Different Roads Lead to Autonomous Networks

Fully autonomous networks are the destination that communications service providers (CSPs) are driving toward. However, the road takes a different route, depending on the region in which a CSP operates. Each part of the world brings its own challenges and realities that will influence how CSPs invest in automation and AI, and which partners they work with along the way.

Nokia aims to help our customers on this journey by powering networks that sense, think, and act, regardless of where they are on the map. Building on TM Forum's Autonomous Network Framework, we deliver AI-driven automation across radio, transport, cloud, and core, with security woven in from the ground up. This year, we're taking the next step with the launch of Nokia's Autonomous Network Fabric to help CSPs better secure, automate, and monetize their networks.

Before we get into those details, let's look at autonomous network progress across the different regions and how we're helping customers bridge the gap between where they are and where they want to be.

Every region's road to autonomy

CSPs are advancing network automation at different speeds because each network environment faces unique roadblocks. In TM Forum's regional analysis of autonomous network adoption (n = 148), Asia-Pacific is charging ahead of the pack. With national policy backing, significant government R&D funding, and massive mobile-first populations, CSPs like China Mobile and NTT DOCOMO are deep into closed-loop automation and AI/ML deployments. 66% of CSPs are taking a measured step-by-step approach, while 34% are pursuing transformative strategies head-on. This dual-speed dynamic reflects the region's diversity, where advanced digital economies coexist with markets still laying down infrastructure.

Nokia is engaged in this region, helping China Mobile reach its autonomous networking goals by saving $7 million in opex. We're also helping Australian CSP, Telstra, tackle the complexity of cross-domain orchestration. With our orchestration center and unified inventory solutions, Telstra can now set up new orchestration domains in under 48 hours, leading to faster time-to-market for new services.

In Europe, ambition meets complexity. This region's multi-vendor ecosystems and strict regulatory frameworks, especially around data privacy and net neutrality, slow progress, but not innovation. According to TM Forum's regional survey data, CSPs like Orange and Deutsche Telekom are pushing forward with cloud-native strategies and sustainability initiatives. We also take our customers' sustainability priorities seriously; our Energy Efficiency solution, which is deployed in only weeks, helps CSPs reduce energy consumption and carbon emissions by up to 30%, without compromising network performance or customer experience. This region also shows the highest rate of incremental strategy: 72% of CSPs are focused on gradual automation, while just 28% are in transformation mode. That caution is understandable in a landscape built on existing infrastructure, and it underscores the importance of multi-vendor orchestration and assurance, areas where Nokia brings strength, most recently with Telenor.

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The Middle East and Africa present a study in contrast. Countries like the UAE and Saudi Arabia are rapidly advancing, leveraging top-down mandates to fast-track 5G and autonomous capabilities. Here, 56% of CSPs are already executing bold automation strategies, while 40% are taking a more gradual route. Meanwhile, in Africa, infrastructure and investment gaps remain, but interest is rising fast. Energy optimization and rural connectivity are key drivers. CSPs are nearly split: 48% are moving ahead with transformative strategies, while 52% are focusing on steady progress. Nokia is engaged with stc in this region to help the CSP strengthen its monetization potential.

In North America, leaders like Verizon and AT&T are betting on closed-loop assurance and AI to bring more value from large, complex networks. Yet, despite the innovation, 89% of CSPs are prioritizing incremental automation, and only 11% report transformative strategies in motion. That slow-and-steady approach likely stems from the scale of operations; this signals an opportunity for frameworks that simplify automation.

In CALA (Caribbean and Latin America), caution is even more pronounced. 100% of CSPs surveyed in this region are focused on gradual automation. While the pace may be slower, the focus is clear: build observability, unify data, and set the foundation for fully autonomous networks in the long-term.

Despite the differences across the globe, there's an undeniable through-line: CSPs in every region recognize that automation is inevitable, and they share the same end goals: Save costs, improve CX, and increase revenues. And they need the flexibility to get there in a way that suits their individually complex environment.

