

A person is sitting on a concrete ledge in a park, looking out over a city skyline. The scene is framed by a large white circle. The person is wearing a grey sweater and blue sneakers. A blue bag and a skateboard are on the ground next to them. The background shows a city with buildings and trees under a clear blue sky.

Nokia Fixed Wireless Access

Fixed broadband
solutions to help you
connect more customers
and make more money

NOKIA

Contents

Why FWA	3
Route to success	6
Nokia FWA solutions	9
Use Cases	14
Why Nokia	18



It's not just mobile users waiting for 5G

Home broadband services may not be the first thing you think of using your 5G network for. But research shows it has huge potential to generate new revenues, enhance the customer experience, and accelerate your 5G ROI.

As investments in 5G accelerate around the world, there are a wealth of opportunities waiting to take advantage of 5G's speed and low latency.

Many are a few years from reaching the mainstream. But two can generate immediate revenues: enhanced Mobile Broadband, of course, and **fixed wireless access** (FWA).

Using spare capacity in your 5G network to quickly bring ultra-broadband to homes and businesses can be a game changer for you and your customers.

FWA can deliver fixed-grade broadband speeds of hundreds Mb/s and can be deployed quickly and easily.

And because the technology is tried and trusted, with Nokia solutions readily available, you could soon be generating new or improved broadband revenues.

47%

Service providers who rate FWA as second only to eMBB as the most important 5G use case

76%

Consumers like the idea of FWA

66%

Consumers who would happily subscribe to 5G FWA at the same prices as their current broadband



FWA brings better broadband and better business opportunities

5G spectrum is costly, so you want to use it to its full potential. Adding FWA broadband to homes and businesses alongside mobile services can create immediate opportunities for both mobile and converged operators and give you a competitive advantage.

Mobile operators

5G FWA enables you to enter the fixed broadband market with speeds and services that can compete with fiber-to-the-home.

You can quickly add fixed services alongside mobile, creating attractive bundled services that increase loyalty and ARPU.

A higher-tier FWA broadband connection then inevitably generates more revenue from value-added services such as cloud gaming.

Converged operators

5G FWA can deliver ultra-broadband where your other technologies may not.

Use it for rural locations where the economics don't favor fiber.

Complete a FTTH rollout to plug any coverage gaps so no home is left without ultra-broadband or left vulnerable to competitors.

Deploy FWA ahead of a future fiber rollout to keep customers loyal. Switch them to fiber when ready to free up 5G spectrum.

Go where your current fixed network doesn't to compete out of territory and grab new market share.



