

The Nokia logo is displayed in a white, sans-serif font in the upper left corner of the image. The background is a night-time photograph of a city skyline with several tall, modern skyscrapers. The buildings have illuminated windows and balconies, and there are light trails from traffic on a road in the lower left. A large, white, stylized arrow graphic points from the right side of the image towards the center.

Broadband  
Network Gateway  
Solution brochure



# Nokia Broadband Network Gateway

## The access portal to the digital world

Broadband access is an essential utility for enabling people, communities and businesses to participate in the digital economy. Digital inclusion is essential but many homes and businesses remain unconnected or under-served.

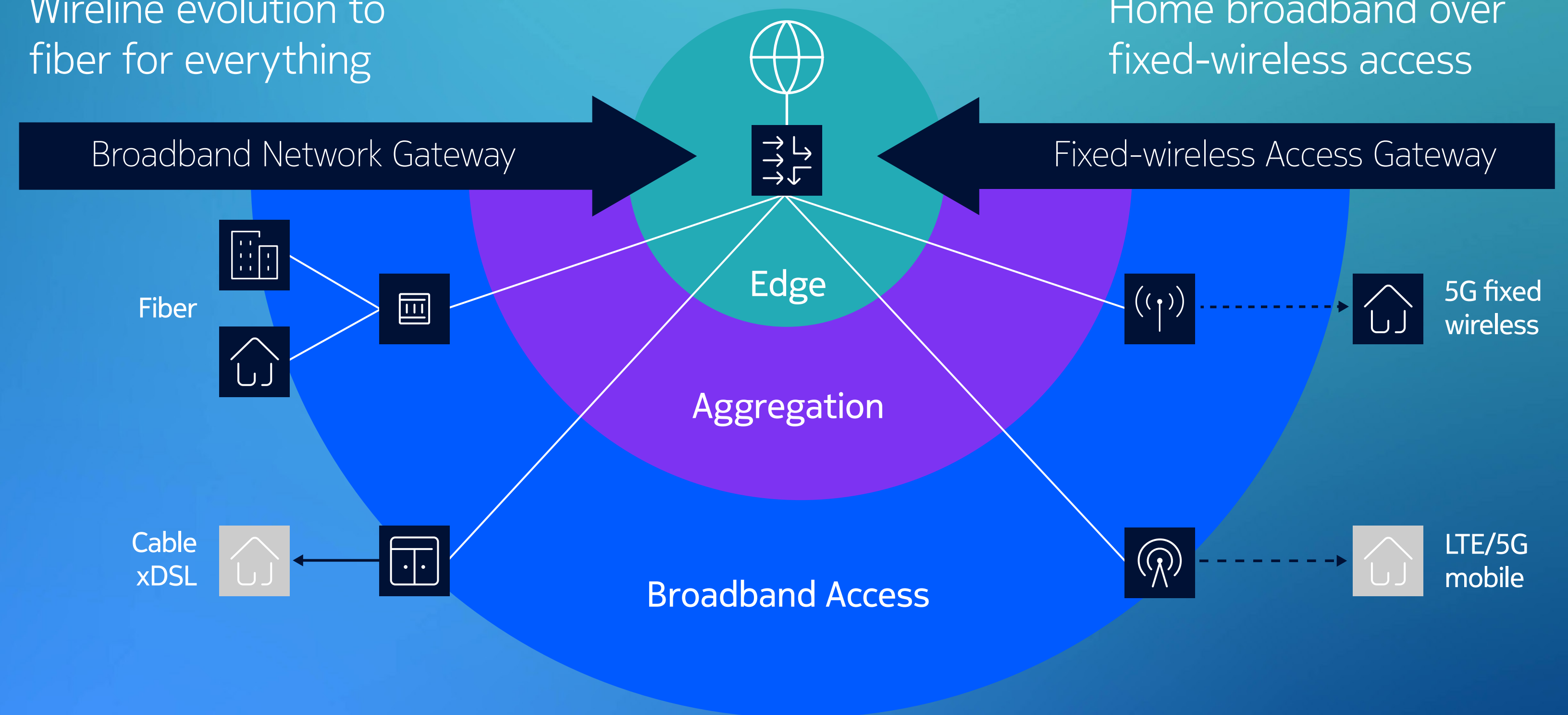
To deliver fast, affordable and seamless broadband everywhere requires a combination of wireline and fixed-wireless access (FWA) technologies.

