Voices of Change

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The center of IT gravity has shifted to the Cloud Continuum. Have enterprise networks been left behind?

Enterprise networks are being pushed harder than ever. As organizations expand their use of new digital technologies, cloud services and capabilities like edge computing and the Internet of Things (IoT), networks are being asked to perform in ways for which they were simply never designed.

Just consider the number of wireless laptops and mobile devices in a modern enterprise, all continuously accessing cloud services like Microsoft's Office 365 and Salesforce.com or applications on AWS, Azure, Google Cloud Platform and similar public cloud vendors. Now, add in a vast and growing array of sensors from connected machinery and edge devices and the corresponding data they produce. Plus, of course, a new and much larger contingent of remote workers accessing the network from home.

In fact, an entire continuum of cloud solutions now exists across the organization, spanning public and private clouds, applications, data, edge devices, and IoT connectivity. Combined with the need for flexible "anywhere, everywhere" access, this creates a much larger and vastly more complex enterprise IT footprint and fundamentally changes the flow of data in, out and across the organization.

While enterprise IT has generally moved with the times, many enterprise networks simply haven't kept up with this pace of change. In fact, many haven't changed all that much in the last two decades. They were built for a world in which the static desktop PC was the interface and the corporate data center was the center of an organization's IT universe.

As the world changed and the center of gravity shifted to the cloud, many networks failed to evolve. Those that didn't began to fall behind, with overstretched networking teams having to constantly battle outages in their aging infrastructure while patching in new cloud and edge services as best as possible. This organic "bolt on" approach worked for a while. But it meant networking teams never had the opportunity to undertake the fundamental redesign that was sorely needed.

Networks in perpetual catchup risk throttling enterprise innovation

What happens when the network falls ever further behind the enterprise innovation curve? It becomes an ever-greater bottleneck on the whole organization. Consider the fact that, according to Moore's Law, the price performance of compute power and storage doubles every 18 to 24 months. Then consider that networking innovation cycles can be as far apart as a decade (think, for example, of the 10- to 12-year wait between 4G and 5G).

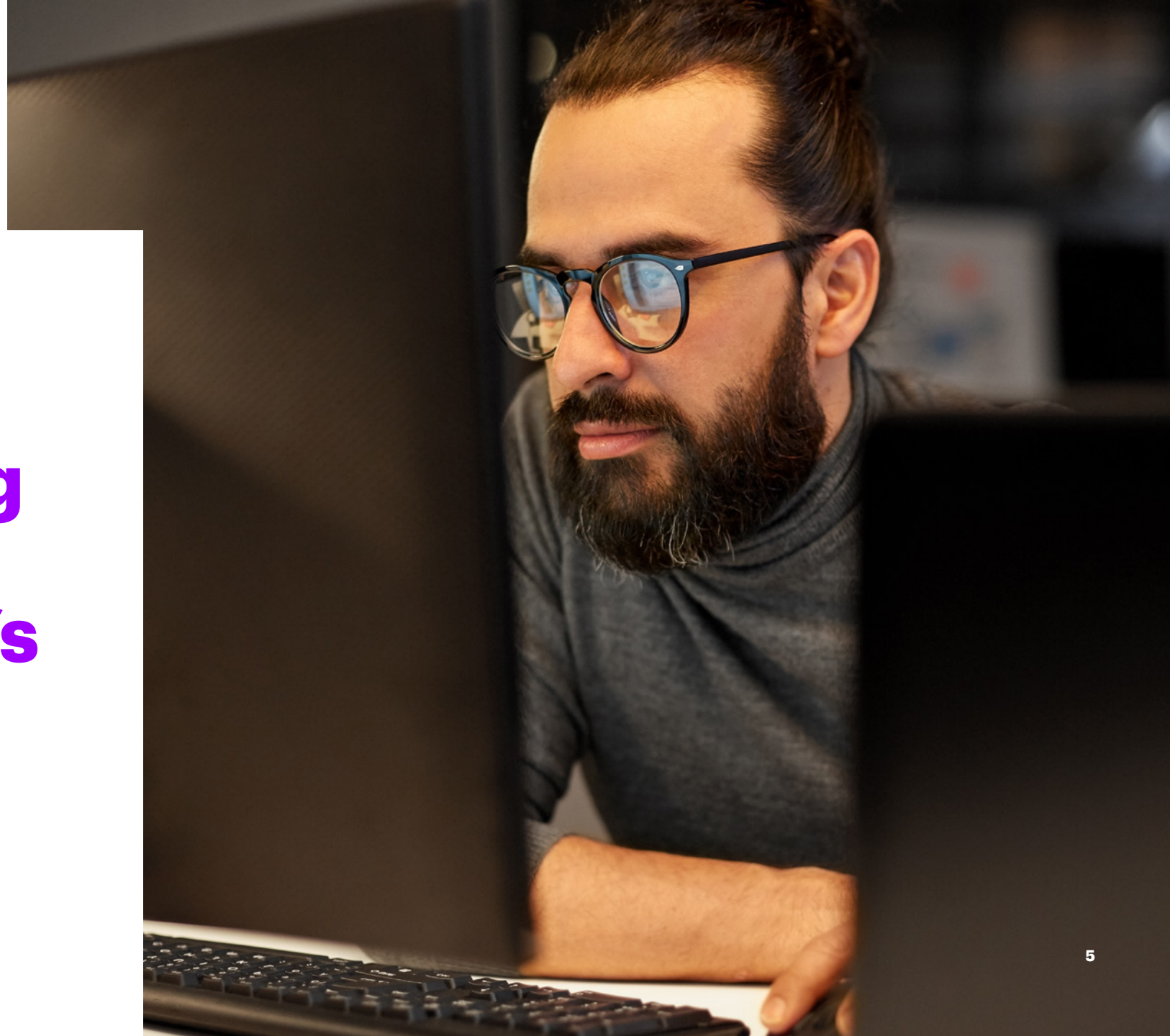
Or what about the extraordinary ease with which modern enterprise IT can tap into new cloud services to support innovation? Contrast that with the fact that it might then take a networking team six to nine months to adapt the network to support those services. Or that the legacy network architecture means all connectivity will still be routed through the corporate data center halfway across the country before it goes out to the cloud.

