MWC GSMA

BARCELONA
26 – 29 FEBRUARY 2024
FIRA GRAN VIA

5G Futures Summit

Wednesday 28 February 2024
09:30 - 13:00 CET
Hall 6, Stage C

#MWC24

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Session 2: Towards a standalone future with 5G-Advanced

10:40 - 11:50

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Welcome

5G Futures Summit, Session 2 agenda

Moderator
Barbara Pareglio
Technical Director
GSMA

TIME (70-minutes)	SESSION
10:55 – 11:05	**Keynote** from e& UAE
11:05 – 11:15	**Keynote** from Zain KSA
11:15 – 11:25	**Keynote** from Qualcomm
11:25 – 11:50	**Panel discussion** with du, Huawei, Nokia and Verizon

Meet our speakers

Mahmoud Sherif
VP, Head of Innovation and Technico-Business Development
du

Marwan Bin Shakar
SVP Access Network Development
e& UAE

John Gao
President of 5.5G Domain
Huawei

Fran Heeran
Senior Vice President & General Manager - Core Networks
Nokia

Rajen Vagadia
VP, Business Development
Qualcomm

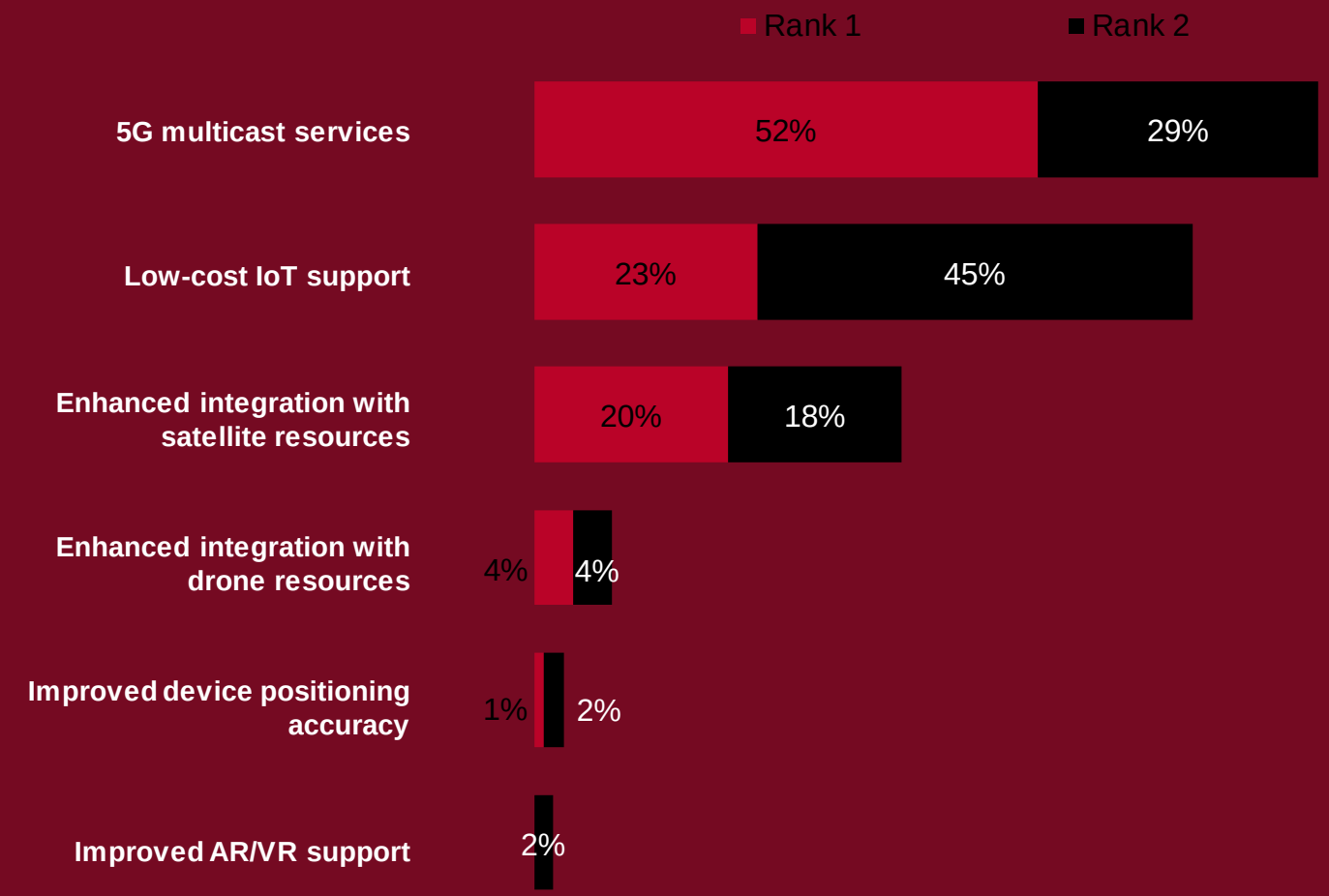
Michael Zirkle
Vice President, 5G Commercialization
Verizon

Mohammed Abdulaziz AlNujaidi,
Engineering Executive General Manager
Zain KSA

5G SA & 5G-Advanced
Market update and latest release from GSMA

Barbara Pareglio
Technical Director
GSMA

5G-Advanced and the return of multicast



Source: GSMA Intelligence Global Mobile Trends 2024 - Enter AI and the 'open of everything'

As of Q3 2023, a total of **134 operators** from **60 countries** had launched or demonstrated intent to launch 5G SA networks

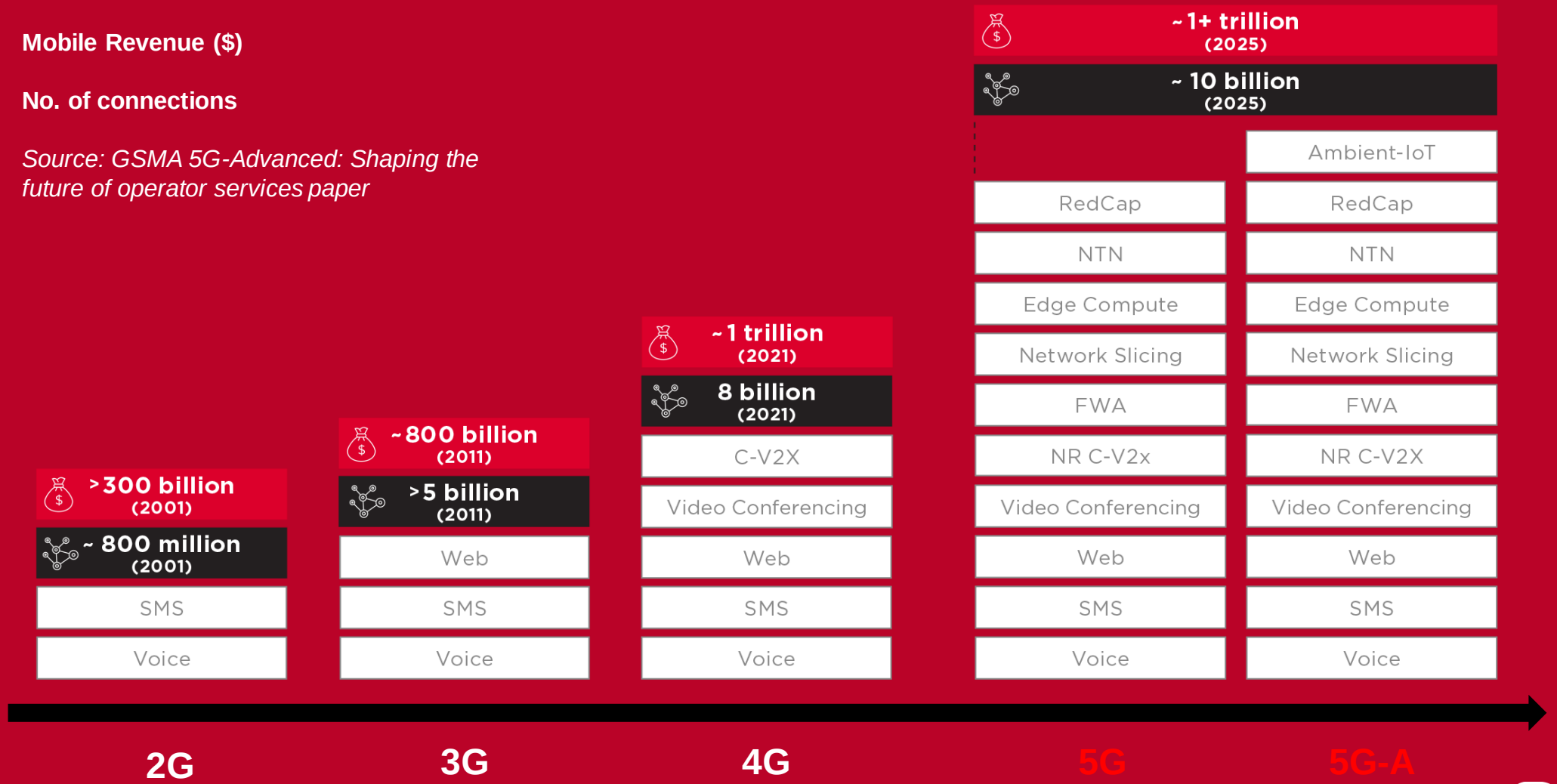
GSMA

5G-Advanced is the next step in the development of cellular technologies

Mobile Revenue ($)

