solutions is part of their long-term business strategy, leveraging SD-WAN, and moving away from MPLS was vital. The next-generation, cloud-ready SD-WAN network delivers optimal bandwidth for ALE, giving the best possible service to customers. Branches experience increased uptime, and business-critical apps run smoothly – allowing employees to deliver better customer service.
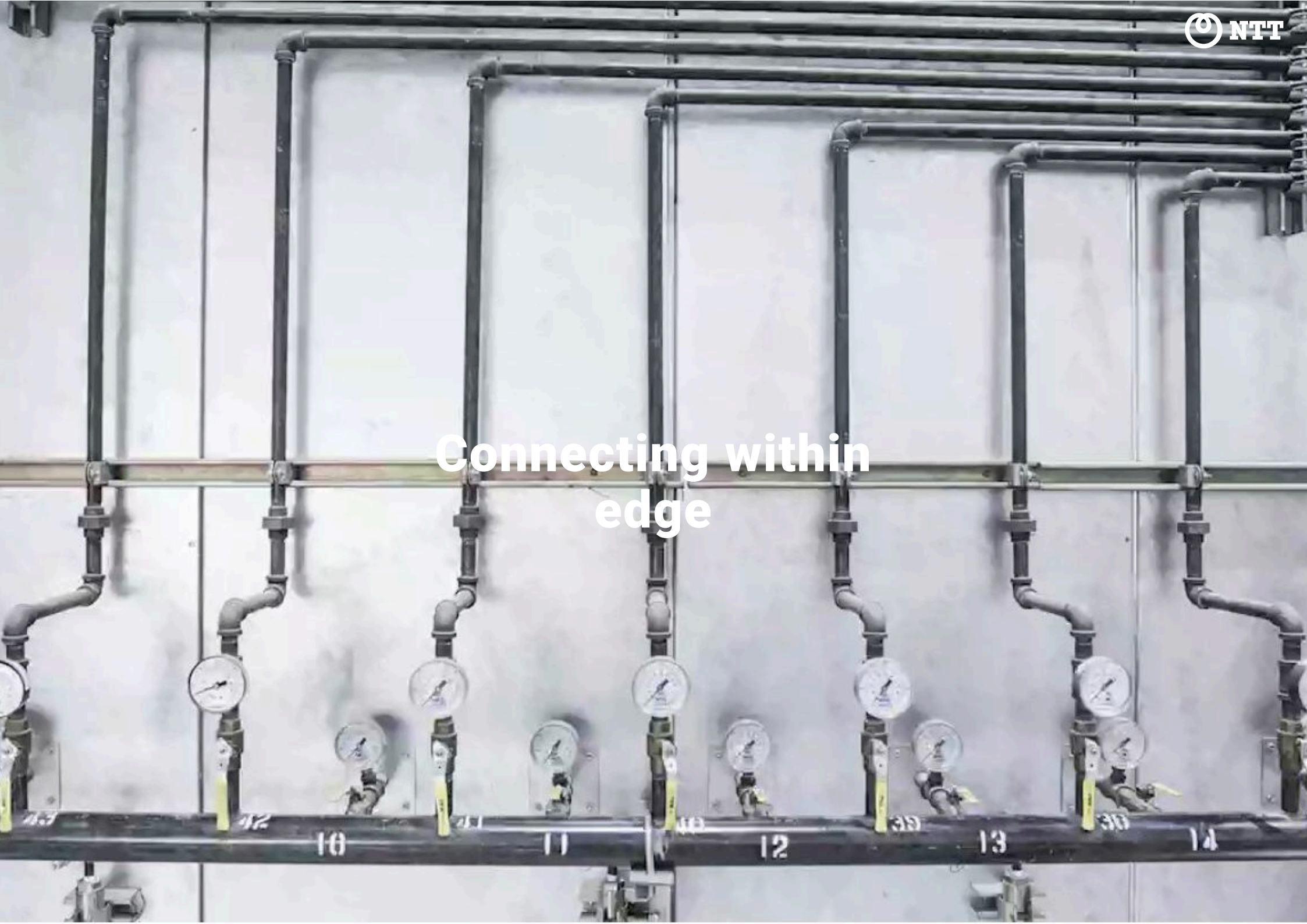
The workplace and the way in which we work has undergone monumental shifts over the past year. This in turn has created a unique set of operational challenges. Hybrid environments and network operations across multiple and often disparate systems have become ever more complex, costly and time consuming to manage and operate.