The risk of throttling the whole organization's ability to innovate is obvious. **But having your network in "perpetual catchup" mode can also lead to security holes and spiraling costs.**

In large organizations, for example, over half of the network budget can be spent on bandwidth. And with the incessant demand for new cloud services, those bandwidth needs can grow 30 percent each year—with a similar impact on cost. In fact, growing costs can be a strong indicator of more fundamental problems. Any organization that finds itself continuously chasing soaring bandwidth costs should be looking for underlying design issues with its network.

Why have networks fallen behind? The truth is the networking parts of a cloud journey have too often been treated as an afterthought or as "just another" infrastructure fix. That inevitably leads to a reactive, patchwork approach, where issues are addressed only when something breaks, or costs start to escalate. Taken to extremes, organizations can get into a spiral of technology debt where their network teams are spending all their time and budget maintaining and fixing legacy technology rather than reimagining it for the business's future needs.

An overhaul of networking is overdue. Here's why it's a priority.



Today's networks need to be able to meet a wide and rapidly changing set of business requirements and provide employees with seamless connectivity to data, applications, and platforms from anywhere and everywhere. This includes the ability to handle:

- **Support for the rapid innovation cycles and organizational agility enabled by ever-increasing cloud adoption**
- **Application-to-application connectivity across multiple cloud services and back into the enterprise and partner company data centers**
- **Increasingly distributed, complex, and dynamic applications that make use of modernized microservices, containers, Kubernetes orchestration, and serverless architectures**
- **Vastly higher traffic from machine-to machine-communications, including potentially huge volumes from edge devices and IoT sensors**
- **The explosion of enterprise data and the growing integration of advanced analytics (including machine learning) into day-to-day working life**
- **Secure connectivity with the cloud, including protection for outbound traffic as well as inbound**
- **Rapid and radical changes in the way people work in the post-pandemic economy—most notably a permanent increase in remote working.**

The overarching objective is to rearchitect the network for a modern cloud environment. That means building an any-to-any device-to-cloud network that leverages an advanced automation layer and is linked to a broader infrastructure-as-code approach. This is essential in getting the network from a position of technology debt to a position of technology wealth. In the remainder of this paper, we provide a series of practical recommendations for making that happen.

Five steps to a modern network

01

Build a secure network foundation for cloud services

The first step is to ensure that building a secure and integrated network architecture is a core part of the broader cloud strategy. That architecture needs to be highly programmatic, with rigorous security, to cover traffic between devices and workloads, between workloads themselves, and between clouds. Network servers (IPAM, DNS, etc.) that once lived in the data center should be migrated to the cloud and become an integrated capability that provides the fundamental network services for the enterprise. Another consideration in this equation is the emergence of 5G which offers the possibility of "removing the wires" of private networks and unlocking enterprise-wide mobility of devices.