The key to successful FWA

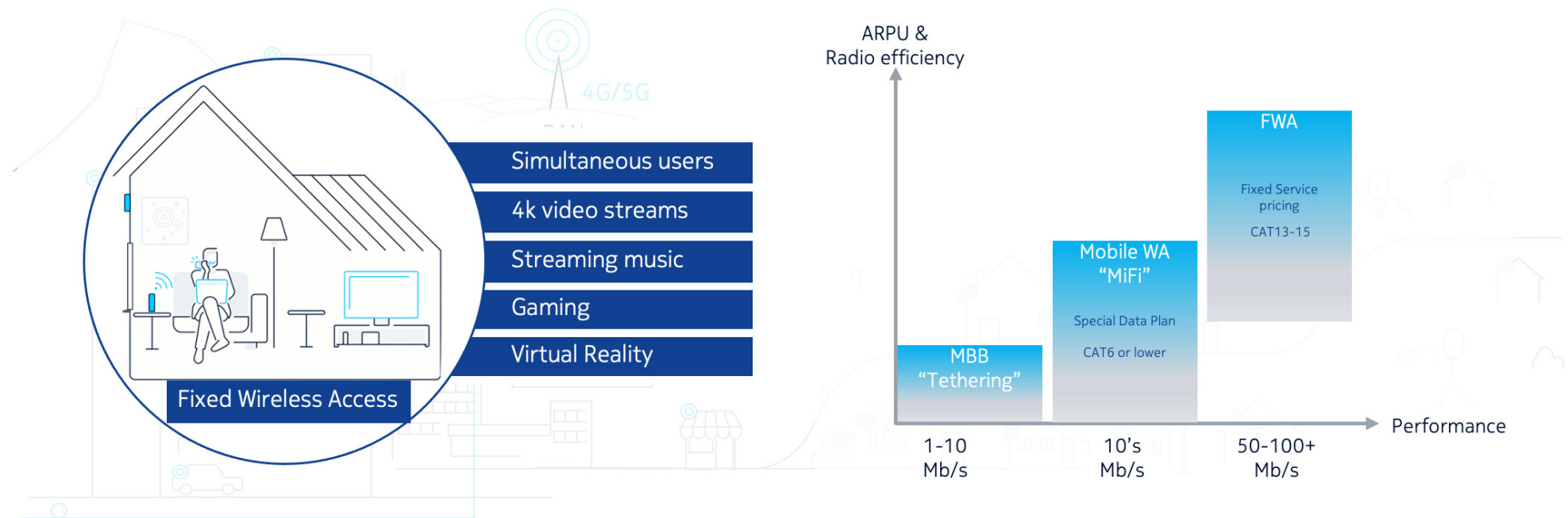
Try and stream a movie while on the move and you know the challenge involved in guaranteeing consistent service to a mobile device. The key to delivering brilliant broadband with FWA is thinking of it as a fixed service, not a mobile one. That means careful business planning, technical planning, and marketing. As you'll see in this eBook, Nokia makes it easy to overcome the challenges and ensure your customers get fast, reliable broadband using FWA.



Network intelligence knows cell capacity and radio efficiency, distance of the home from the radio cell, and any line-of-sight constraints, to determine the precise service level available and get radio planning right.

Business planning

5G FWA creates 5G revenues beyond mobility. That's because it enables a complete user experience in the home by delivering fiber-like fixed broadband services.



It's true that customers can already use 4G/5G for broadband at home. Smart phone tethering and data dongles (MiFi) work, but they are really designed for mobile convenience, not home broadband. They waste radio resources while providing limited ARPU opportunities. FWA, on the other hand, is designed to serve stationary subscribers with stationary CPE. Higher category devices, with higher gain antennas, drive higher speeds while using radio resources more efficiently. It's this efficiency which boosts the business case for FWA along with the new revenue opportunities shown above. A new FWA customer can also be connected and activated quickly and easily, with an extremely fast time-to-revenue.

Positioning FWA

Three key aspects for rolling out FWA.

Multi-play offerings



Some operators differentiate on speed. Others offer packages with voice, video, data and mobile broadband bundled in one package. With FWA, you can do both. “Multi-play” offerings reduce churn and increase ARPU with one provider, one bill and even one volume discount depending on the tier of the package.

Reduce churn, increase ARPU

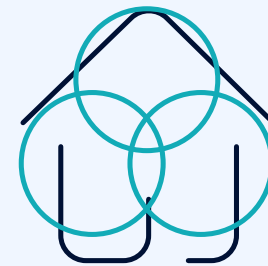
Peak bandwidth



Today “human impatience” is a killer application: customers expect an instant response when surfing, streaming or downloading. In a very tough market, FWA enables you to set your service apart by satisfying this impatience with excellent peak speeds.

Human impatience is the killer app

Home network



You don’t want the brilliant broadband you deliver to the home to be undone by poor Wi-Fi inside the home. The home network is increasingly important and, with Nokia WiFi included, you can also deliver perfect in-home Wi-Fi and have the insights and tools needed to manage both the Wi-Fi network in the home and the FWA service.

Mesh Wi-Fi for whole-home connectivity

Ensuring uptake and loyalty

Take advantage of the unique features of FWA to target the right customers with services they'll love.