No. of connections

Source: GSMA 5G-Advanced: Shaping the future of operator services paper



GSMA

Subscribe
GSMA 5G Futures Community

GSMA

Supporting 5G-Advanced in 2024

GSMA 5G Futures Community

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Up next

Marwan Bin Shakar

SVP Access Network Development
e& UAE

Advancing horizons: Unlocking the future with 5G-Advanced

Advancing Horizons: Unlocking the Future with 5G Advanced

Marwan Bin Shakar, SVP – Access Network Development

e& UAE

Feb 2024

Advancing Horizons

01

02

03

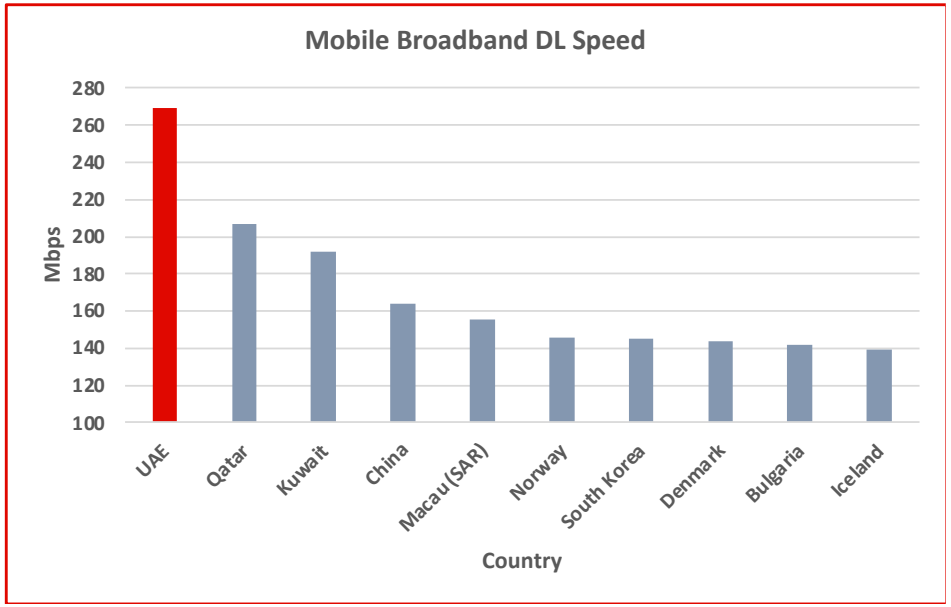
Technology Leadership

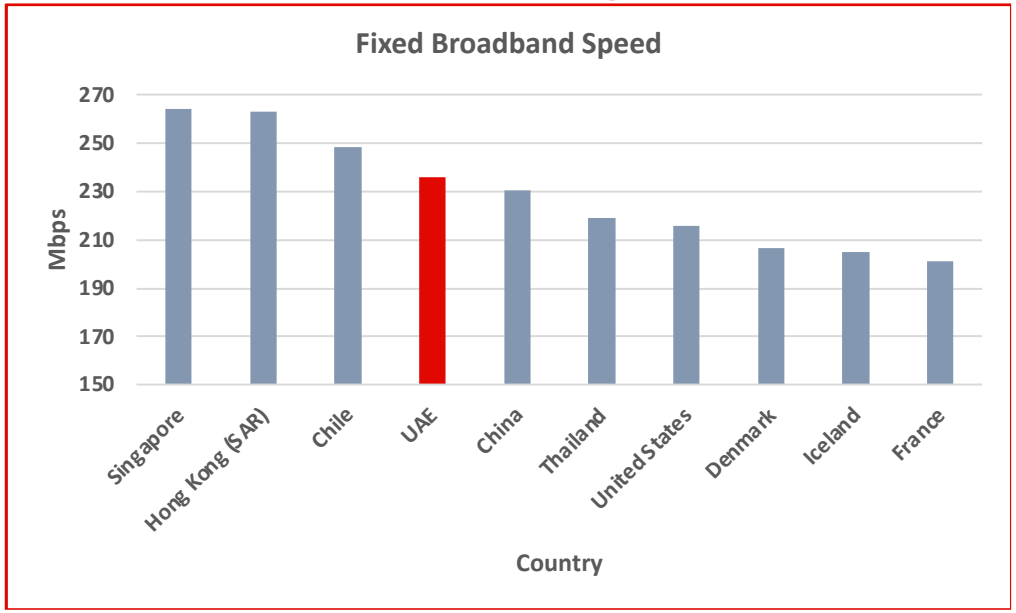
5G-Advanced Evolution

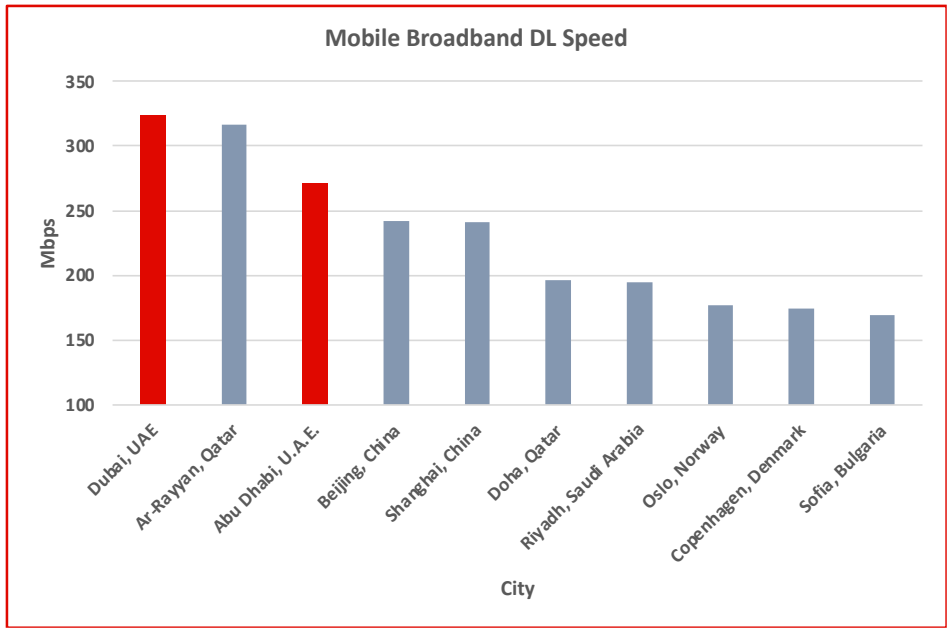
e& UAE 5G-Advanced Roadmap

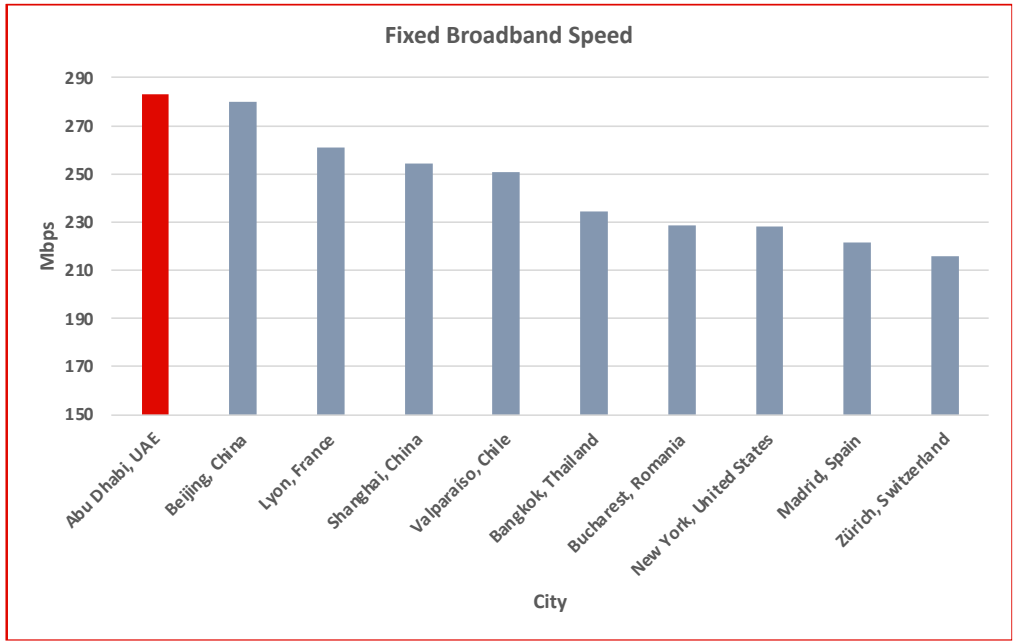
Confidential

Technology Leadership – Mobile and Fixed Global Benchmarking









Source: Ookla

Confidential

Technology Leadership – Unprecedented 5G Journey

0

2019

5G Launch

First Operator in the MENA to launch 5G to consumer

1

2021

5G SA Readiness

2

VONR Readiness

Static E2E Slicing Architecture

2022

3

2023

Private Network

First Commercial Launch

4

5G Slicing

Live network testing

2023

5

2023

5G SA Launch

1st Telco In the UAE

5G SA Speed

World fastest 5G SA download speed @13.2 Gbps announced during GITEX 2023

6

5G-Advanced

Dynamic Slicing

2024+

Enabling advanced use cases for diverse verticals to realize the full potential of 5G

Confidential

& UAE 5G Commercial Use Cases

Home Wireless

Home Wireless Advance

12 months commitment

199.00 AED/month

~~399.00 AED~~ 5% VAT excluded

Limited Time Offer: 50% OFF!