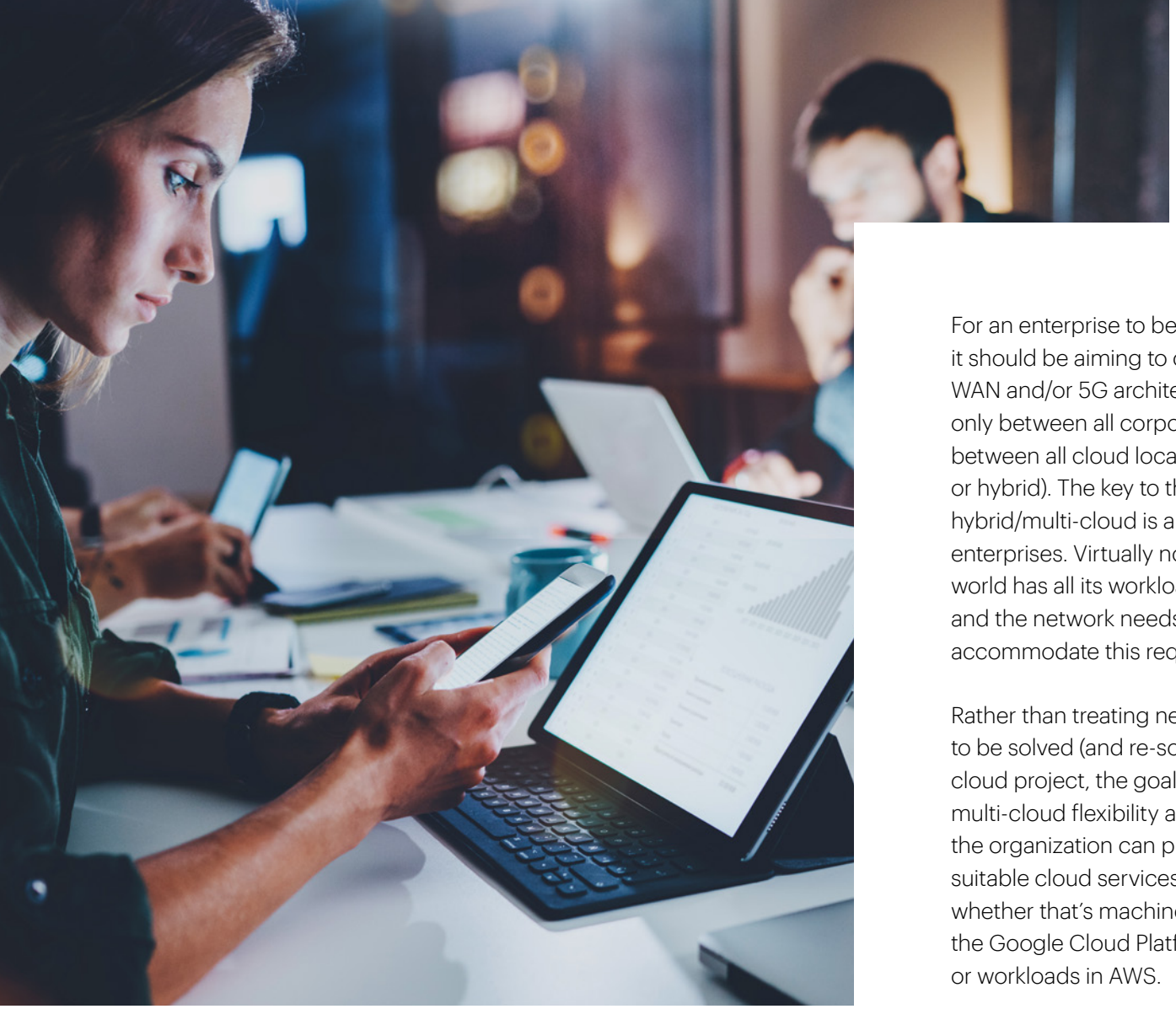
> By creating a configurable architecture, the network is enabled to change as new cloud native projects are added.