Target the right customers

- Radio planning and 3D modeling tools pinpoint the addresses where you can offer great quality 5G FWA
- Customer surveys help identify consumer preferences, signs of dissatisfaction and propensity to churn

Benefits

- New customers
- Guaranteed services
- Fast time-to-market

Offer a great customer experience

5G FWA allows you to differentiate with:

- No data caps or throttled speeds
- Free or discounted trial periods to experience that 5G FWA feeling
- Zero-touch installation and activation
 - customers love a DIY approach

Benefits

- Increased satisfaction and loyalty
- Fewer truck rolls

Customer care

End-to-end service management across the FWA and in-home Wi-Fi networks give you the tools to monitor, manage and maintain an exceptional service. You then have upsell opportunities such as:

- Higher-value 5G services
- Partnerships with content providers, video streaming platforms and (cloud) gaming providers
- Bundle business internet and mobile service plans

Benefits

- Customer satisfaction
- Fewer returns
- Upsell opportunities



Something for everyone

Your customers will love our FWA devices: great looks, great features, and great performance. And with a variety of options, there's one to suit every deployment, ensuring you can deliver brilliant FWA broadband every time.

4G gateways

Leverage your 4G assets to connect fixed subscribers with this all-in-one 4G modem with integrated router and Wi-Fi for a powerful and easy-to-install broadband solution.



Integrated Nokia WiFi mesh technology for whole home coverage with Nokia WiFi Beacons.

5G gateways

With 5G in the mid-bands, these all-in-one gateways combine 4G/5G WAN with integrated router and Wi-Fi for a powerful and easy-to-install broadband solution for home and businesses.



Simple, no tools, self-install, guided by an app

Something for everyone

5G receivers

High gain antennas (9 dBi) and 4G/5G modem combined in one easy-to-install device with 180° field of view.

Can be installed on windows (indoor or outdoor), pole, wall, balcony or on a tabletop.



4G receivers

Avoid first wall attenuation and connect more customers at faster speeds with highly efficient outdoor FWA receivers combining a 4G modem with high gain antennas for rural and suburban locations.



CBRS receivers

Citizens Broadband Radio Service is a critical tool for rural broadband in the United States. Our Part 96 compliant CBRS outdoor receiver with 19 dBi gain has the power to connect remote areas.