The Nokia Multi-Access Gateway (MAG) enables you to fully capitalize on your precious investments in faster broadband access. It offers a scalable and versatile broadband edge for delivering a seamless user experience over any access technology.

## Universal broadband edge: Nokia Multi-Access Gateway

Wireline evolution to fiber for everything

Home broadband over fixed-wireless access



Universal broadband is essential to connect, collaborate and participate in the digital world. According to the World Bank, the digital economy already contributes more than 15 percent of global GDP. This share is expected to double by 2030 as digitalization expands across the entertainment, education, ecommerce, enterprises, industries, finance, healthcare and public services domains.

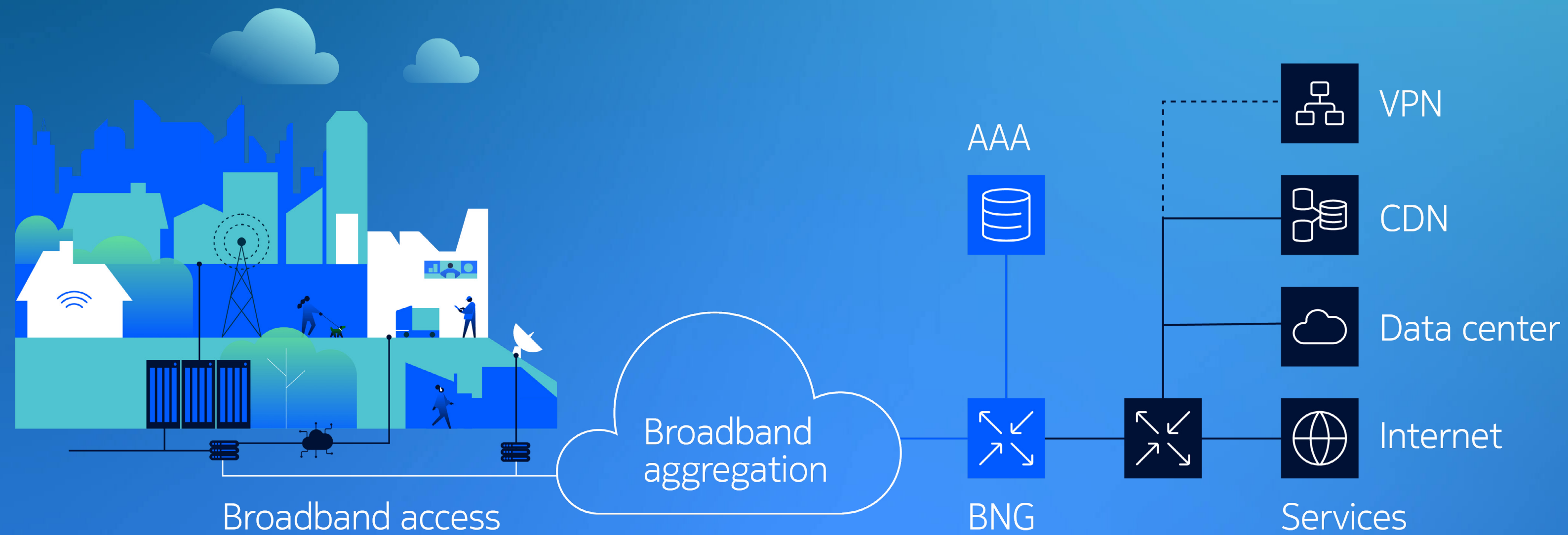
Each underserved home or business is an opportunity for growth: A better quality of life, higher productivity, a more inclusive society. Our mission is to use our broadband solutions to help the world act together and bridge the digital divide. As a global leader in broadband technology, we are involved in many projects and would love to partner with you to maximize your opportunities for delivering universal broadband.