Delivering global cloud architecture for a large manufacturer

Accenture helped the company build a target state cloud architecture driven by our Secure Cloud Foundation framework. The secure, multi-account AWS environment was constructed with Accenture and AWS best practices built into the architecture and code. The Cloud Foundation solution automates the set-up of an environment rooted in an initial security baseline, to support running secure and scalable workloads in the cloud. **The Secure Cloud Foundation framework proved to be the catalyst in delivering a network able to keep pace with new cloud services.**

02

Set up the software-defined network for a hybrid/multi-cloud environment



For an enterprise to be truly cloud enabled, it should be aiming to create an integrated WAN and/or 5G architecture that operates not only between all corporate locations, but also between all cloud locations (public, private, or hybrid). The key to this is to recognize that hybrid/multi-cloud is a reality for modern enterprises. Virtually no organization in the world has all its workloads in a single cloud, and the network needs to be designed to accommodate this requirement.

Rather than treating networking as a problem to be solved (and re-solved) with each new cloud project, the goal is to provide hybrid/multi-cloud flexibility across the network so the organization can pick and choose the most suitable cloud services for its unique needs — whether that's machine learning services on the Google Cloud Platform, a data lake in Azure, or workloads in AWS.

To simplify this process, enterprises should consider using a software layer product to manage the WAN and 5G connectivity across multiple clouds.

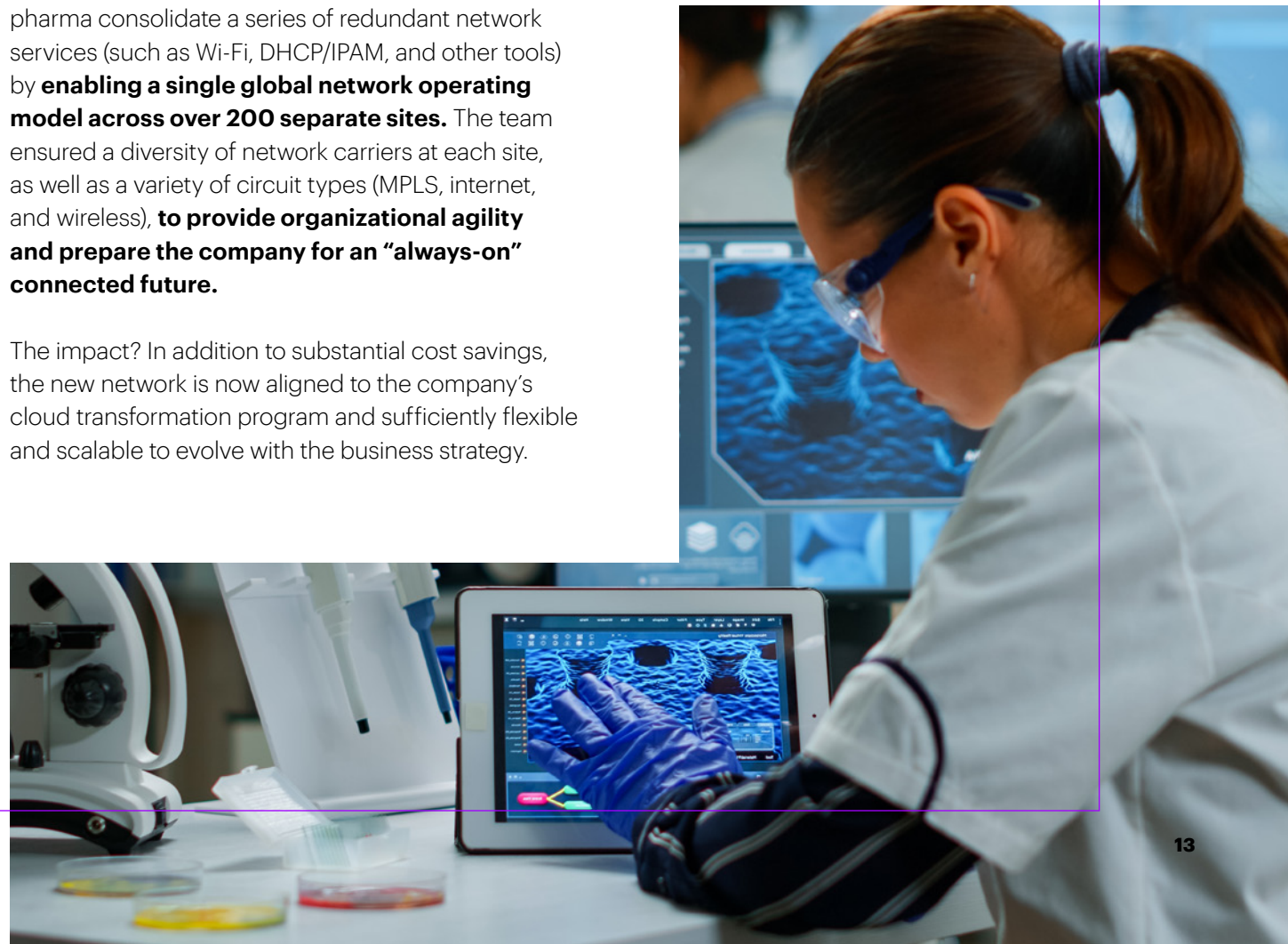
Helping a large pharma build a single unified network with optimized cloud access