- Local Data **Unlimited for 12 months**
- Optional **5G Router**
- Free 24 hours* delivery

Buy

Home Wireless Premium

24 months commitment

299.00 AED/month

~~399.00 AED~~ 5% VAT excluded

Limited Time Offer: 25% OFF!

- Local Data **Unlimited for 24 months**
- Included **5G Router**
- **STARZPLAY ****
- Free 24 hours* delivery
- Free **GoChat Premium ****

Buy

Business

5G Private Mobile Edge

Pick between Public or Private Mobile Edge Computing to enable new use cases that demand lower latency, reduced backhaul, and data localisation.

REQUEST A CALLBACK >

5G Wireless Lines

Leverage the turnkey 5G portfolio encompassing high performance 5G connectivity, 5G routers, backed by managed service expertise.

REQUEST A CALLBACK >

5G Private Campus

Adapt to your evolving connectivity needs to improve reliability and flexibility of your campus locations. Fulfil your demand of range, mobility, performance and more.

REQUEST A CALLBACK >

Get the 5G advantage through

10X
Promised Low-Latency
Promising latency as low as 5ms

10X
Connection Density
Efficient signalling for IoT Connectivity

10X
Heightened Throughput
More unified, multi-GBPS peak rates

100X
Network Efficiency
Augmenting network energy utilisation with resourceful processing

3X
Spectrum Efficiency
Achieving more bits per HZ using enhanced antenna techniques

100X
More Traffic Capacity
Operating network hyper-densification with smaller cells everywhere

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Advancing Horizons

01

02

03

Technology Leadership

5G-Advanced Evolution

e& UAE 5G-Advanced Roadmap

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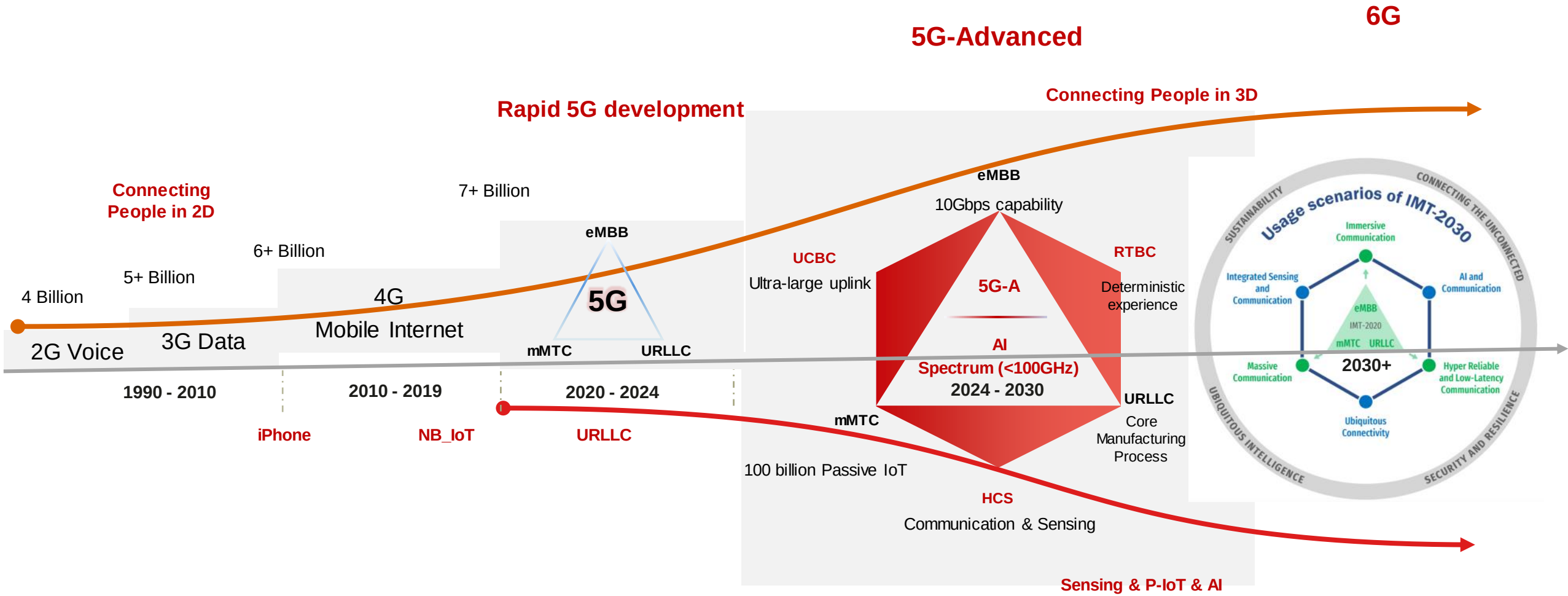
Mobile Industry has made a leap every ~10 years



5G-Advanced paves the way to 6G

Source: e& UAE 5-Advanced White Paper, 5G-Advanced: The Future of Wireless Communications in the UAE, https://www.eand.com/en/news/3-jan-2024-etisalat-by-eand-launches-white-paper.html

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Advancing Horizons

01

02

03

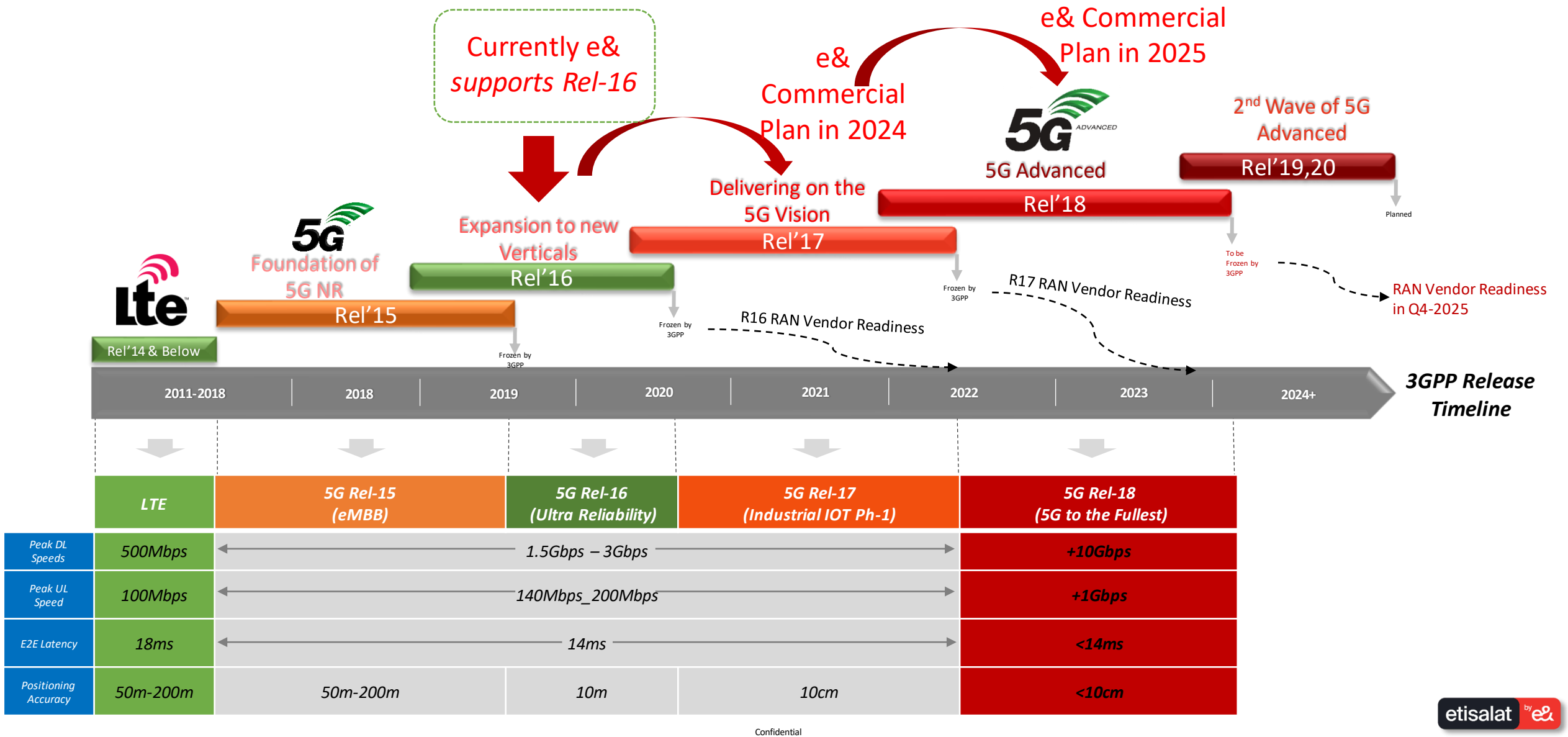
Technology Leadership

5G-Advanced Evolution

e& UAE 5G-Advanced Roadmap

Confidential

&UAE 5G-Advanced Roadmap

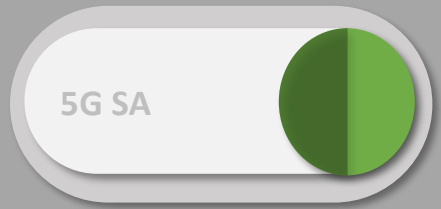


Confidential

e& UAE is stepping towards 5G – Advanced with the Activation of Underlying Technologies (5G SA, 5G For Enterprise, Field Trials of High Speeds)

5G Standalone

- etisalat by e& has commercially launched 5G SA in UAE in 2023.
- New Service Based Architecture (SBA) based 5G Core has been deployed.