## What is a Broadband Network Gateway?

The BNG is an essential network function that sits between the broadband access network and the IP backbone and connects to services such as the internet and content delivery networks. It authenticates and authorizes subscriber access to network services and content, enforces bandwidth policies, and records usage data for accounting purposes (AAA). Unless you also scale the performance of your BNG, your valuable investments in last mile fiber access will only create bigger bandwidth bottlenecks at the broadband subscriber edge.

## The Broadband Network Gateway manages subscriber access to network-based services





## Broadband for all, everywhere

Fiber is the fastest and future-safe access technology. But upgrading all existing copper access loops to fiber will take years and can be costly and time consuming in mature and low-density residential areas. 5G fixed-wireless access can complement fiber deployments where needed and allows for efficient sharing of wireline broadband aggregation and edge infrastructure. To manage the transition from copper to fiber access, and economically deliver broadband services everywhere, the subscriber edge must be capable to support multiple access technologies and scalable to deliver higher bandwidth.

## Delivering a better digital experience

The digital experience greatly depends on the speed and quality of broadband connectivity. For example, the transition from broadcast TV to on-demand viewing on bigger 4K and 8K TVs drove the evolution to Gigabit access. As more people work and study from home, they become more dependent on networks that can handle their increasing use of video conferencing, collaboration and cloud-based IT applications. The same is true for digital enterprises and industries, that increasingly rely on private and public cloud data centers to run mission-critical applications and AI workloads.

## Your gateway to universal broadband

The Nokia Multi-Access Gateway can be deployed as a wireline BNG for fiber-to-the-premises (GPON, XGS-PON and 25G PON) and existing fiber-to-the-node (xDSL, hybrid fiber-coax) access technologies.

In addition, operators can support 4G/5G fixed-wireless access requirements for converged wireline and fixed-wireless broadband delivery.





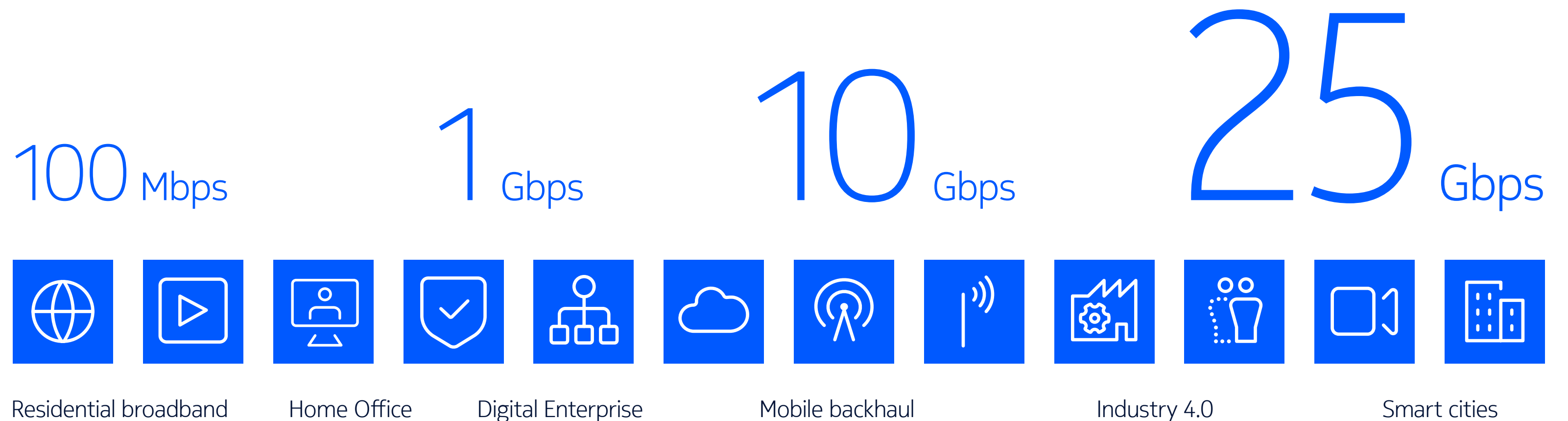
## How does the Nokia BNG ensure service performance?

