OPENRAN AND PARALLEL WIRELESS

All G World

Technology Mix

2025

2018

5G

4G 59%
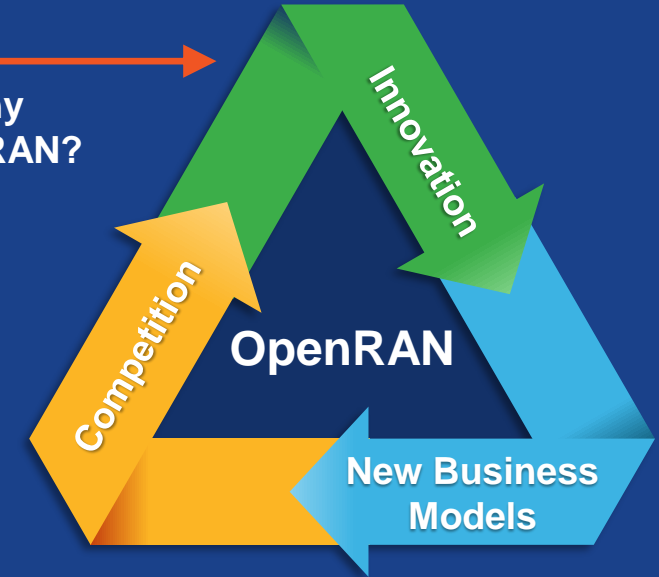
3G

2G

15% 5%

20%

43%

29%

28%
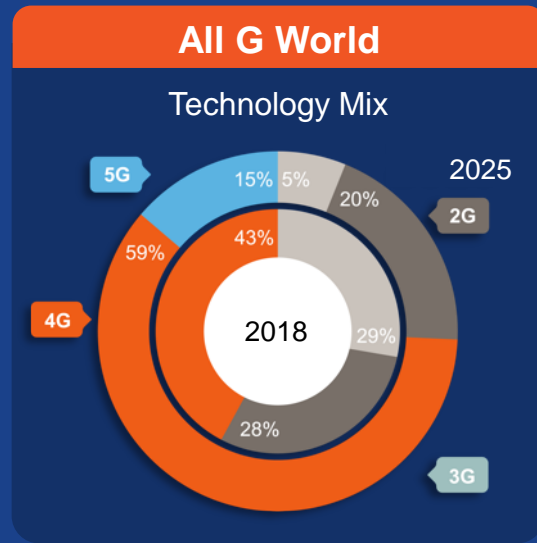
Deployment Challenges

Vodafone

"Traditional Solutions Not for Many Business Use Cases

- *Define and build flexible RAN solutions: software-defined, general purpose hardware*
- *Accelerate path to commercial deployments 2G/3G/4G technologies to bring more people online"*

Why OpenRAN?

Innovation

Competition

OpenRAN

New Business Models

Why PW

5G 4G 3G 2G OpenRAN // 5G Core and Edge // Analytics and Network Intelligence

OPEN   UNIFIED   CLOUD-NATIVE   SECURED   TRUSTED

- No Vendor Lock-In
- Cloud-Native 5G 4G 3G 2G
- Easy to Deploy, Manage & Upgrade

