NOKIA | K2

Powering Brazil's future

Nokia partners with K2 Telecom to boost network security and ignite new revenue streams



Meet K2 Telecom, a premier Brazilian ISP with 20-plus years of connectivity expertise

- **Connectivity leader in Southeast Brazil:** For more than two decades, K2 Telecom has been a leading provider of top-tier connectivity solutions in Brazil's Southeast Region.
- **B2B and wholesale focus:** K2 Telecom caters to a wide range of sectors, including businesses and internet service providers (ISPs), with a network that includes more than 20,000 km of optical fiber. This infrastructure brings robust and reliable connectivity service to Brazil's four largest states—Rio de Janeiro, São Paulo, Minas Gerais and Espírito Santo.
- **Strategic presence in key data centers and IXs:** K2 Telecom's network is integrated into major data centers and internet exchange points (IXPs) throughout the Southeast. It offers seamless, uninterrupted access to essential internet content and services, underscoring the company's commitment to excellence in connectivity.
- **Cutting-edge security innovation:** K2 Telecom combines advanced Nokia IP routing with Nokia Deepfield's AI-driven big data security analytics to deliver state-of-the-art DDoS protection and security-enhanced services. With this modern approach, the company ensures that customer operations continue uninterrupted even during DDoS attacks, maintaining low latency and continuous access to vital internet content.



K2 Telecom:
A commitment to continuous innovation

K2 Telecom began its operations in the interior of the State of Rio de Janeiro, initially serving the residential and retail markets.

Understanding the importance of building a robust network infrastructure, the company focused on building physical networks and rolling out fiber. This allowed it to expand its reach and provide connectivity to areas beyond major urban centers.

K2 Telecom used this expanded reach to become a pioneer in democratizing IP transit services. It provided downstream connectivity to hundreds of ISPs and helped companies located outside major cities to compete and address bigger markets.

Today, K2 Telecom has a presence throughout Southeast Brazil and offers a wide range of highly customizable enterprise connectivity products, including:

- **Dedicated IP link:** Guaranteed upstream/downstream bandwidth and valid IP addressing for small- and medium-sized businesses.
- **Clear channel pipe:** Connectivity for enterprises that have multiple sites, including point to point (P2P) and point to multipoint (PMP).
- **IP transit link:** A Border Gateway Protocol (BGP) peering solution for connectivity with other ISPs and communications service providers (CSPs).
- **Last-mile connection:** Provision of last-mile connectivity for operators in approximately 150 cities.
- **DWDM channels:** Optical transport of 100 GHz-wide channels that support speeds from 1 Gbps to 400 Gbps.
- **Dark fiber:** Infrastructure sharing with dark fiber segments for exclusive network interconnection.
- **Colocation and data center:** Support for 200 points of presence (PoPs) in Southeast Brazil, offering physical space, racks, cooling and redundant power with high availability and 24x7 security.
- **Anti-DDoS services:** Advanced DDoS protection based on the Nokia Deepfield AI/ML-driven big data security technology and the latest generation of Nokia FP-based routers. These capabilities detect and mitigate DDoS attacks in seconds, ensuring unparalleled protection for infrastructure, services and customers.

K2 Telecom is committed to continuously innovating its network while providing services and solutions that deliver superior quality and performance to customers. The company aims to meet customers' specific needs while optimizing the cost and affordability of premium connectivity and security services.

Network growth and the DDoS security challenge

Over the past several years, K2 Telecom has experienced **exponential growth** in bandwidth consumption from its customers. It has also added many new customers. To manage this growth, the company has made significant investments in DWDM transmission systems and edge IP routers to deliver services that can meet the performance and quality demands of the enterprise segment.

Focused on improving regional enterprise connectivity, K2 Telecom has become an important player for downstream ISPs and carriers, as well as companies with complex operations in critical sectors such as oil and gas.

With a growing customer base and a much **higher volume of network traffic** to manage, K2 Telecom recognized that it needed to **improve network security and protect network traffic and customers** against DDoS attacks. Maintaining uninterrupted operations and delivering reliable services became its main concerns.

The challenge was to keep the new generation of DDoS attacks at bay. This proved to be an impossible task using technologies and approaches that were built decades ago. DDoS attacks now come from the outside (from the malicious actors on the internet, over peering and transit links) and the inside (from customers or infected or compromised IoT devices). To combat DDoS attacks varying in technique, duration, potency and sophistication, K2 Telecom needed a new anti-DDoS solution that could provide:

- Strong protection against different types of DDoS attacks, from volumetric to application-layer attacks
- Fast and accurate DDoS detection and agile and precise mitigation
- Scalable protection to keep pace with increasing traffic levels and a growing customer base
- Automated DDoS protection without adding layers of complexity
- Ability to deliver managed security services to and monetize the security opportunity.