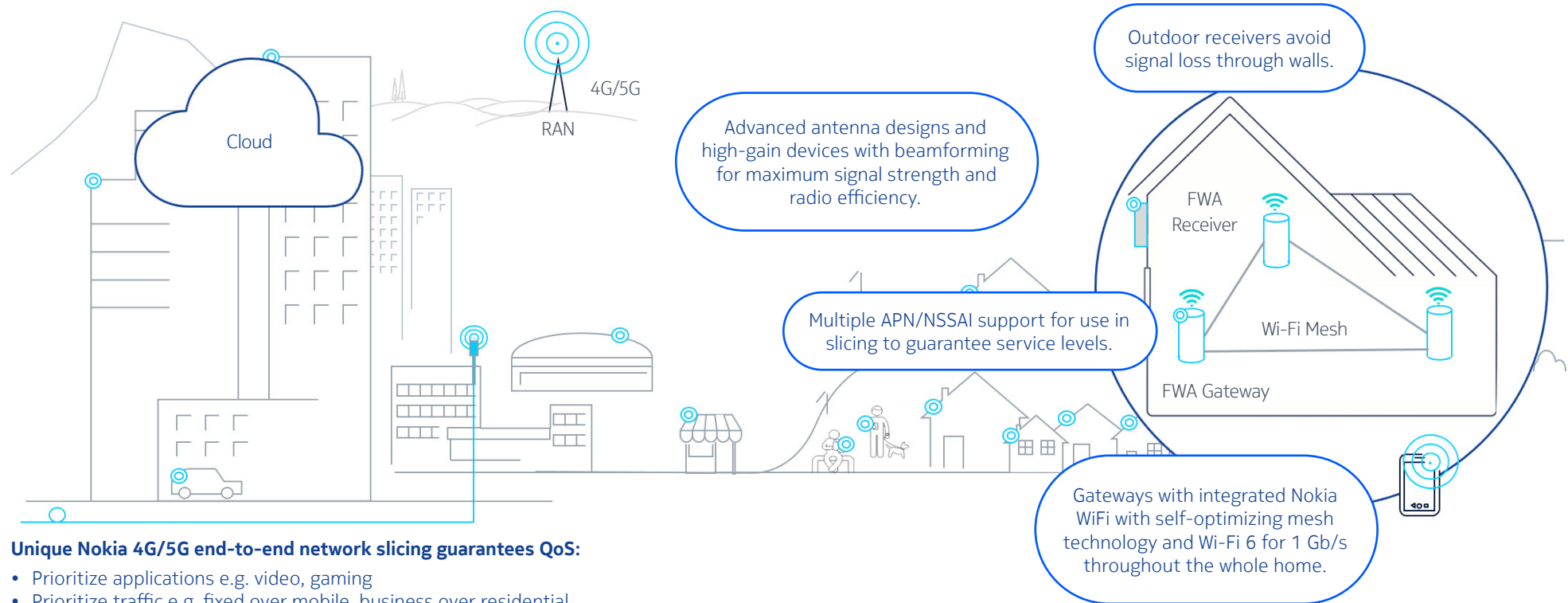
Pole, wall mount options

Performance

Nokia solutions provide the highest FWA performance possible, so your customers will be delighted with their service, and so will you.

Cloud controller provides end-to-end service performance management.

- Ensure line-of-sight
- Maximize radio efficiency
- Troubleshoot and self-optimize



Unique Nokia 4G/5G end-to-end network slicing guarantees QoS:

- Prioritize applications e.g. video, gaming
- Prioritize traffic e.g. fixed over mobile, business over residential

Monetize the home network with value-add applications

Our products are unique in the marketplace with a solid foundation to deliver the best service possible to the home and inside the home. The 5G Gateway 3.2 has built-in memory for containerized applications that can help operators to monetize their footprint in the home with differentiated and value add applications like parental control, home security, cloud-gaming, etc.

Here is a list of containerized application partners whom we collaborate with.

F-Secure

broadpeak

GameBench

ntop

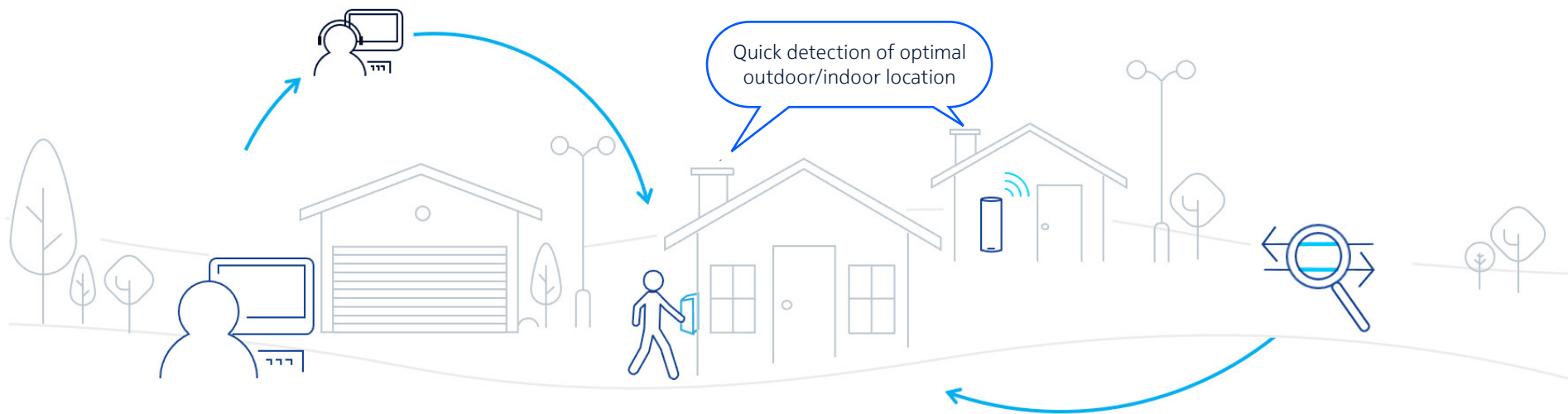
DOMOS

COGNITIVE[∞]
SYSTEMS CORP

SPEEDTEST[™]
by OOKLA

Management

Nokia gives you the tools to ensure an exceptional customer experience from start to finish.