- Coverage and Capacity
- Deployed on 6 Continents

BT   ESN   5G RuralFirst

OptimERA Inc

INLAND CELLULAR

vodafone

zain

Cellcom

Telefónica

Tier 1

MTN

OPTUS

ıllParallel WIRELESS
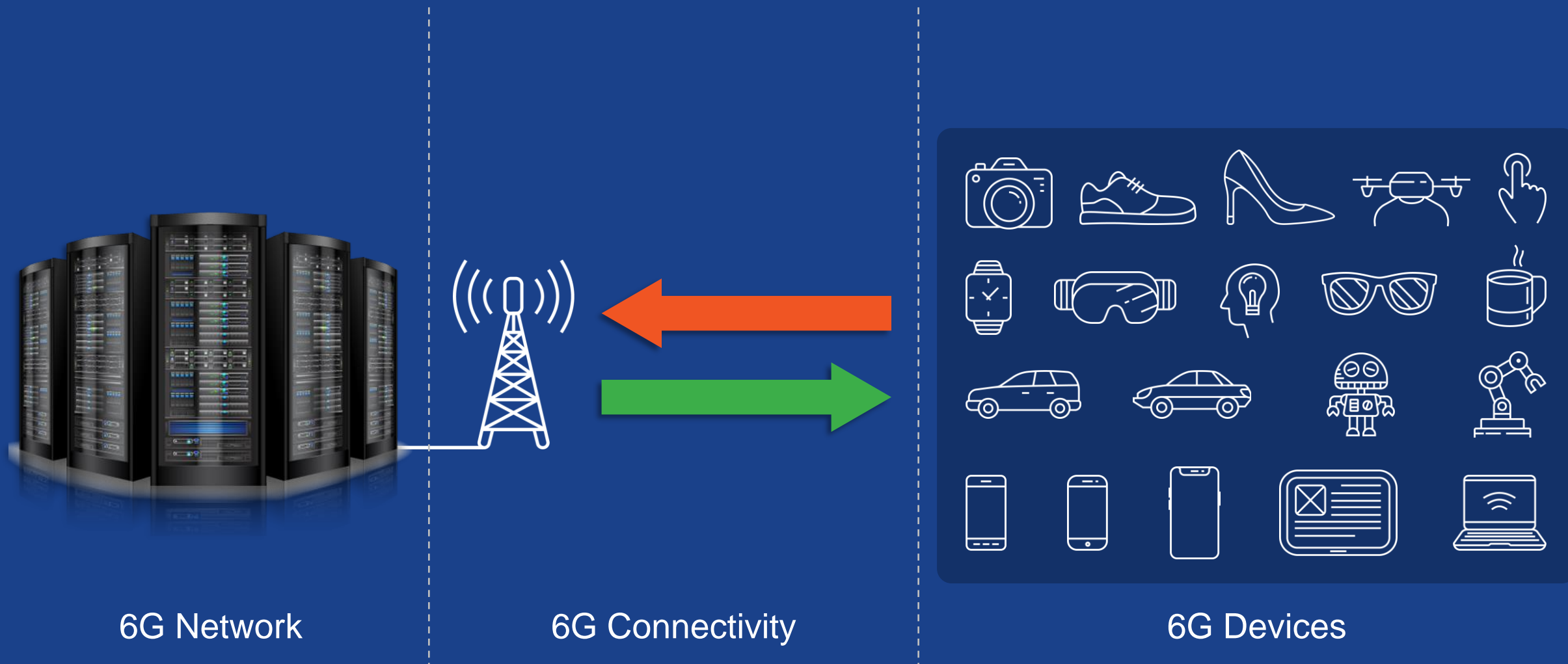
PRESENTED BY ZAHID GHADIALY

Senior Director at Parallel Wireless and Principal Analyst & Consultant at 3G4G

Zahid is a technologist with a deep understanding of architecting world-class mobile products and solutions. With over 20 years of experience in telecom industry as an engineer, programmer, analyst, researcher, architect, trainer, product manager and technical marketer, he has witnessed the highs and lows of this industry. He is a skeptic and often challenges conventional wisdom. He was a part of the team responsible for the first 3G network rollout in Japan and Europe. Since then he has worked extensively in mobile technologies like 3G, 4G and now 5G. He is also widely recognized as an evangelist for new technologies, often talking about them in various industry fora, conferences and blogs; separating the hype from the real-world applications & services.

Parallel Wireless - https://www.parallelwireless.com/

3G4G - https://www.3g4g.co.uk/

Parallel WIRELESS

6G Network   6G Connectivity   6G Devices

Network &
Architecture Evolution

Access Network
Evolution

Devices and
Components Evolution

6G Network

6G Connectivity

6G Devices

QUALCOMM'S VISION: ONE XR DEVICE TO RULE THEM ALL!

Convergence: one device to rule them all.

At some point in the future, we envision the convergence of the smartphone, mobile VR headset, and AR glasses into a single XR wearable. XR could replace all the other screens in your life, like that big TV in your living room. Mobile XR has the potential to become one of the world's most ubiquitous and disruptive computing platforms—similar to the smartphone today.

Learn more about our XR vision

Source: Qualcomm

AUGMENTED REALITY (AR)

In Augmented Reality (AR), virtual information and objects are overlaid on the real world. This experience enhances the real world with digital images, text, and animation.