Nokia's Autonomous Network Fabric: Intelligence that Scales

At Nokia, we've boiled a complex concept down to three powerful verbs:

- **Sense** with 360° observability
- **Think** with explainable AI
- **Act** with closed-loop automation driven by business intent

We've earned our position as a thought leader by doing something many shy away from, making the complex reality of autonomous networks easier to understand and trust. Now, we're taking the next step forward.

We're evolving our Cloud and Network Services (CNS) portfolio to include the Autonomous Network Fabric. It's a common intelligence layer that connects and powers our entire application portfolio with secure automation, trusted data, and AI at scale. It's what transforms a fragmented network into a single, smart, adaptive system.

We aim to differentiate in five critical ways:

- **Data-native by design:** Our Autonomous Network Fabric leverages modern data mesh and management architectures that minimize duplication, integrate with existing customer data lakes, and ensure quality, privacy, and trust to scale AI confidently.

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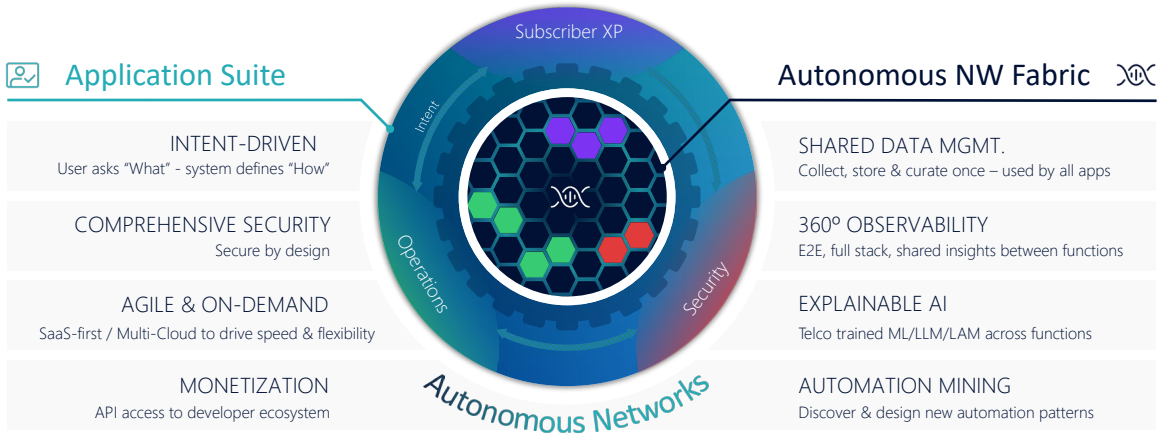
- **Built for every deployment:** With a SaaS-first approach, our Autonomous Network Fabric works seamlessly across hybrid, on-prem, and cloud environments.
- **Unified intent management:** Our single application suite can translate business and operational intents into real action, unlocking the value in areas like customer satisfaction, profitability, churn reduction, sustainability, and threat response.
- **Cybersecurity leadership in telco AI:** Nokia's expertise in telco-grade AI governance and GenAI-enabled cybersecurity solutions ensures that trust is built in, not bolted on.
- **Cross-domain experience:** We're unifying data and user experience across assurance, analytics, and security, delivering something few OSS players in telecom can.

Our Autonomous Network Fabric gives CSPs the tools to scale value, fast. Whether it's shared data management, explainable AI, or automation mining, every capability is built as a reusable building block. This means faster app development, easier customization, and the ability to monetize your investments through new offerings like NaaS and Nokia's Network as Code.

Sense, Think, Act: From roadblocks to breakthroughs

The road to autonomous networks varies significantly across regions, shaped by each market's unique challenges, regulations, and infrastructure realities. We meet CSPs where they're at, providing tailored services and solutions to secure, automate, and monetize networks.