One major pharmaceutical company decided to embark on a significant network integration program. Working with Accenture, it built a single unified network with optimized cloud access, seamless user experience, and a centralized core of network services.

To achieve this, Accenture deployed software-defined networking in a wide area network (SD-WAN) to create a unified wide area network (WAN), thereby moving the existing corporate location, plus a large number of recently acquired locations, onto a single integrated global network service.

Managing a highly complex program involving numerous telco and network circuit (bandwidth) providers, Accenture also helped the pharma consolidate a series of redundant network services (such as Wi-Fi, DHCP/IPAM, and other tools) by **enabling a single global network operating model across over 200 separate sites.** The team ensured a diversity of network carriers at each site, as well as a variety of circuit types (MPLS, internet, and wireless), **to provide organizational agility and prepare the company for an "always-on" connected future.**

The impact? In addition to substantial cost savings, the new network is now aligned to the company's cloud transformation program and sufficiently flexible and scalable to evolve with the business strategy.



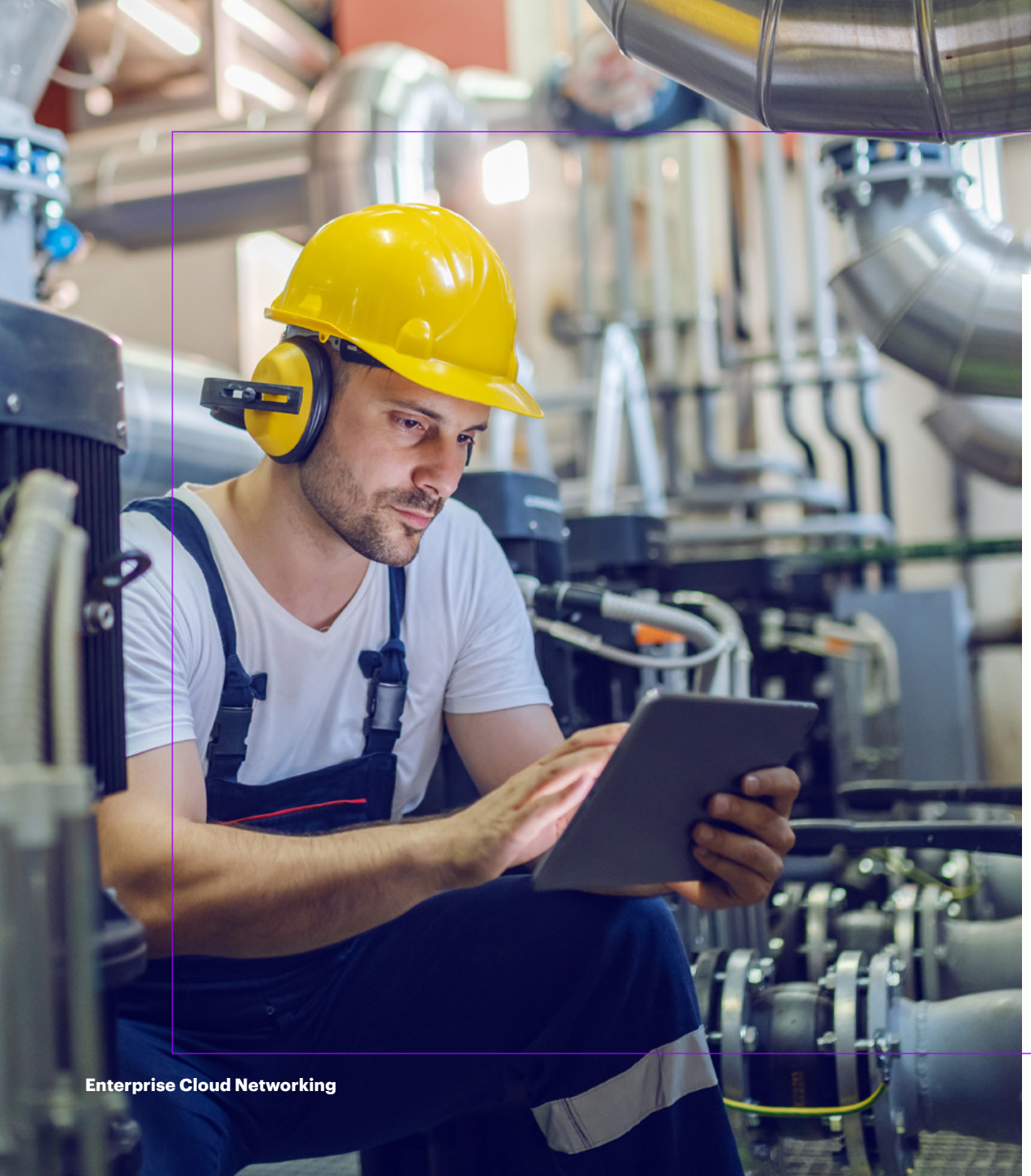
03

Automate as a Rule

Think back to how networks used to be managed. This was characterized by predominantly static environments to which routers and/or switches were added as required and group of engineers that manage the physical hardware. This worked well for the times but does not scale at all in the cloud era. A cloud service might spin up thousands of workloads instantly to handle a sudden burst of activity. Managing a network manually at that speed and on that scale is simply impossible.

> So, having a highly automated programmable network layer is now a key enterprise capability.

That layer should be integrated with cloud workloads and enterprise tools via a set of APIs, so that the monitoring and analysis of workloads and network happen as one unified approach – vastly accelerating the network's ability to flex with the needs of the business.