This has pushed the importance of the network to the forefront. It is the fabric enabling modern communications and collaboration that engender greater employee efficiency and productivity. It also connects people in your office or factory environments to the raft of business services and applications your organization requires while delivering consistent user experiences.

Post the outbreak of the global pandemic, the network now needs to be more tightly integrated into your workplace and building management systems to aid both operational and innovation outcomes. As your people split their time between working remotely and safely returning to an office environment, location-based services can prove vital in monitoring and maintaining health and safety. For example, it can help them find their way in an appropriate manner through an office environment to an open office as well as keep track of the number of people in the office at any one time.

'
As your people split their time between working remotely and safely returning to an office environment, location-based services can prove vital in monitoring and maintaining health and safety. '

Cloud projects underpin deployments of top focus technologies including the key investment areas of Internet of Things, cybersecurity, AI and ML, but almost half (49.3%) are prioritizing network resilience and performance.
2021 Hybrid Cloud Report

This also helps your business meet any regulatory obligations or pandemic protocols during this time.

As a platform for innovation, the continued explosion of data and devices, coupled with mobility, immersive collaboration, video, IoT and big data trends has placed greater pressure on networks and is why we're seeing more and more organizations rearchitecting their campus and edge networks. This provides an opportunity to consider new technologies and techniques like automation, assurance and 5G, and how they could deliver a more effective network platform.

The use of cellular technologies is well known and growing rapidly for IoT solutions but there are some use cases for broader use of cellular, and in particular, Private 5G. For example in manufacturing, 5G could provide better coverage in locations where heavy machinery may interfere with Wi-Fi radio frequency signals, or large-scale sites such as airports and open cast mines where consistent coverage is needed. And while there are cost, performance and management factors to consider, more and more we're seeing both Wi-Fi and 5G work together to provide connectivity for their respective use cases but working together seamlessly. Ultimately, it's about ensuring consistent management of these technologies across your network for the desired business outcome.
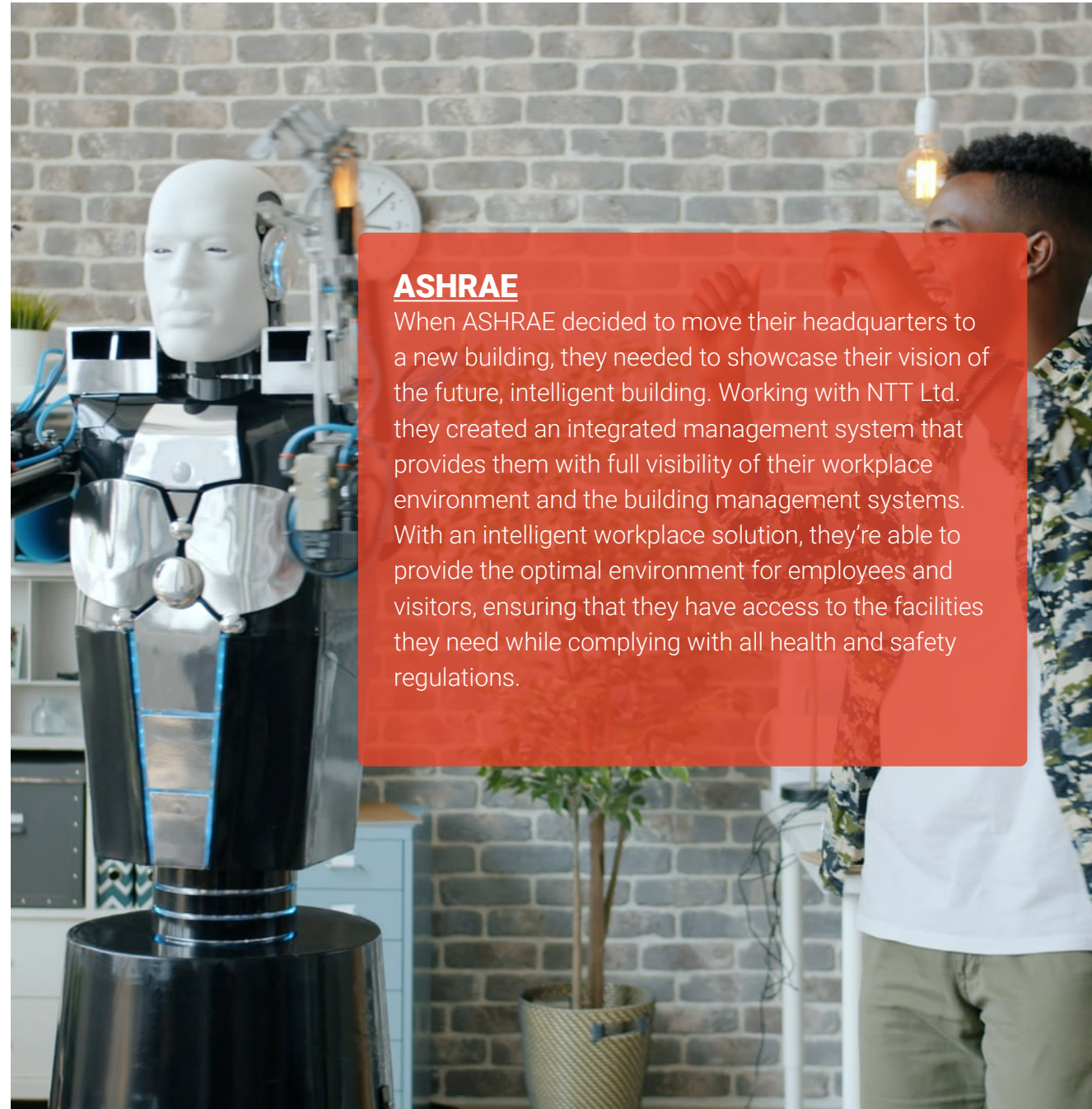
ASHRAE