5G SA VONR Slicing

NETWORKING , INFRASTRUCTURE October 15, 2023 02:04 PM GST

etisalat by e&: 5G Stand Alone network now available for all mobile users in UAE

etisalat by e& has moved to the next stage of 5G, previously customers were using a 5G radio access network on an existing 4G LTE network

On Track Towards Industry 4.0

- Digital Transformation of IIoT using 5G network (Private and Hybrid) to address different use cases.
- Use cases Monetized: Video Surveillance, 5G Leased Line, 5G Edge, 5G Private Network, and 5G Campus.

Etisalat and Huawei Unveil 5G RedCap Services at GITEX 2023

etisalat by e& UAE completes region's first 5G network trial for onshore drilling

ABU DHABI, 13th March, 2023 (WAM) -- etisalat by e UAE today announced the successful trial of 5G network capability covering multiple locations for an oil gas corporation with the highest standard of data security and digitalisation over a mobile network capable of delivering large amounts of data reliably.

5G-A Initiatives

- 5G New spectrum initiatives **(600M, 6GHz).**
- 5G High Throughput Field Trials **(13Gbps , 10Gbps).**
- 5G AI/ML Management Platform.

NETWORK & TECHNOLOGY

etisalat by e& 5G-advanced network speed trials

29 Aug 2023

etisalat by e& completes groundbreaking 5G-advanced network speed trials

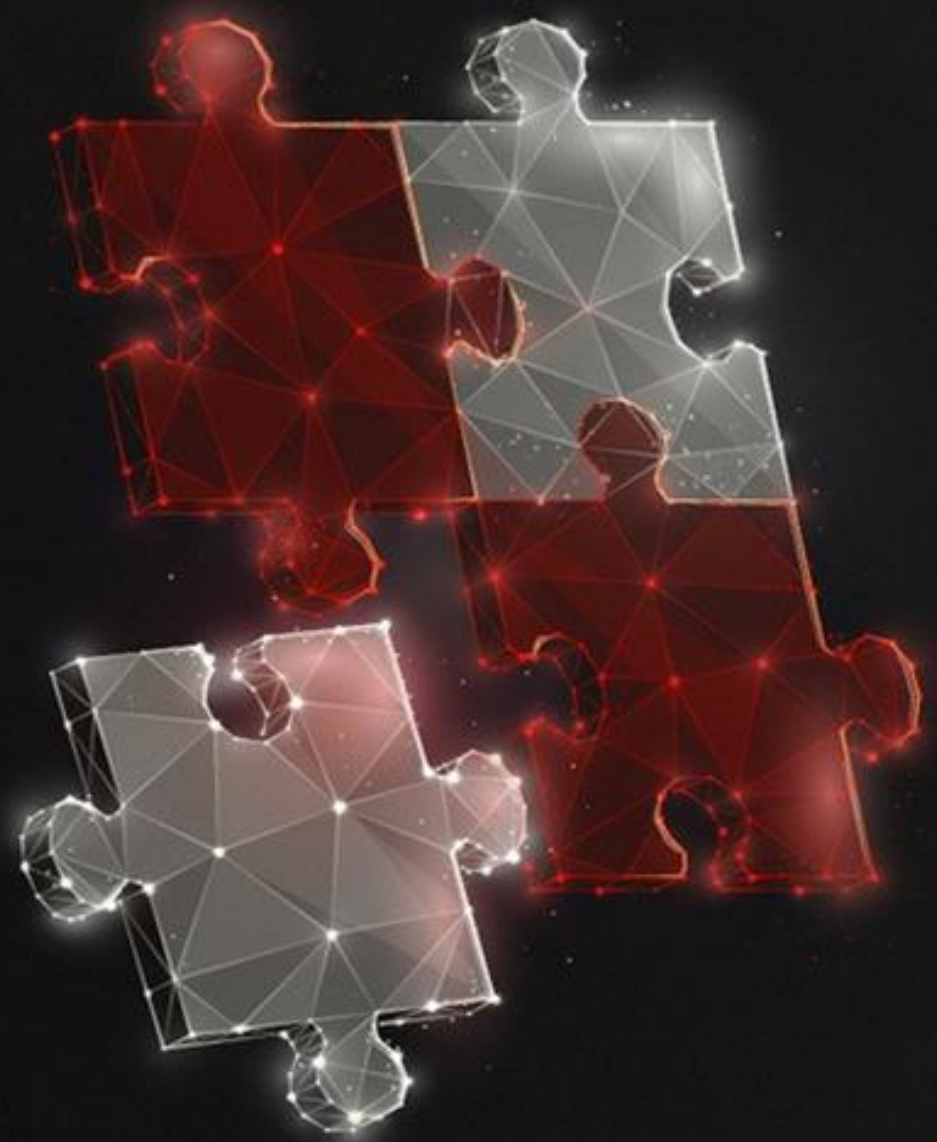
Etisalat by e& and Ericsson Achieve 5G Downlink Speed of Over 13 Gbps

Reported By SRIKAPARDHI | OCTOBER 16TH, 2023 AT 05:10 PM

Final Goal

5G Advanced

Y2025



Together:

Set to Succeed

e& UAE

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Up next

Mohammed Abdulaziz AlNujaidi
Engineering Executive General Manager
Zain KSA

Strategic implementation guide towards 5.5G

Zain – Strategic Implementation Guide Towards 5.5G

Mohammed Abdulaziz AlNujaidi

Engineering Executive General Manager

Zain KSA

Zain KSA, Leading the 5G Business toward 5.5G Era

2019

***First** in KSA to Launch 5G FWA Service*

2020

***First** to Active 5G Cloud Gaming*

2021

***Best** 5G User Growth*
Deploy 5G with 2CC

2022

***Attractive** Packages for 5G FWA*

2023

***Fastest** Growth in FWA Subscriptions*

2024

***Step** into 5.5G era*
FWA2.0

Awards

Innovations

Leap23
~3Gbps Exp.