Delivering operational economies with the use of automation for a global client

At a large oil and gas company, Accenture took over operations of the client's global network. Accenture deployed over 125 pre-built use cases for baseline automation scenarios to quickly reduce operations team activities. Using a variety of standard DevOps tools like Jenkins, python scripts and even leveraging client tools, Accenture was able to quickly customize and integrate these automations into the production environment, **enabling the company to leapfrog capabilities and service yielding more than an 80% incident reduction.**

04

Ensure Resilience by Design

For any enterprise network, the need to send an engineer out to fix network hardware when an outage happens can be a major contributor to technology debt and adversely impact availability metrics. Consequently, it's essential to build enough redundancy into the network to create resilience across the whole system. Ideally, this means that no single outage can ever impact users' abilities to access any services.

Achieving this requires a conceptual shift to a model based on the premise that every component is likely to fail and the network, therefore, needs to be sufficiently resilient to account for such failures. A highly effective way of doing this is with a technique called chaos engineering. Under this model, developed initially by Netflix, a tool (referred to as a "chaos monkey") causes outages at random in the production environment, to test the resiliency of the system.

> By doing so, the enterprise can address weaknesses, strengthen the overall system and have confidence it has the resilience and the redundancy needed to deliver round-the-clock availability.

Delivering Operations simplification for global financial company

At a large insurance company, Accenture developed and implemented automations that were able to provide a self-healing layer around the network, by identifying problems, logging tickets with the service management tool, scheduling fixes within the change management guidelines, implementing fixes, and verifying and closing tickets.
The automations generated outcomes of ~95% auto-ticketing for key network issues, and 35% reduction in time to resolve outages.