When ASHRAE decided to move their headquarters to a new building, they needed to showcase their vision of the future, intelligent building. Working with NTT Ltd. they created an integrated management system that provides them with full visibility of their workplace environment and the building management systems. With an intelligent workplace solution, they're able to provide the optimal environment for employees and visitors, ensuring that they have access to the facilities they need while complying with all health and safety regulations.
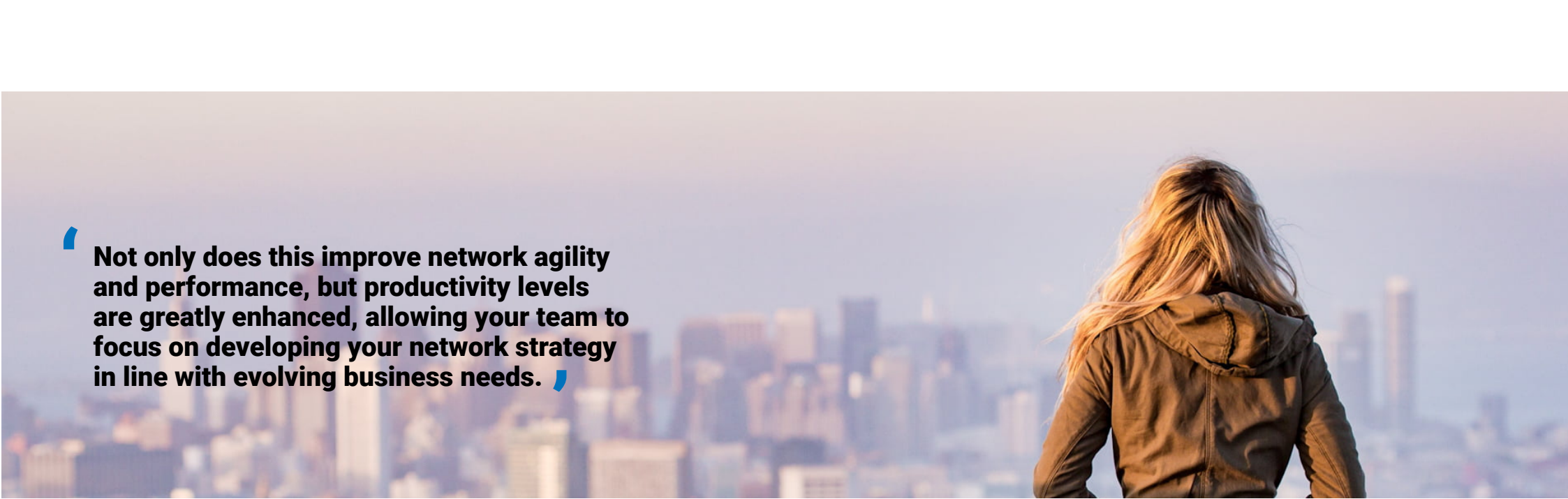
Connecting network operations