LG U+ AR Dance-Off

VIRTUAL REALITY (VR)

In a Virtual Reality (VR) experience, users are fully immersed in a simulated digital environment. Users must put on a VR headset or head-mounted display (HMD) to get a 360 - degree view of an artificial world

NTT Docomo VR Example
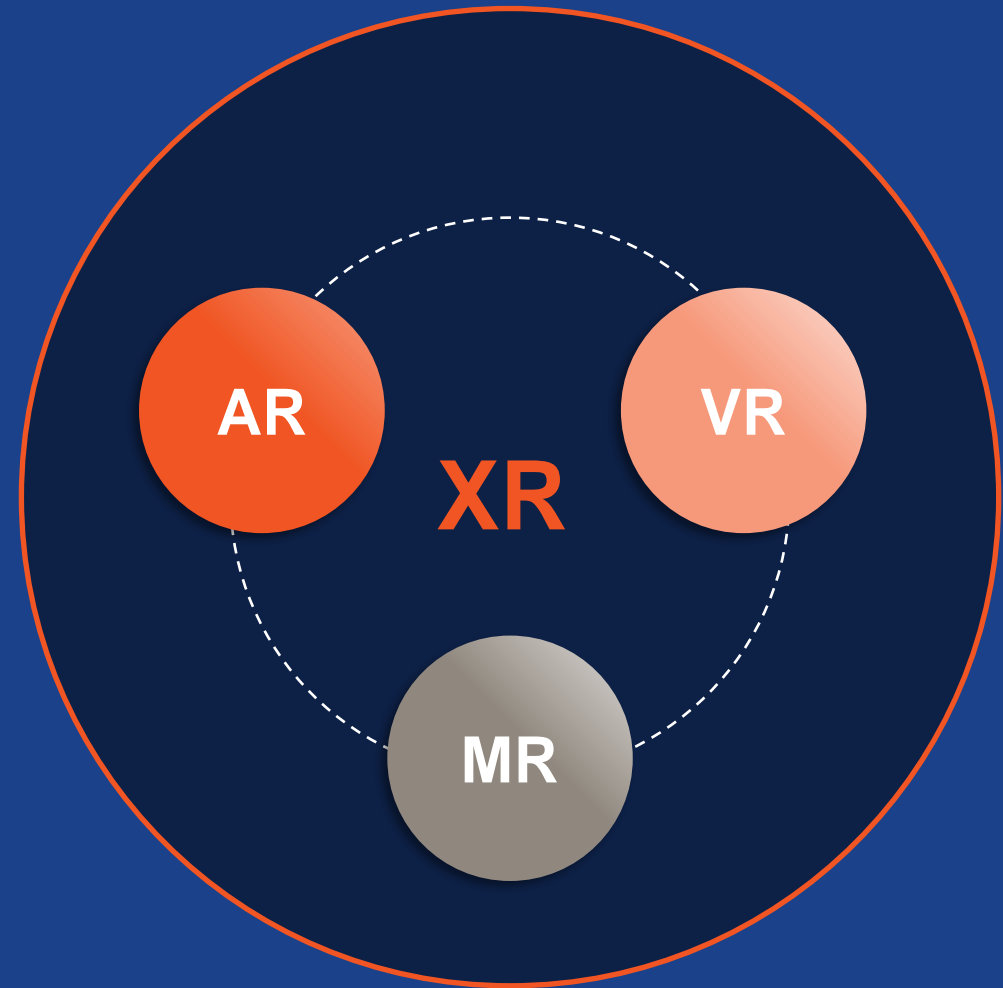
MIXED REALITY (MR)

In Mixed Reality (MR), digital and real-world objects co-exist and can interact with one another in real-time. This is the latest immersive technology and is sometimes referred to as hybrid reality.

Microsoft HoloLens MR Example

EXTENDED REALITY (XR)?

Extended Reality (XR) is an umbrella term for all the immersive technologies.