RedCap

Passive IoT

Awards

Saudi Arabia's Vision 2030 – Strategy to Execution

10 Giga Society will be key Driver for Achieving vision 2030

2023

- ✓ Giga City in Riyadh
- ✓ 300Mbps per user is base line

2025

- ✓ Giga City in Top18 Cities
- ✓ 500Mbps per user is base line

2030

- ✓ 10 Giga City in TOP18 Cities
- ✓ 1000Mbps per user is base line

3D/XR Require 5.5G Large Capacity and Deterministic Latency

3D Immersive Service with New Terminals

Glasses-free 3D

3D Pad

3D Phone

Mixed Reality

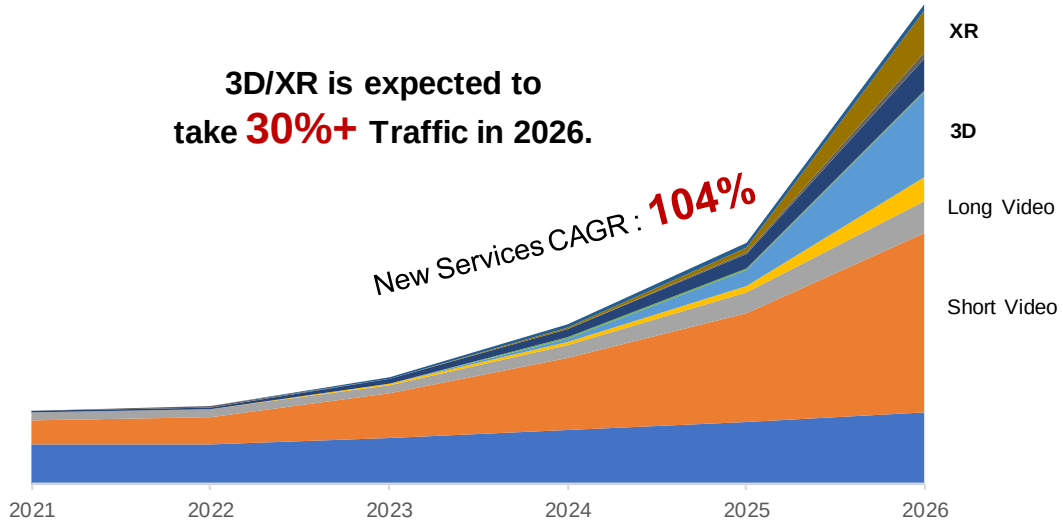
Quest

2*4K@90fps

Vision Pro

200~500Mbps

3D Services will Increase Traffic Requirements



5.5G Opens a New Life for the Home Living

All-scenario Future Family life

DL : 300~500Mbps

HD Video: 8K

DL : 20Mbps
UL : 20Mbps
20ms@95%

Video Call: 4K

DL : 120Mbps
20ms@95%

VR Sports: 4K*2

DL : 40Mbps
20ms@95%

Glasses-free 3D Game 1080P*2

Applications & Device Developing, Higher Speed is Coming

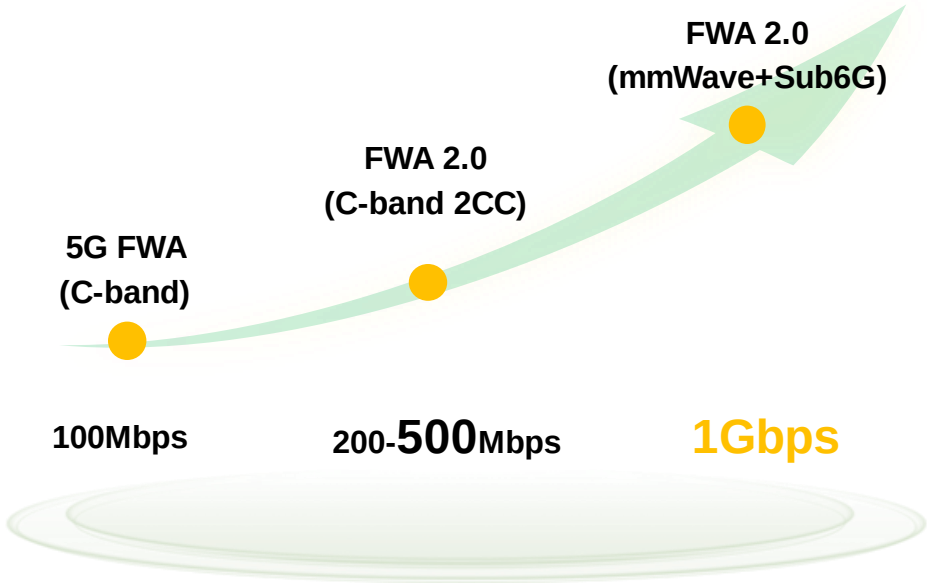
(100Mbps -> 300/500Mbps)

	FWA Speed Requirement (Mbps)		
	23Q4	24Q4	25Q4
Connected Device#	7	9	10
Applications	UHD/2D	4K/3D	8K/XR
Speed Requirement	140	254	461

Assumption: 3 TVs & 3~4 smartphone & 2~3 pad/PC, per House

* source: Zain KSA insight

5.5G Enable FWA to FWA 2.0



Zain KSA, Aiming to Develop Full Scenarios FWA Business in KSA

FWA Update Experience, Zain KSA Leading HBB Services

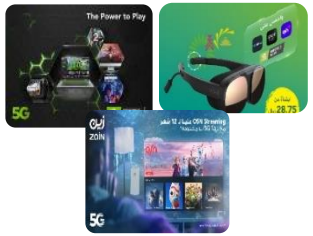
1

1st FWA business Fast 5G Monetization

- Fast Deployment
- High quality devices

2

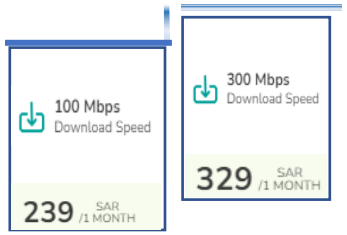
1st FWA combo package Expand HBB Market



- Rich content Involved
- Higher Speed

3

1st FWA Plus package Continuous Business Success



- Higher Speed: 300Mbps
- Smart home IoT involved

2019-2020 | 2021-2022 | 2023~

Go Higher, Go Wider With Infrastructure Evolution

1

Monetize Experience

Higher

500 Mbps

Unguaranteed Speed

5G/5.5G CPE Pro5/6

5.5G CPE MeiG

Premium experience for high value users

2

Offload 4G traffic

Wider

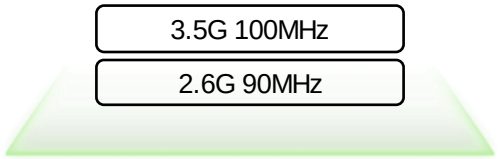
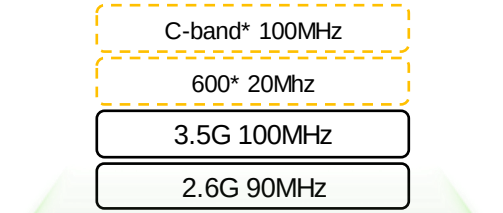
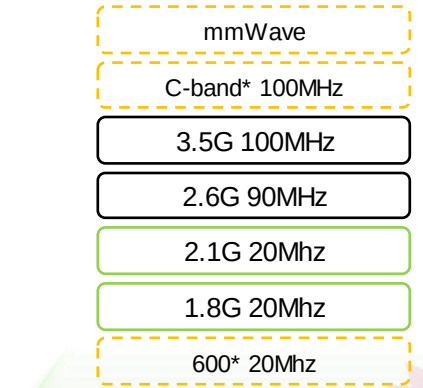
Up to 100 Mbps

20-30Mbps

Redcap CPE

4G CPE migrate to 5G/5.5G

Zain KSA, Build Best 5.5G Service Oriented Network

	2023	2024~2026	2027-2030
Services	**Differentiated FWA2.0** experience for diversified market segment	**IoT (**RedCap**)** CCTV for public security governance requirements	
5.5G Plan	**5.5G City** **Riyadh:** 2CC alignment 34%	**5.5G Phase I launch** **Top 8 cities:** 2CC alignment ratio 80% 3CC in High-Value Area	**5.5G Phase II launch** **Top 18 cities**: 3CC 80%
Network *New added C-band from acquisition or auction			
Performance	DL ≥ **3Gbps** / UL 300Mbps @Peak DL ≥ 300Mbps / UL 30Mbps @ Commercial	DL ≥ **5Gbps** / UL 500Mbps @Peak DL ≥ 500Mbps / UL 50Mbps @ Commercial	DL ≥ **10Gbps** / UL 1Gbps @Peak DL ≥ 1Gbps @ Commercial UL ≥ 100Mbps @Commercial