05

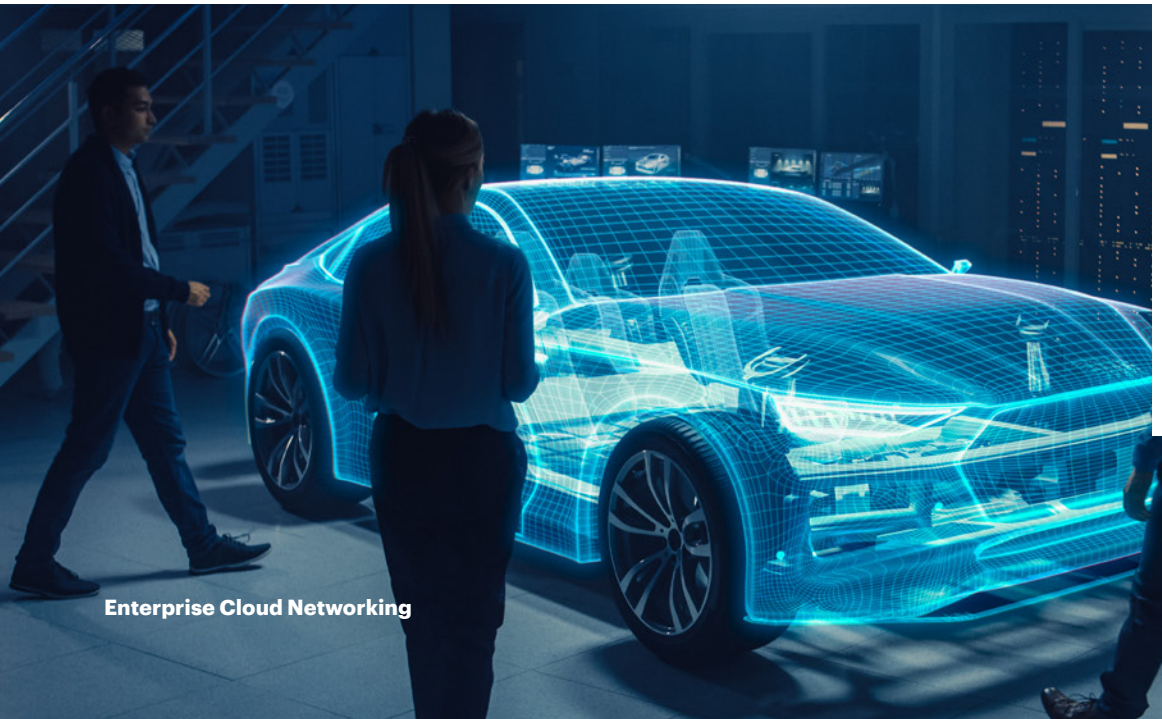
Build your network for new ways of working

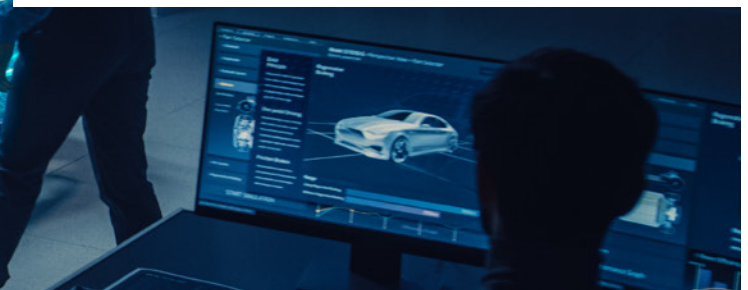
In today's world, the goal is to optimize the network to enable everyone in the enterprise to access cloud services from anywhere and everywhere—but with the right level of security, the right bandwidth, the right performance, and at the right cost.

Secure Access Service Edge (SASE) is an emerging option. By bundling together SD-WAN and security capabilities, delivering them as a service, SASE provides access and security across a device-to-multi-cloud network (including the data center, office locations and other sites, and remote workers). The result is a more secure, more agile end-user footprint that's also simpler to manage.

5G connectivity is also unlocking new high-speed, low latency applications where Edge plus AI can be used to perform processes 10x or 100x better than humans. Human reaction time is 100ms to 200ms, but 5G connectivity can transmit at 20Gbit/sec with a 1ms latency. So now, not only can you have a device control something it's directly connected to, and with the latest 5G "sidelinking" standards, devices can connect back to a number of local devices in a mesh to have AI control of **processes using 100x the information and having reaction times 100x faster than a person doing the same task.**