Building a solid IP networking foundation for the future

To prepare its IP network for years of super-scalable, cost-efficient growth, K2 Telecom chose the Nokia 7750 Service Router family, which combines high performance, scalability and reliability with low latency. The 7750 SR platforms also deliver high efficiency with superior port density, low energy consumption and scalability of up to 800 Gbps per port.

The advanced IP routing technology in the multi-services 7750 SR platforms is ideal for supporting converged edge operations. It provided K2 Telecom with a foundation for providing virtualized Broadband Network Gateway (BNG) and CGNAT services to its downstream ISP customers.

By deploying 7750 SR routers as edge routers, K2 Telecom could take advantage of their industry-leading inline filtering capability, delivered by the Nokia FP processor technology. With enough processing power, FP-based 7750 routers can perform security-related filtering—including DDoS traffic filtering—without compromising network performance.

These advanced capabilities of the Nokia routers allowed K2 Telecom to combine the 7750 SR platform with petabyte-scale IP security analytics provided by Nokia Deepfield Defender to deploy a highly efficient routing and DDoS protection solution.

- IP Edge routing with full 7750 SR redundancy
- Over 1.5 Tbps in IP transit service delivery
- Presence in all major internet exchange points (IXPs) worldwide, including the largest IXP in Brazil
- Forward-looking architecture with strategically distributed edge and content delivery networks (CDNs)



The brains behind K2 Telecom's anti-DDoS solution: Nokia Deepfield Defender

Deepfield Defender is a software application that combines network data (telemetry, DNS, BGP, etc.) with the patented Nokia Deepfield Secure Genome®, a cloud-based data feed that continuously tracks the security context of the internet.

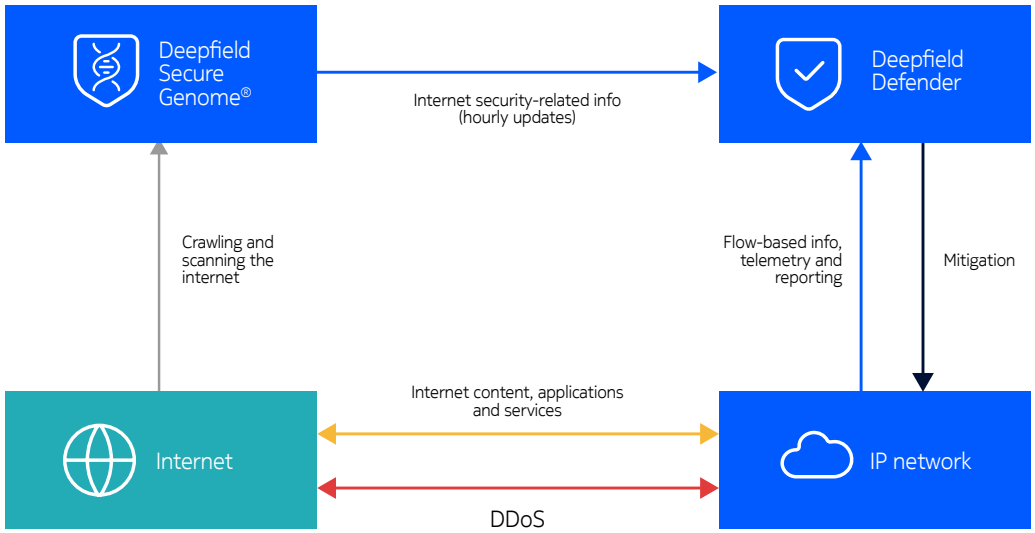
Secure Genome has detailed visibility into more than 5 billion IPv4 and IPv6 addresses, tracks more than 30 categories of internet and deploys more than 100 machine learning (ML) rules to automatically classify and precisely allocate applications and flows into security-related traffic types and categories. It "knows" the intricate security details of the internet, including prior attacks, insecure servers and compromised IoT devices that can be used for DDoS attacks.

Deepfield Defender correlates knowledge from Secure Genome with the information obtained from the network to detect DDoS attacks faster and more accurately. It drives agile network-based mitigation using advanced IP routers such as Nokia FP4/FP5-based IP routers or dedicated mitigation systems such as the Nokia 7750 Defender Mitigation System (DMS).

Using advanced AI/ML algorithms, Deepfield Defender calculates the optimal mitigation strategy for a particular DDoS attack (or multiple concurrent attacks) in real time and instructs routers or the DMS to apply these filters and neutralize the attack.