Thank you

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Up next

Rajen Vagadia

VP, Business Development
Qualcomm

Entering the 5G-Advanced era

Qualcomm

Barcelona, Spain

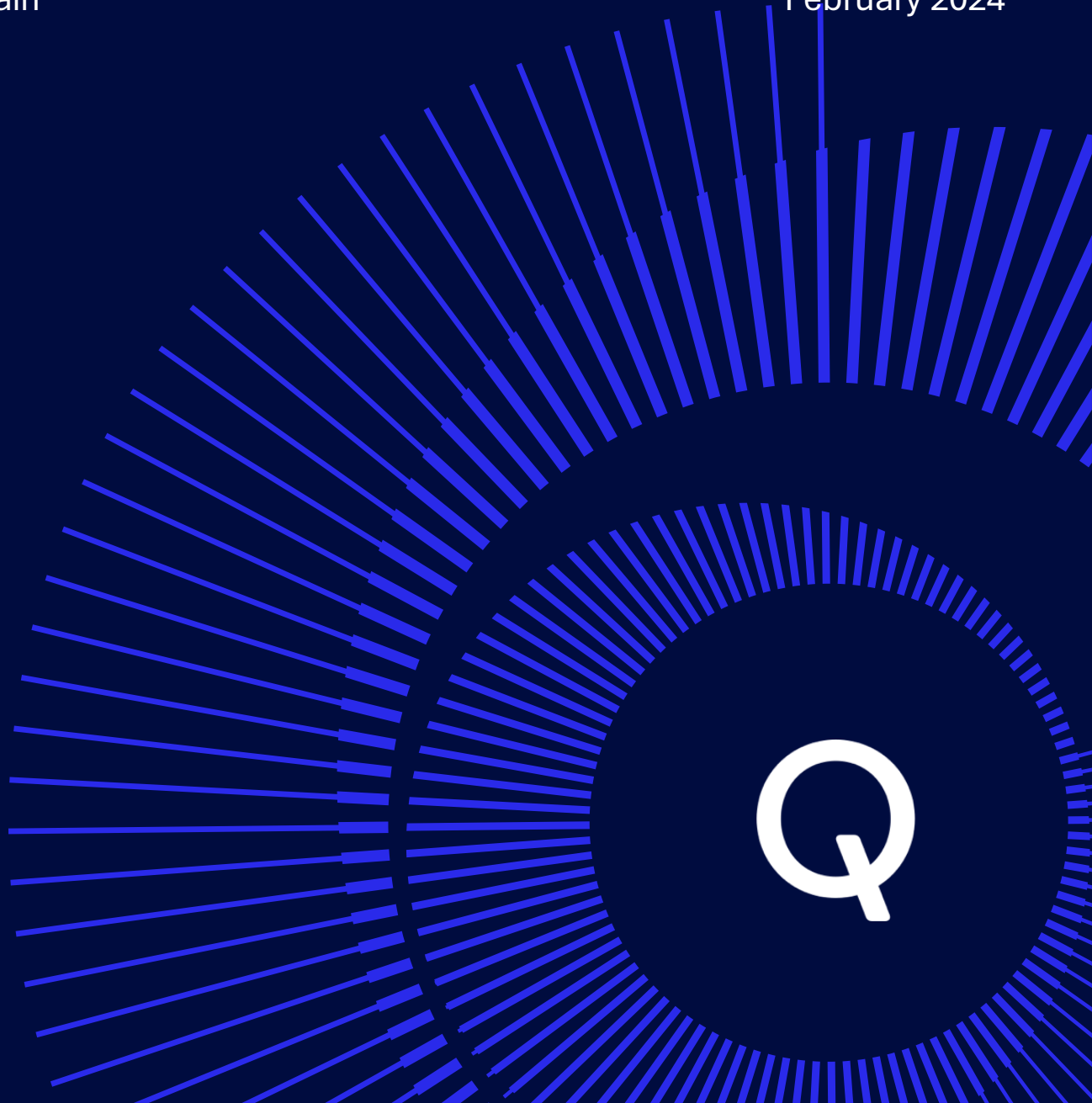
February 2024

Entering the 5G Advanced era

Rajen Vagadia

Vice President, Business Development

Qualcomm India Pvt. Ltd.



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5G Standalone is the pivotal step to drive 5G evolution

Operators transition from LTE to 5G

5G Standalone

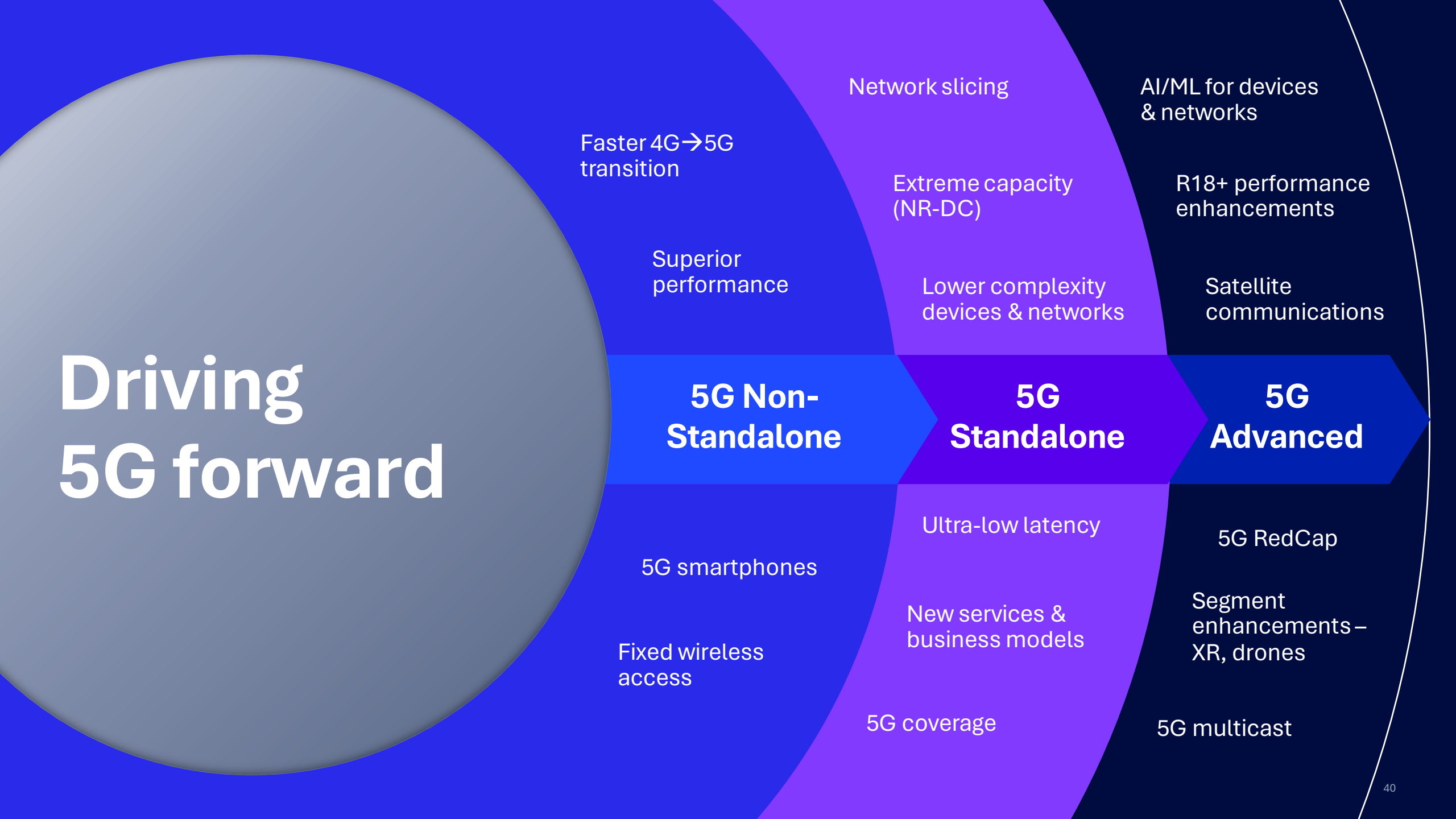
5G Advanced

Strong 5G momentum sets stage for global expansion

5G SA triggering sustainable economic and business growth

Snapdragon
X75 5G modem-RF
1st 5G Advanced-ready solution

Driving 5G forward



5G Advanced

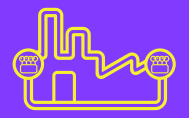
commercialization vectors in 2024-27

AI / ML
enhancements for devices and networks

Algorithms and optimization for improved device/ network performance and operations

Performance
enhancements for devices and networks

Devices and networks across throughput, coverage, reliability and power metrics



RedCap
for IoT and fixed wireless access

Power-efficient, cost-optimized IoT, compute, FWA devices and premium IIoT applications

Satellite
mobile communications (NR-NTN)

Communications using standards based non-terrestrial technologies (NR-NTN, NB-NTN)

But we can’t get to 5G Advanced without **5G Standalone**

5G Standalone accelerating globally

< 25% of global operators

Few SA sites in some networks

Source — GSA October 2023 5G Standalone member report
2 – Source - GSMA Intelligence Operators in Focus – Network Transformation Survey 2023
3 – Source – GSA Global status update report, 5G Standalone – July 2023

Key operators SA status[3]

Launched

AIS Thailand
China Mobile
China Telecom
China Unicom
Claro Brazil
Dish
Etisalat UAE
FarEastOne Taiwan
KDDI
KT
NTT Docomo
Orange Spain
Reliance Jio
Rogers
SingTel
SKT
Softbank
STC Saudi Arabia
T-Mobile USA
TEF Brazil
Telstra
TIM Brazil
TM Taiwan
TPG Australia
TSM Taiwan
Vodafone Germany
Vodafone UK

Deploying

AT&T
Deutsche T (private)
Fastweb
LGU+
TIM Italy
US Cellular
Verizon
Virgin UK
Vodafone Spain