Altiplano FastMile Controller

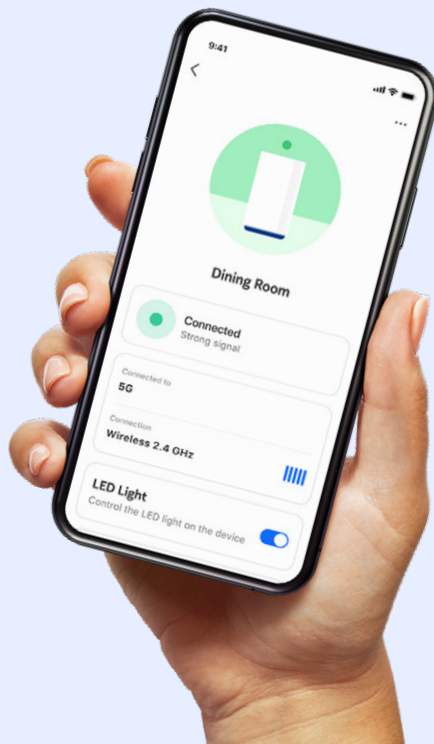
The FastMile Controller provides end-to-end FWA service lifecycle management.

1. Customers subscribe from a web point of sales portal
2. You validate service eligibility with radio planner software, knowing the guaranteed service level, type of device needed (indoor/outdoor), the optimal installation location, the preferred cells list and service APNs
3. FastMile controls the installation of the device and checks if it's in the right location
4. Home installation is guided by mobile apps
5. FastMile enables you to monitor service health, cell and CPE alarms, status and statistics, and verify if the actual service level matches expectations

Management

Nokia WiFi App

The Nokia WiFi app guides customers through installation and setup of their 4G/5G FWA gateway and Wi-Fi network, and then manage or extend in-home coverage with additional Nokia WiFi Beacons.



Nokia Wireless App

The Nokia Wireless app guides you or your customer to install outdoor receivers in exactly the right place.



Swisscom

Always aiming for technology leadership, Swisscom wanted to leverage their 5G network to bring better broadband to residential and business customers in remote and rural locations, but without impacting mobile customers.



Considerations

- Must underline Swisscom's technology leadership
- Must not compromise mobile 5G services
- Must meet minimum service obligations even in the most remote regions: 10 Mb/s download, 1 Mb/s upload
- Must enable B2B business cases with high bandwidth services (up to 1 Gb/s)

Solutions

B2C

- Hybrid deployment using FWA to boost throughput for DSL customers
- Easy self-install 5G receiver
- Mobile app to guide end-user

B2B

- FWA for temporary construction sites, payment terminals, hotels in the mountains, etc.
- Cost-efficient mobile fail-over for SME
- Easy self-install 5G receiver
- Mobile app to guide end-user

Why Nokia?

- Love the design
- A complete user experience with easy self-install
- Trust the Nokia brand inside the home



“ We have chosen Nokia as our 5G fixed wireless access device partner. This solution will help us to bring ultra-fast internet speeds to our residential and business customers in rural areas.”

Marcel Burgherr, Head of Gateways, Phones & other Devices, Swisscom

Optus

Optus, with a mobile network covering 98.5% of Australia's population, were aiming to increase market share with fast rollout of FWA in dense urban and suburban areas with poor broadband services. What's more, FWA was ahead of eMBB as their first 5G use case, so return on investment was critical.