Nokia uses Deepfield Defender as the foundation for its next-generation DDoS detection and mitigation solution. Leveraging rich telemetry and the programmability of the IP network itself, Deepfield Defender offers significant benefits over legacy appliance- or DPI-based approaches. These include better scalability, more accurate DDoS detection with lower false positives and more efficient and rapid DDoS mitigation in the most cost-efficient manner. Deepfield Defender provides the holistic, 360-degree DDoS security required for 5G, cloud and the AI era.

The Nokia DDoS security solution



How K2 Telecom selected Deepfield Defender

K2 Telecom was being hit with an extremely high number of DDoS attacks from outside and inside its network every day. Many of the attacks it had observed were very brief, and the intensity and tactics changed over time. These factors made it harder to mitigate them in real time. The attacks were also affecting residential and corporate customers, as well as downstream ISPs. The company needed an anti-DDoS solution that could meet stringent requirements.

DPR Telecomunicações, Nokia's technology and solution partner in Brazil, which offers exclusive and integrated solutions for the fixed broadband internet telecommunications sector, had previously worked with K2 Telecom to introduce Nokia 7750 SR routers in its network. Recognizing the growing need for improved DDoS security, DPR proposed Nokia Deepfield Defender as a solution.

After extensively testing several solutions, K2 Telecom determined that Deepfield Defender was the only system that could respond to the latest generations of DDoS security threats, including botnet DDoS, with enough speed and accuracy to detect attacks in real time while minimizing the effects on good customer traffic. Consequently, K2 Telecom chose Deepfield Defender as the foundation for its anti-DDoS solution.

The company deployed Deepfield Defender in combination with 7750 SR-based edge routers, which it used as DDoS security enforcement points. It also chose to enhance its security capabilities with the Nokia Deepfield Emergency Response Team Support (ERTS) service, delivered by a team of security experts with broad expertise and deep experience in handling DDoS attacks.

This unique combination of AI-driven big data security analytics, advanced routing technology and expert support enabled K2 Telecom to create a secure, high-performance IP networking environment.

Impressive results during 30 days of evaluation and initial implementation:

- More than 6,900 DDoS mitigations performed
- 99.84% efficiency (zero-touch)
- DDoS attacks came from more than 24 million sources

Highlights of K2 Telecom's Deepfield Defender-based security solution

- Accurate detection of all DDoS attacks in seconds
- Agile and precise mitigation in seconds
- High-capacity defense against volumetric attacks
- 360-degree network protection against inbound and outbound DDoS attacks
- Zero-touch, 100%-automated protection
- 3.0 Tbps mitigation capacity
- No latency impact on the internet



How K2 Telecom benefited from the Nokia solution

Scalable, secure network infrastructure

By upgrading its edge routers with the Nokia 7750 SR-1 and deploying Deepfield Defender for anti-DDoS protection, K2 Telecom completely redesigned its IP edge and security layer. The company is now ready to meet new customer demands and defend its network against bigger and more complex DDoS attacks.

Increased competitiveness

The new and improved secure service offering environment has enabled K2 Telecom to set itself apart from competitors while better protecting its retail operations and delivering a premium connectivity experience for its entire ecosystem of corporate customers.