With Nokia's Sense, Think, Act framework and our Autonomous Network Fabric, CSPs around the world can move beyond fragmented operations and start building unified, scalable autonomous networks. From the rapid advancements in Asia-Pacific, to the regulatory complexities in Europe, to the diverse conditions in the Middle East, Africa, North America, and CALA, we will help our customers progress confidently toward fully autonomous networks at a pace and scale they choose.

Visit Nokia's Autonomous Networks web experience to learn more about our Sense, Think, Act framework. Read our stories and take the quiz to test your Autonomous Network knowledge today.

About Nokia

At Nokia, we create technology that helps the world act together. As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

AN case studies

Telstra, Australia

Dynamic, composite service orchestration

<48 hours

Set-up of new orchestration domains or entities

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Significantly reduced cost of maintaining siloed, customized orchestrators

API-first

Leverages intent-based APIs and ODA for simplified integration

Case study: Telstra Australia - dynamic composite service orchestration

Challenge

- Siloed creation and orchestration of the services for different domains and networks
- Lacking the ability to offer aligned, adaptable and cross-domain services
- Complexity in service creation due to many tools and domain-specific GUIs

How Nokia Helps

Autonomous closed-loop dynamic orchestration based on intent-driven Orchestration Center, underpinned by Unified Inventory. Deployed in public cloud and multi-vendor network environment

Single pane of glass for the creation of composite and adaptive services, based on business policies, for mobile, fixed and transport networks

Flexible, open, and adaptive solution supporting use cases such as Adaptive SDWAN, 5G Slicing, and Edge in multi-domain network across fixed and mobile access

The solution is compliant to standards like 3GPP, ETSI, and TM Forum's ODA (Open Digital Architecture) e.g. TMF's APIs

Outcome

- Composite, horizontal solution, covering multi-tenancy and the entire life-cycle of the service
- Adaptive and dynamic orchestration of services based on policy-driven conditions and options
- Ability to offer more use cases while reducing the number of orchestrators in the networks
- Making the life of a service designer easier with a single pane of glass

AN case studies

stc, Saudi Arabia

Improving 5G monetization by enabling tailored services for enterprises and consumers

Through intent-driven autonomous operations, the creation of end-to-end slices at scale will be accelerated from days to minutes and becomes highly reliable and programmable.

"Providing new 5G slicing services and technology openness go hand in hand for stc, so we're pleased that Nokia has these capabilities that will provide our customers with specific network experiences, while giving us fresh automation and operational efficiency benefits."

Anwar Al-Subhi
GM, Cloud Infrastructure, stc, Saudi Arabia

stc selects Nokia Orchestration software to deliver 5G slicing and strengthen monetization efforts | Nokia.com

Challenge

- How to monetize 5G and offer new and tailored services to enterprises and consumers
- Need for automation to allow end-to-end, service lifecycle orchestration for 5G slicing
- How to be able to launch new and differentiating digital services and slices to the market quickly
- Ability to offer new type of digital services such as SDWAN, and IPVPN to the end customers

How Nokia Helps

Orchestration Center provides a single, multi-tenanted platform; orchestrating the design and deployment in multi-vendor environment; and delivering against business-specific SLAs

As a trusted partner, fully aligned with stc's strategy for automation, to enable 5G monetization through slicing orchestration, openness, and flexibility in service creation

Nokia's Orchestration Center software will be used for various market-driven use cases, including slice-based services such as gaming, and supporting complex IP services for the end customers.

The solution is future-proof, and compliant to standards like 3GPP, ETSI, and TM Forum's ODA (Open Digital Architecture) such as TMF's APIs.

Outcome

- Strengthening stc's position as a leading service provider and digital partner in the region
- 5G monetization of versatile and tailored slice-based services for B2B and B2C customers
- Deploys end-to-end 5G slicing automation across multi-vendor radio, transport, and core
- Accelerates new service launches by automating slice deployments from days to minutes
- Allows the end-to-end orchestration for new IP services such as IP-VPN and SDWAN