Planned

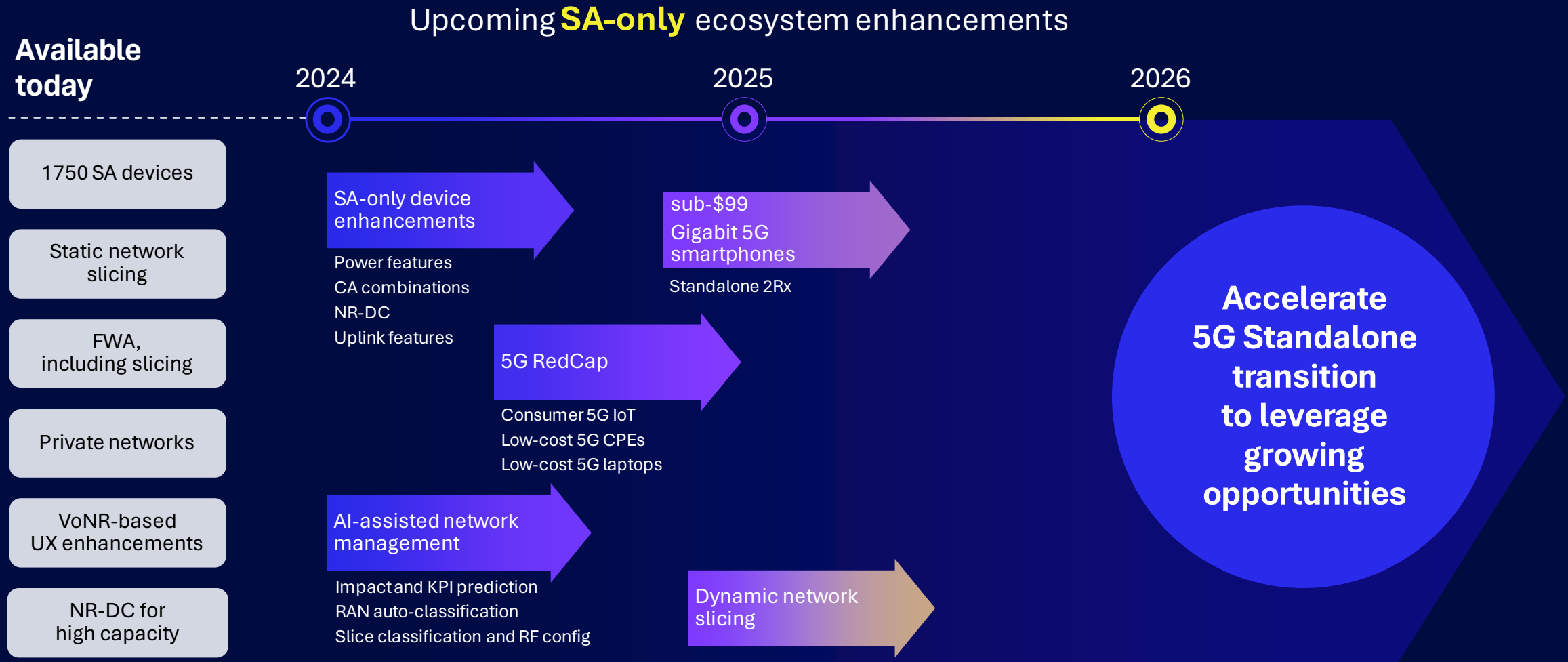
Deutsche T (public)
Elisa
Optus
Telenor Denmark
Zain Bahrain
Zain Kuwait

Trialing

Airtel
HKT
Movistar Colombia
Ooredoo Kuwait
Orange Belgium
Orange France
Rakuten
TEF Spain
Telenor Norway

Why NOW?

Transition to 5G SA unlocks growth opportunities

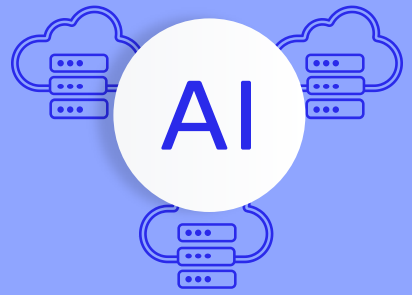


AI to define next-gen capabilities in 5G Advanced

AI/ML to pervade 5G Advanced networks and devices

Central Cloud

Qualcomm®
Cloud AI 100

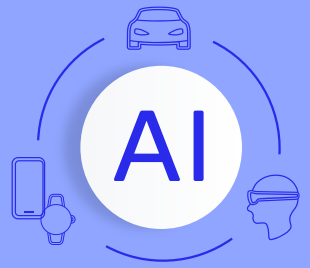


Edge cloud

Qualcomm®
5G RAN Platforms

Qualcomm®
Infrastructure Processors

Qualcomm
Edgewise™ Suite



On-device

Snapdragon®
X80 5G Modem-RF System

Snapdragon®
8 Gen 3 Mobile Platform

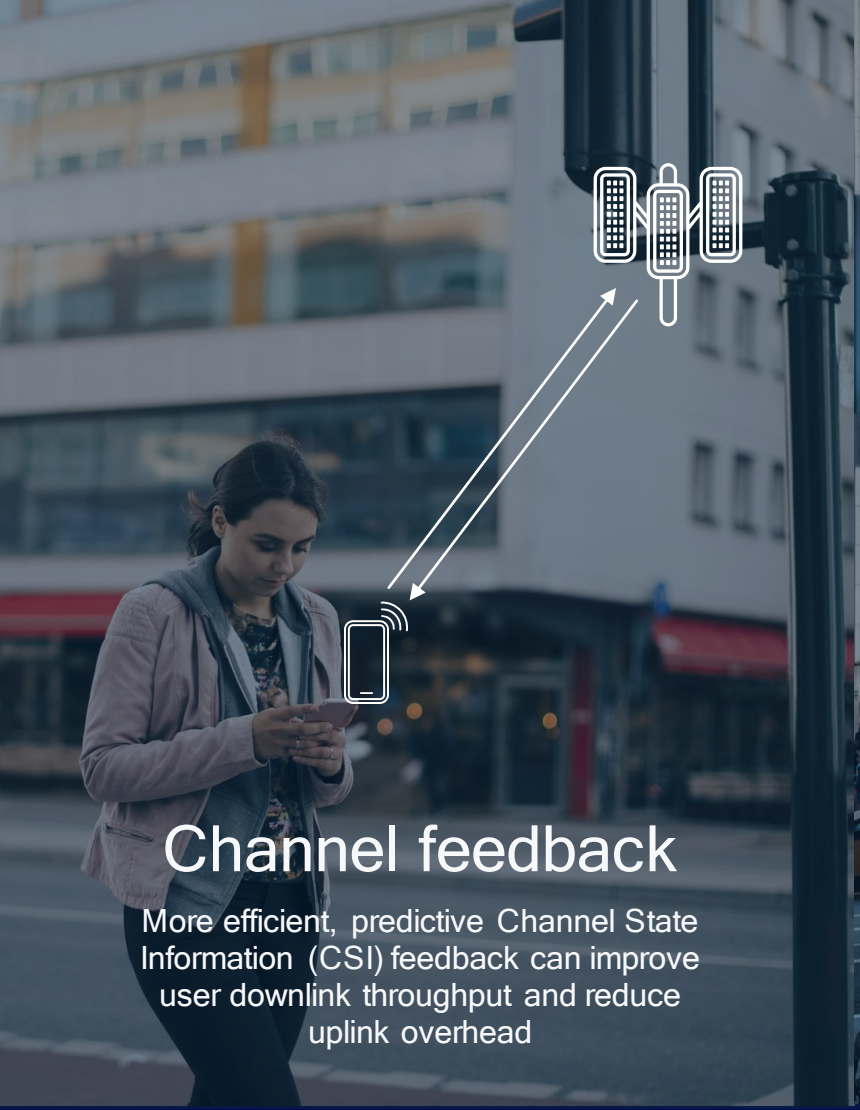
Qualcomm®
RB5 Robotics Platform

AI-enhanced 5G

Signal intelligence, baseband and medium access

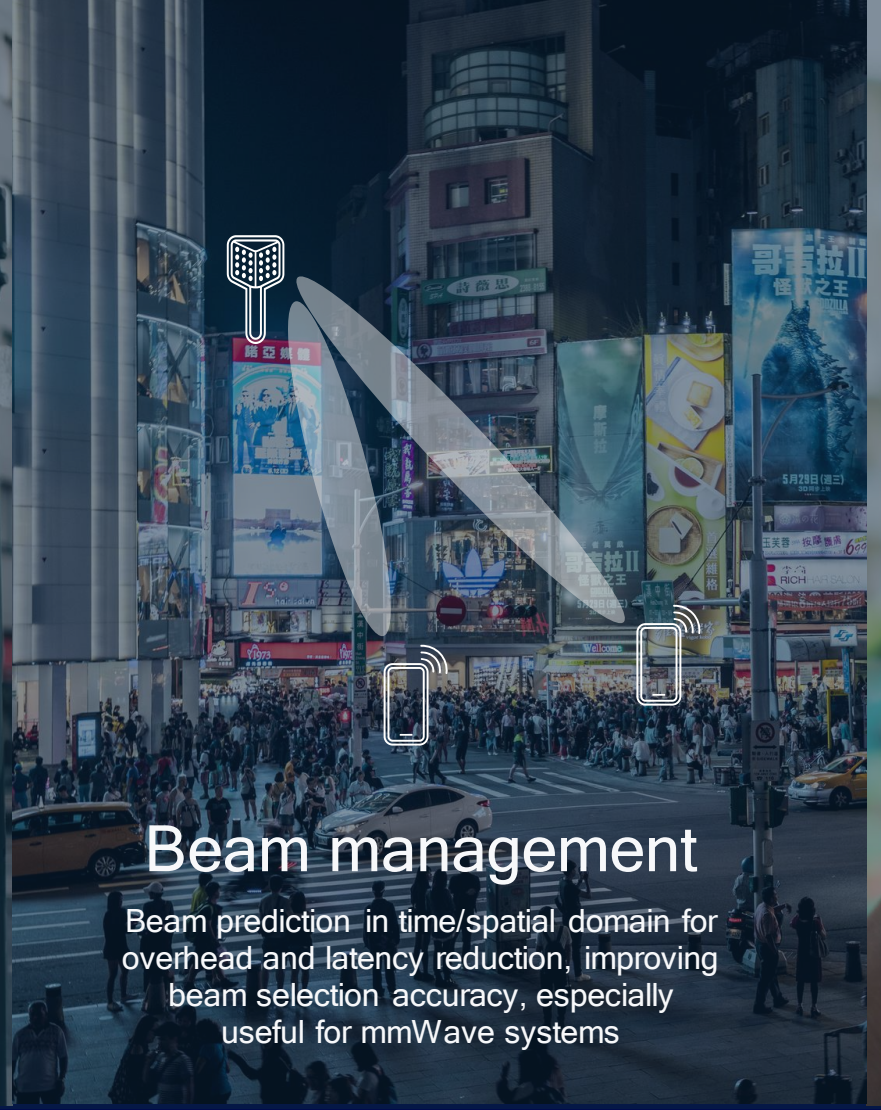
Network intelligence and system optimization