A wide range of [Nokia 7750 Service Routers](#) support the BNG feature set to deliver deterministic and assured performance for all service combinations and usage conditions.

Purpose-built [Nokia FP routing silicon](#) with fully buffered ingress and egress traffic shaping ensures superior bandwidth scaling and throughput with granular quality of service for individual subscribers and services.

Our BNG helps you to ensure that broadband subscribers get the service performance they pay for, and each subscriber gets a fair share of available capacity during peak demand and congestion situations.

## Wireline broadband evolution to enable higher bandwidth applications



Streaming video, online gaming, immersive VR/AR and other real-time cloud and AI applications have very dynamic bandwidth requirements and are highly sensitive to congestion issues such as packet latency and loss. Even short glitches, hiccups and lag spikes can ruin the user experience, and loss of connectivity can ruin a business. The BNG plays an instrumental role in getting the most out of your fiber investments and ensuring a reliable quality of experience at all times.



## Broadband services you can depend on

The BNG is a mission-critical network function that keeps legitimate subscribers and personal data safe, while locking bad actors and compromised users out. The increase in broadband connectivity and capacity fuels the potential for bigger and more frequent botnet attacks that can flood networks and severely impact customer services.

As the demarcation point between subscribers and services, the BNG provides critical protection against denial-of-service attacks from compromised subscribers or the internet.

## How does the Nokia BNG protect subscribers and services?

The Nokia BNG supports a unique set of failure redundancy and built-in security features to protect itself, critical network assets and broadband subscribers against unplanned outages and threats.

Many security mechanisms can be deployed automatically in the user authentication phase to prevent malicious users masquerading as others from stealing content or hacking into network equipment.

Our BNG solutions can even help to protect operators and their subscribers against denial-of-service attacks!







## Broadband solutions for every operator

Scale has many dimensions and broadband service delivery architectures must be flexible and adaptive to support multiple access technologies, more bandwidth capacity and more services. As operators add more subscribers, services and bandwidth per user, BNG user plane and control plane requirements will evolve at different speeds. Because no single solution can fit all needs, we make the BNG solution available on multiple hardware platforms with virtualized, integrated and disaggregated deployment options.

**Rural broadband providers and utilities** serving communities with a few thousand homes will appreciate the versatility of our compact [Virtual Service Router appliances](#) (only one rack unit).