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Consistent, efficient and automated network operations is fundamental in helping your organization achieve its objectives, and is particularly difficult to achieve given the rapid pace of change in technology, processes, tools and skills needed for success.

Gaining greater visibility, understanding performance management and gaining enhanced control can be done through automated and AIOps enabled platform-based managed services. And when coupled with software-defined architecture, helps you manage and improve your operational environment across a diverse hybrid landscape more efficiently.

An increasingly important part of your management stack as your organization moves from hardware to software-based networks, is an ability to manage software licenses, entitlements, adoption and consumption. Software procurement models offer very good value if managed correctly and consumption can be measured as part of the overall approach. You can leverage platform-based services to enable rapid change, in conjunction with your internal governance processes, rather than having to decide between the two.

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> **Not only does this improve network agility and performance, but productivity levels are greatly enhanced, allowing your team to focus on developing your network strategy in line with evolving business needs.**

Automation, AIOps and network analytics are increasingly important in not only being able to help you perform repetitive processes flawlessly, but also help make rapid decisions around the operational aspects of your network, incidents or data produced and captured by the network. For example in the instance of managing your SD-WAN, AIOps can enable your team to automatically address 95% of issues before they impact network health, and network analytics can rapidly pinpoint issues and visually recreate trouble scenarios.

And as more challenges are solved, AIOps will continue to learn, evolve and improve at solving these problems, meaning network issues will become easier for your IT team to resolve or ideally, become self-healing. Not only does this improve network agility and performance, but productivity levels are greatly enhanced, allowing your team to focus on developing your network strategy in line with evolving business needs.

Enable your digital future

NTT

We believe networking services leadership is delivered through innovation and unique service capabilities. To help your organization enable a digital future, we've outlined four recommendations below for your network modernization journey. **Learn more about the fabric of your digital organization.**

LEARN MORE ▬

1.

Review ability of your network to support business objectives:

The network is an asset that has become a critical success factor for the vast majority of organizations. The accelerating pace of modern business combined with the rapid pace of innovation in networks mean that the majority of organizations networks are outdated and will not take them into the digital future.

2.

Agility with security and governance:

With a secure by design approach, you can enable agility while maintaining security posture in the network across cloud, the WAN and into the edge. This also ensures you're in a better position to meet compliance and governance requirements, and with the right processes, enabling stronger disaster recovery practices and faster resolution times.

3.

Platform-based services approach:

Consider consuming platform-based operational services with automation, AIOps capabilities and deep predictive analytics. Using a service provider platform significantly accelerates an organizations ability to use these capabilities and benefit from the service providers scale and ongoing investments in features and enhancements.

4.

End-to-end software lifecycle services:

Realize business value and derive economic value by fully leveraging entitlements and capabilities of your network software that underpins transformation. The true value of moving to an agile software-defined network can be undermined if license management isn't taken seriously and where mismanagement can easily undo any efficiencies and operational benefits promised.

INSIGHTS
DRIVEN BY DATA

Thank you for reading

The future of the network

Find out more about the fabric of your digital organization at hello.global.ntt

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