OPTUS

Considerations

- Initially using 60 MHz channel bandwidth in the 3.5 GHz (n78) band
- Better performance than the currently available fixed broadband services
- Fast deployment and tactical pricing to grab market share

Solutions

- With Nokia's FastMile 5G Gateway, Optus can guarantee 50 Mb/s download service at lower price point than competitors
- Ability to offer premium tiers at 100 and 200 Mb/s

Why Nokia?

- End-to-end 5G collaboration
- Early partnership in 5G FWA product development
- First live 4k video streamed over FastMile 5G Gateway
- Solutions able to guarantee minimum service levels



“ Our customers who are experiencing our 5G solution in the home have very high scores. They're achieving an average of 130 Mb/s, and some of them 200 Mb/s. So that's a really strong performance and we'll continue rolling that out.”

Kelly Bayer Rosmarin, CEO Optus

Zain

Zain wanted to use its impressive mobile network and reputation to become a fixed broadband player. An aggressive 5G FWA rollout is doing just that, increasing ARPU from 5G customers in the process.



Considerations

- Accelerate fixed broadband market share
- Adoption of smart home and office with stronger signals, enhanced connectivity, and ultra-high data speeds
- Assist in Zain KSA's digital transformation and 5G expansion strategy

Solutions

- Nokia FastMile 5G Gateway 3.1 with eSIM delivers stronger signal, better connectivity and ultra-high data speeds to every corner of homes and offices
- Improving the customer experience with enhanced connectivity for smart devices through 5G and Wi-Fi 6
- Self-optimizing mesh Wi-Fi 6 solution for real time Wi-Fi performance optimization
- Quick and easy account setup by using the latest eSIM technology instead of a physical SIM card
- Converged fixed-mobile bundles attracting subscribers and increasing ARPU

Why Nokia?

- Extensive 5G collaboration to achieve the best possible coverage, stability and bandwidth for Saudi Arabia
- Nokia Wi-Fi mesh technology with easyMesh to offload 5G traffic
- eSIM to speed up digitalization



“We are delighted to strengthen and expand our relationship with Nokia for 5G FWA using its FastMile gateway to ensure that our home and small business customers can enjoy the fastest and most reliable broadband.”

Eng. AbdulRahman bin Hamad AlMufadda, Chief Technology Officer, Zain

Mobily

Mobily chose to pilot FWA slicing as a way of guaranteeing high quality broadband services to priority customers. It worked.



Considerations

- Be able to rapidly provide, manage and assure FWA service tiers and premium services to residential and business customers
- Slice the network by traffic type (mobile, FWA), service (residential, business), or application (data, IPTV, online gaming)
- Set priority parameters to offer guaranteed performance for each slice independently

Solutions

- Nokia 4G/5G end-to-end network slicing solution including 4G/5G RAN, FastMile 4G/5G FWA gateways and cloud applications
- 4G/5G network slicing across a multi-vendor environment

Why Nokia?

- Slicing solution is unique in the market
- Can partner for all 4G/5G needs
- 3rd party/multi-vendor interoperability



“Mobily and Nokia are proud to be the first in the world to pilot 4G and 5G FWA slicing. This technology will enable us to rapidly provide new services and high-quality customer experience to consumers and enterprises.”

Alaa Malki, CTO, Mobily

World leader in broadband, 5G and FWA

FWA brings together the best of fixed and mobile technologies.
So who better to partner with you than the leader in both?