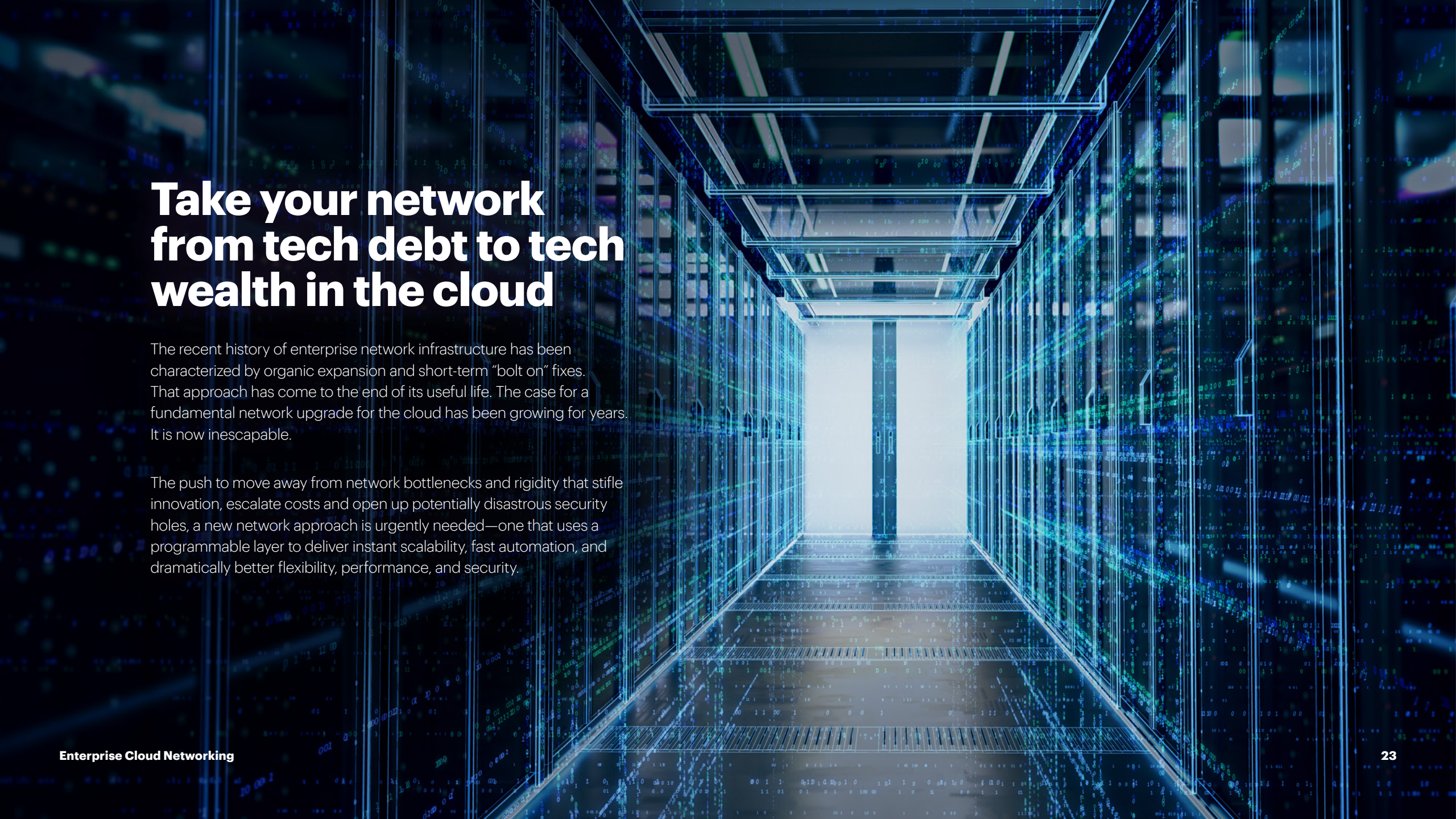
> For example, you can have a device at the edge of a network such as an electronic control unit in a vehicle that can directly control that vehicle in real-time with zero latency.





Building a new global cloud-based environment for chemicals company

Accenture designed and deployed a cloud-based network architecture for a chemicals company with SD-WAN using the Internet as the primary transport. In addition, the architecture integrated security across all layers including SASE – enabling services to be delivered securely for users from offices and remote locations. This was especially critical as the pandemic hit just a couple months into the transformation. **As a result, all users were able to seamlessly transition to remote working due to the integrated SASE architecture.** The new design was a critical factor for services and application availability during the COVID-19 pandemic.



Take your network from tech debt to tech wealth in the cloud

The recent history of enterprise network infrastructure has been characterized by organic expansion and short-term "bolt on" fixes. That approach has come to the end of its useful life. The case for a fundamental network upgrade for the cloud has been growing for years. It is now inescapable.

The push to move away from network bottlenecks and rigidity that stifle innovation, escalate costs and open up potentially disastrous security holes, a new network approach is urgently needed—one that uses a programmable layer to deliver instant scalability, fast automation, and dramatically better flexibility, performance, and security.

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About Accenture

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