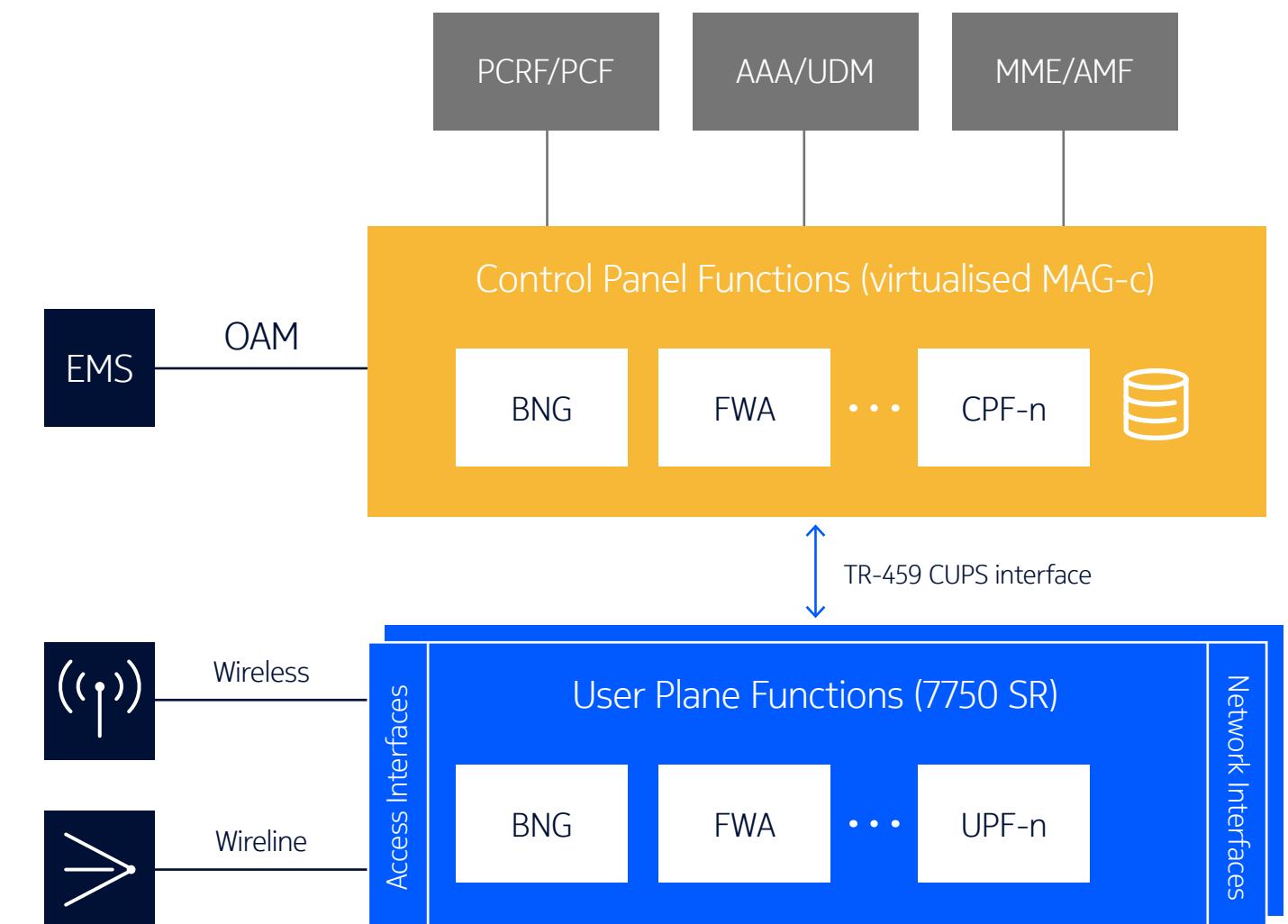
**Regional operators** will value the performance and scalability of our [7750 SR portfolio](#), which provides capacity ranging from 6 Tb/s line rates in a fixed two-rack-unit chassis to more than 100 Tb/s in a six-slot modular chassis.

**Large national operators** deploying hundreds of BNG systems will love the operational flexibility of our disaggregated control and user plane separation (CUPS) solution to efficiently serve residential and business consumers in large demographics with varying population densities.

## What is control and user plane separation?

BNG CUPS virtualizes BNG control plane functions for efficient scaling in regional datacenters, while scaling high-bandwidth user plane functions on distributed router appliances in the edge cloud.

Nokia led the [BNG CUPS standardization](#) work in the Broadband Forum and was the first vendor to deploy commercial solutions with the Nokia Multi-Access Gateway controller ([MAG-c](#)). Independently scale BNG control and user plane functions with CUPS.





Delivering better broadband to more people, more quickly is more important than ever before. Your broadband network is vital for social and economic wellbeing, for the sustainability of our planet, and for unlocking the promise of Industry 4.0, IoT and future emerging AI-powered applications. You can't just keep up; you need to keep ahead. The Nokia Multi-Access Gateway gives you a leading edge in delivering a scalable, seamless and superior broadband experience over wireline and fixed-wireless access.



## Why partner with Nokia?

Nokia is an industry leader in [broadband access](#). We pioneered digital subscriber line technology and are the market leader in GPON, 10G PON (XGS), 25G PON, and 5G fixed-wireless access. More than 300 operators rely on Nokia BNG solutions to deliver broadband everywhere.

We have a worldwide presence and pride ourselves in being one of the few vendors capable of providing you with complete end-to-end broadband solutions.

## Where can I find more information?

A great place to start is our [solution page](#), but if you want to dive into technical details, we recommend the [Broadband Network Gateway datasheet](#). To learn more about our broadband edge routers, please refer to the [7750 SR product page](#). You can find everything about fiber access on the [Fiber for Everything page](#).

**Please contact a Nokia sales representative if you have further questions or didn't find what you were looking for.**



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# NOKIA

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.

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