January 26, 2023

Market leader

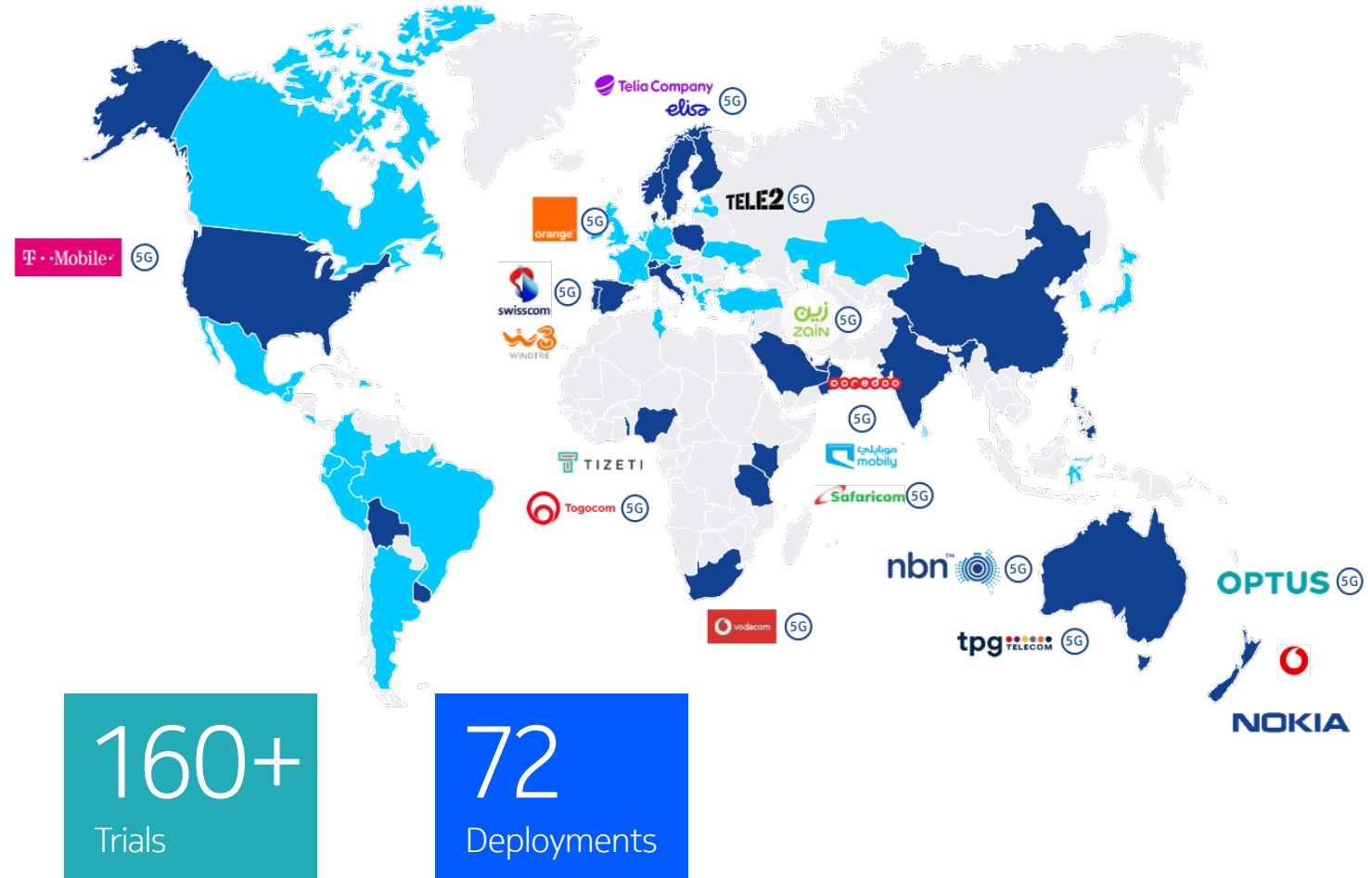
- Early lead in 5G FWA with key wins
- Trusted partner to 250+ operators
- 15+ years' experience with carrier-grade fixed networks CPE
- Expertise across, 4G, 5G, FTTH, FTTX and FWA

Innovator

- Advanced antenna designs for better coverage, performance and RAN use
- Proven performance against competing solutions
- Nokia managed mesh Wi-Fi 6

Crowd pleaser

- Ease of installation
- Smart phone apps and Wi-Fi console
- Visually appealing in the home
- End-user brand perception
- Reduced OPEX and increased customer satisfaction



Nokia OYJ
Karakaari 7
02610 Espoo
Finland

Tel. +358 (0) 10 44 88 000

CID:210386

© 2023 Nokia

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.

Nokia is a registered trademark of Nokia Corporation. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.