Device intelligence and optimization



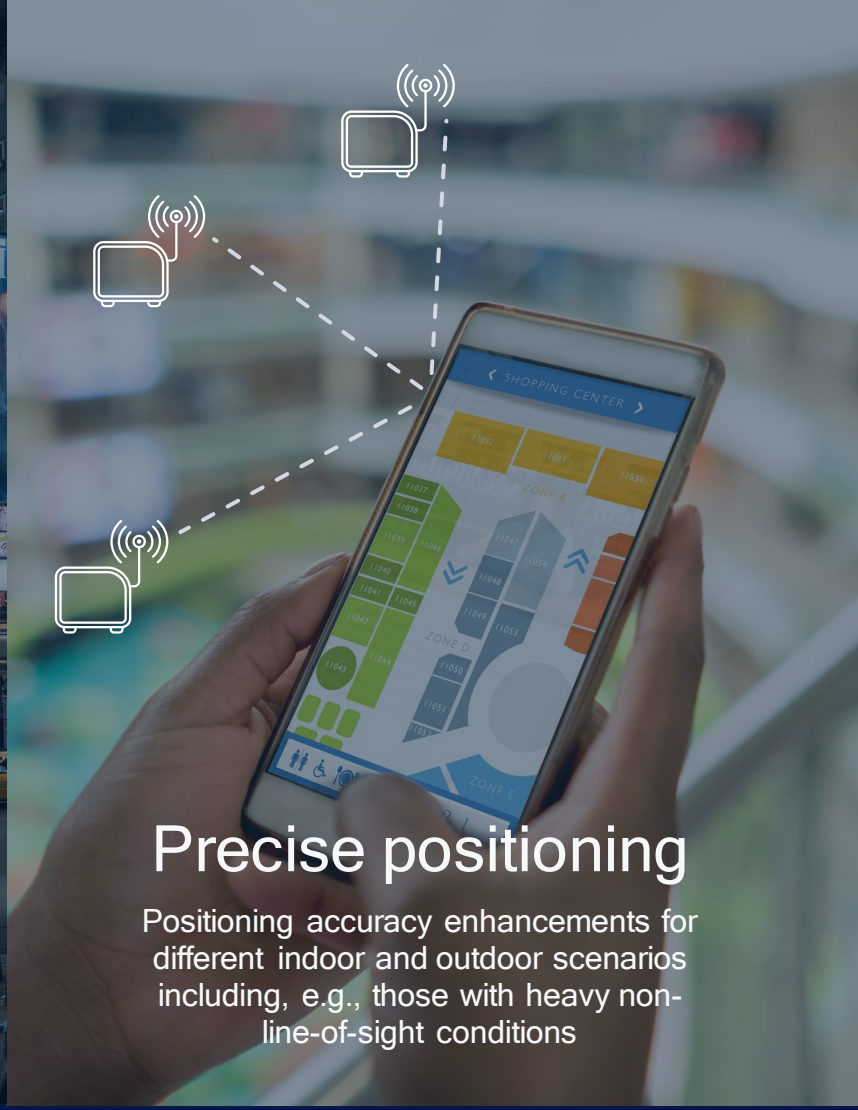
Channel feedback

More efficient, predictive Channel State Information (CSI) feedback can improve user downlink throughput and reduce uplink overhead



Beam management

Beam prediction in time/spatial domain for overhead and latency reduction, improving beam selection accuracy, especially useful for mmWave systems



Precise positioning

Positioning accuracy enhancements for different indoor and outdoor scenarios including, e.g., those with heavy non-line-of-sight conditions

AI/ML enhancements key in 5G Advanced

Improved device and network performance

5G RedCap ushering mass-tier 5G and premium consumer wearables

World's first

5G RedCap

Modem-RF system

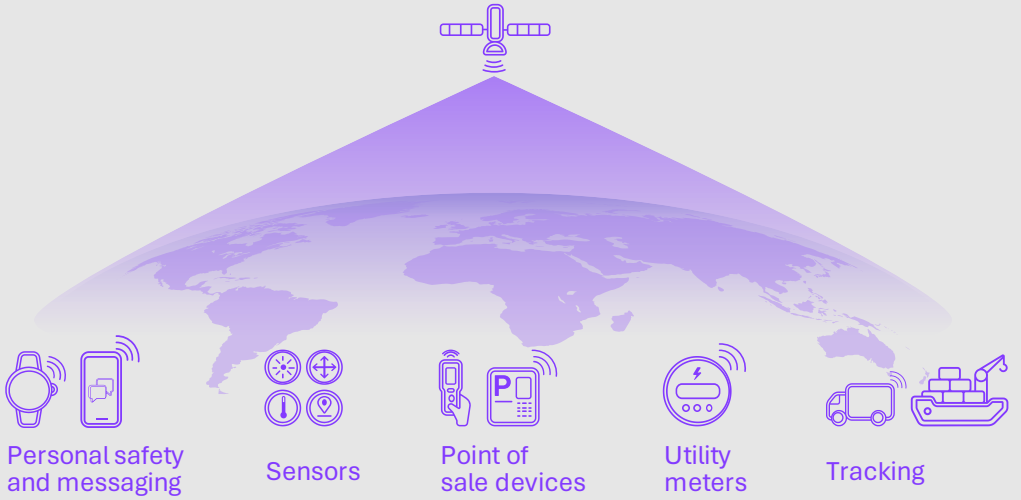
Snapdragon
X35 5G modem-RF

5G Non-Terrestrial Networks

5G NTN

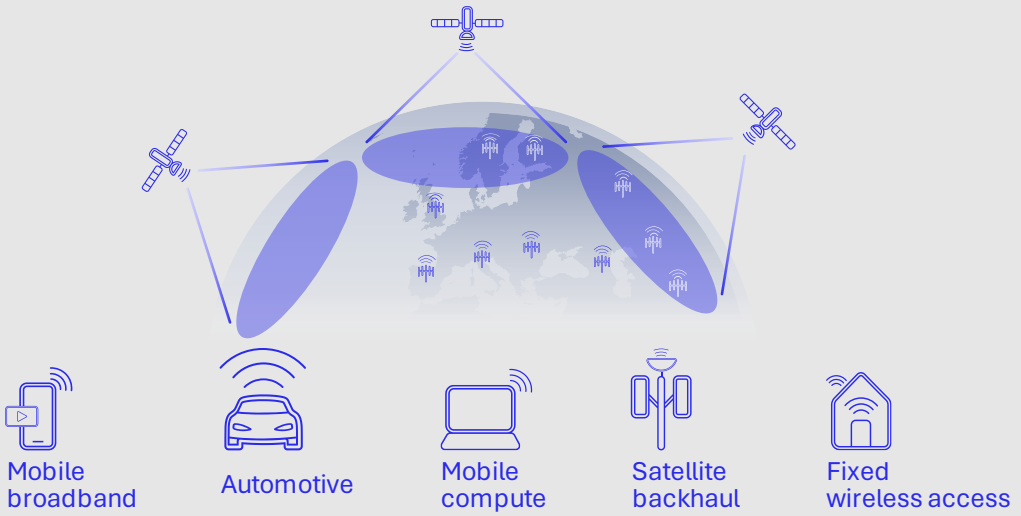
5G NB-NTN

Narrowband satellite communications for mobile and beyond



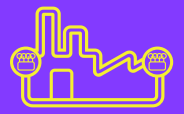
5G NR-NTN

Complementing terrestrial networks in underserved areas



5G Advanced
commercialization vectors in 2024-27

AI / ML
enhancements for devices and networks



RedCap
for IoT and fixed wireless access

Performance
enhancements for devices and networks

Satellite
mobile communications (NR-NTN)

Snapdragon X80 5G Modem-RF

5G Advanced-ready

Integrated 5G AI processor

World's first integrated NB-NTN support

Snapdragon X35 5G modem-RF

World's first 5G RedCap modem-RF system

Thank you

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Panel discussion

Moderator:
Barbara Pareglio
Technical Director
GSMA

Mahmoud Sherif
VP, Head of Innovation and Technico-Business Development
du

John Gao
President of 5.5G Domain
Huawei

Fran Heeran
Senior Vice President, Products & Engineering Cloud & Network Services
Nokia

Michael Zirkle
VP, Commercialization of 5G/MEC
Verizon

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Up next

Moderator:
Mark Cornall
Technical Director
GSMA

Session 3: Revolutionising operator services with Edge Compute and Private Networks

12:00 – 13:00