New service offerings

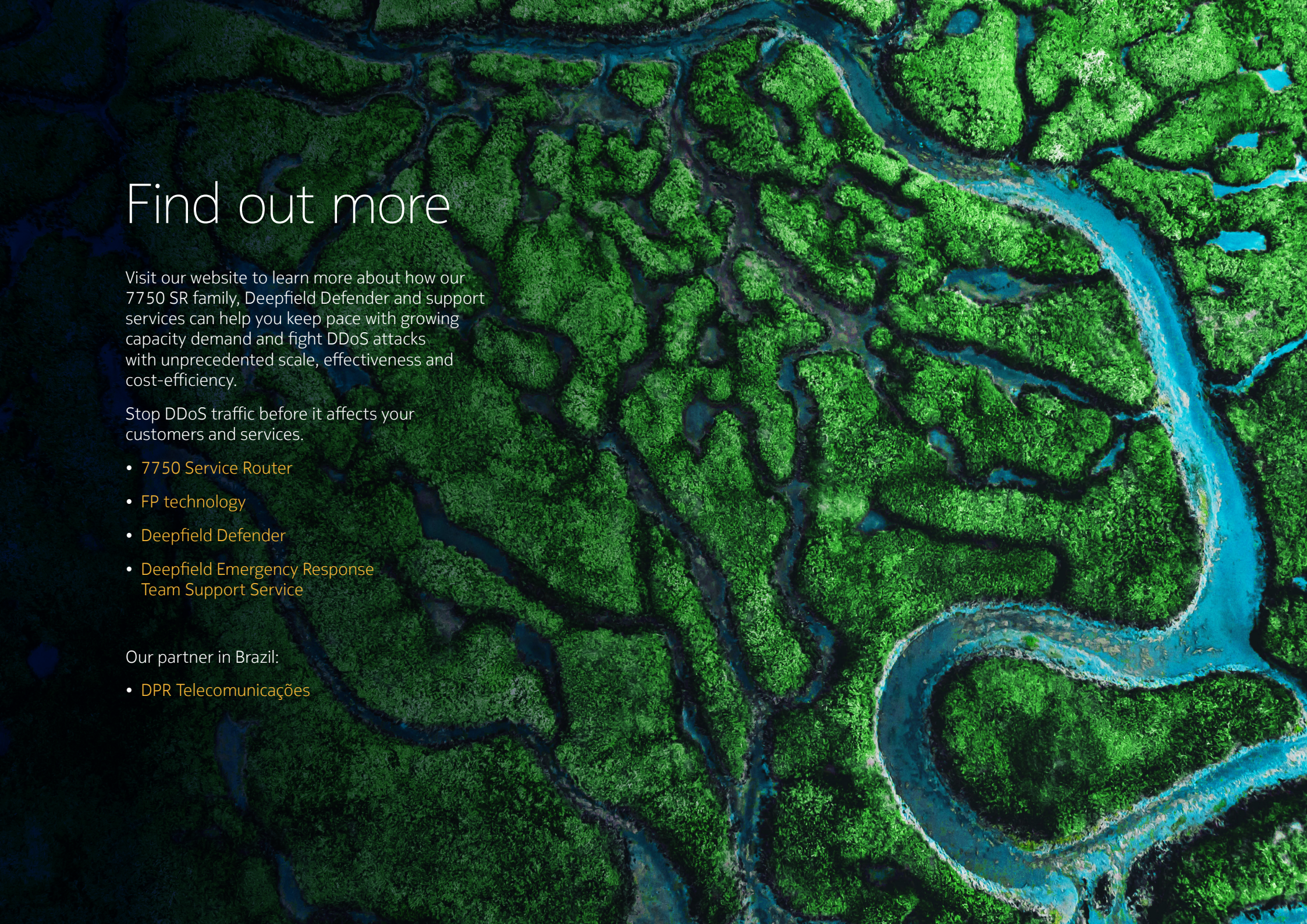
K2 Telecom used its new solution to develop and create a new secure data pipe service offering and some new wholesale products. These include BNG and CGNAT as infrastructure as a service for other ISPs and customer edge router monitoring with the Deepfield Defender platform.

Extending benefits to partners and customers

K2 Telecom's customers have also benefited from the new solution. Downstream ISPs and their subscribers get improved DDoS protection capabilities and more reliable connectivity. Enterprises have been able to shift from the "own-your-security" model to outsourcing security to their trusted partner and supplier, K2 Telecom.

Lower OPEX and greater operational control

Deploying 7750 SR with Deepfield Defender has enabled K2 Telecom to enjoy the benefits of improved router efficiency, including lower energy consumption and higher investment predictability, and stronger DDoS security. The company has reduced OPEX through the termination of prior cleaning/mitigation center contracts and gained greater control over its traffic by performing traffic scrubbing inline and within its own network domain.



Find out more

Visit our website to learn more about how our 7750 SR family, Deepfield Defender and support services can help you keep pace with growing capacity demand and fight DDoS attacks with unprecedented scale, effectiveness and cost-efficiency.

Stop DDoS traffic before it affects your customers and services.

- 7750 Service Router
- FP technology
- Deepfield Defender
- Deepfield Emergency Response Team Support Service

Our partner in Brazil:

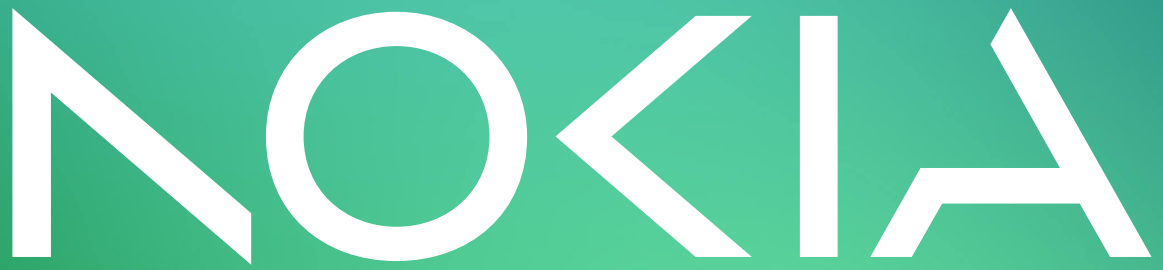
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About Nokia

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.

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