AR

VR

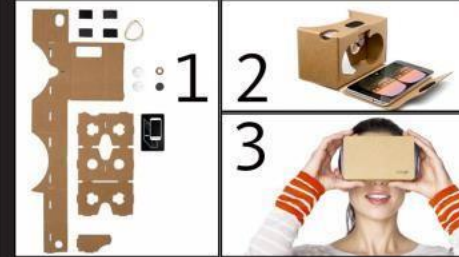**XR**

MR

VIRTUAL REALITY HEAD MOUNTED DEVICES

OCULUS
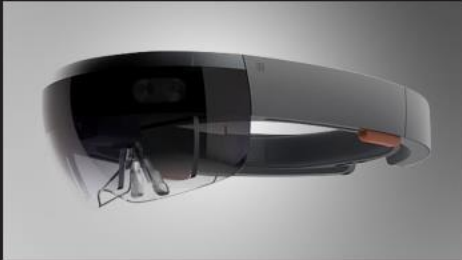
HTC VIVE

SAMSUNG GEAR

GOOGLE
CARDBOARD

POWIS
CARDBOARD

AUGMENTED REALITY HEAD MOUNTED DEVICES

MICROSOFT
HOLOLENS

MAGIC LEAP

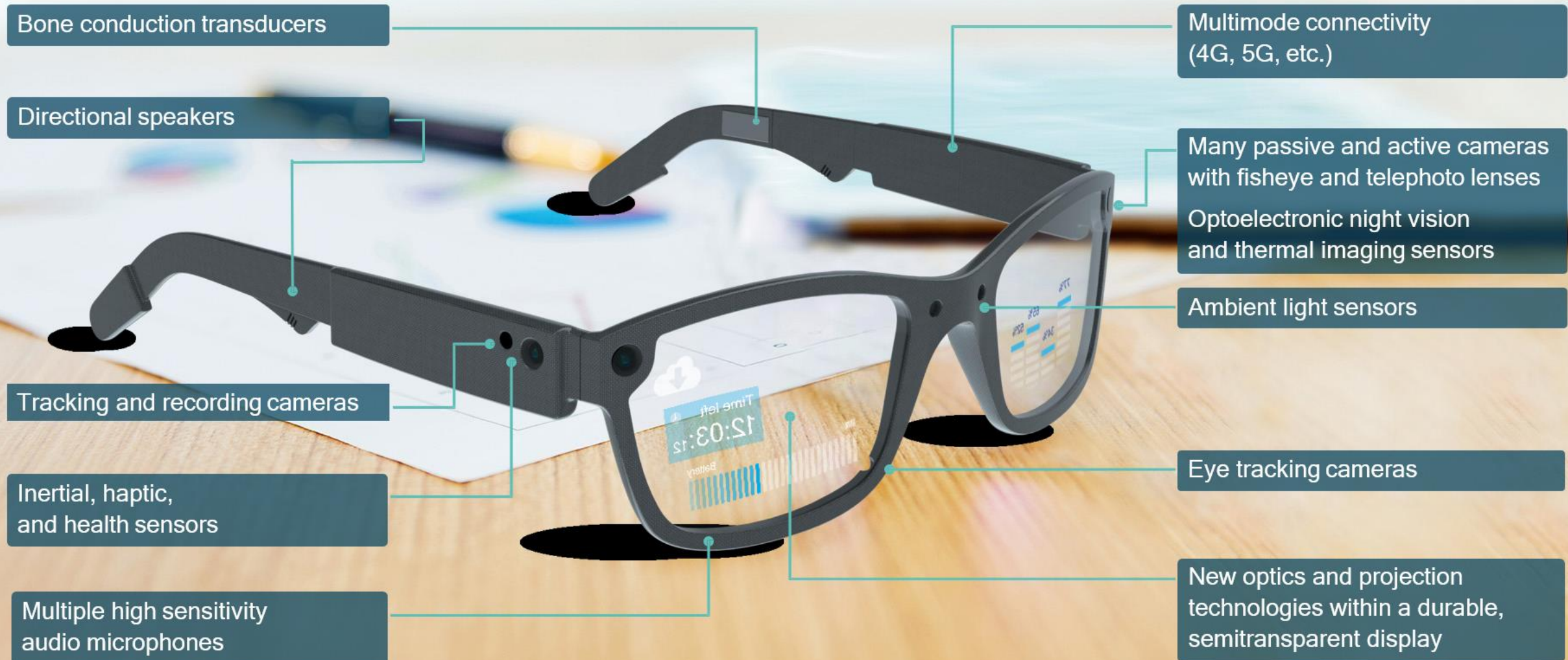MIRA PRISM

Gensler

NREAL MIXED REALITY GLASSES KIT

Source: Nreal

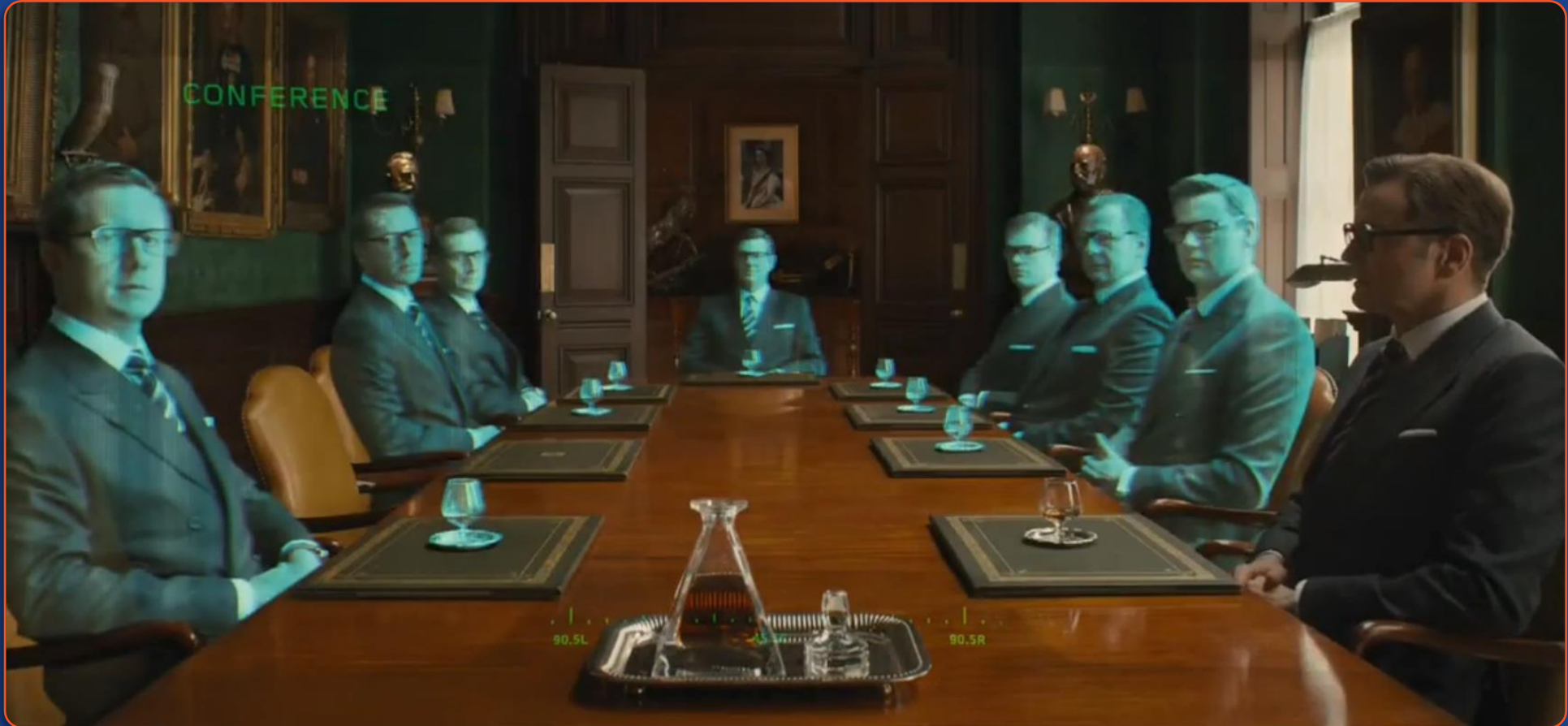# COLLABORATION OVER IMMERSIVE XR

Source: Qualcomm

A glimpse into the future — everyday AR glasses

Bone conduction transducers

Directional speakers

Tracking and recording cameras

Inertial, haptic, and health sensors

Multiple high sensitivity audio microphones

Multimode connectivity (4G, 5G, etc.)

Many passive and active cameras with fisheye and telephoto lenses

Optoelectronic night vision and thermal imaging sensors

Ambient light sensors

Eye tracking cameras

New optics and projection technologies within a durable, semitransparent display
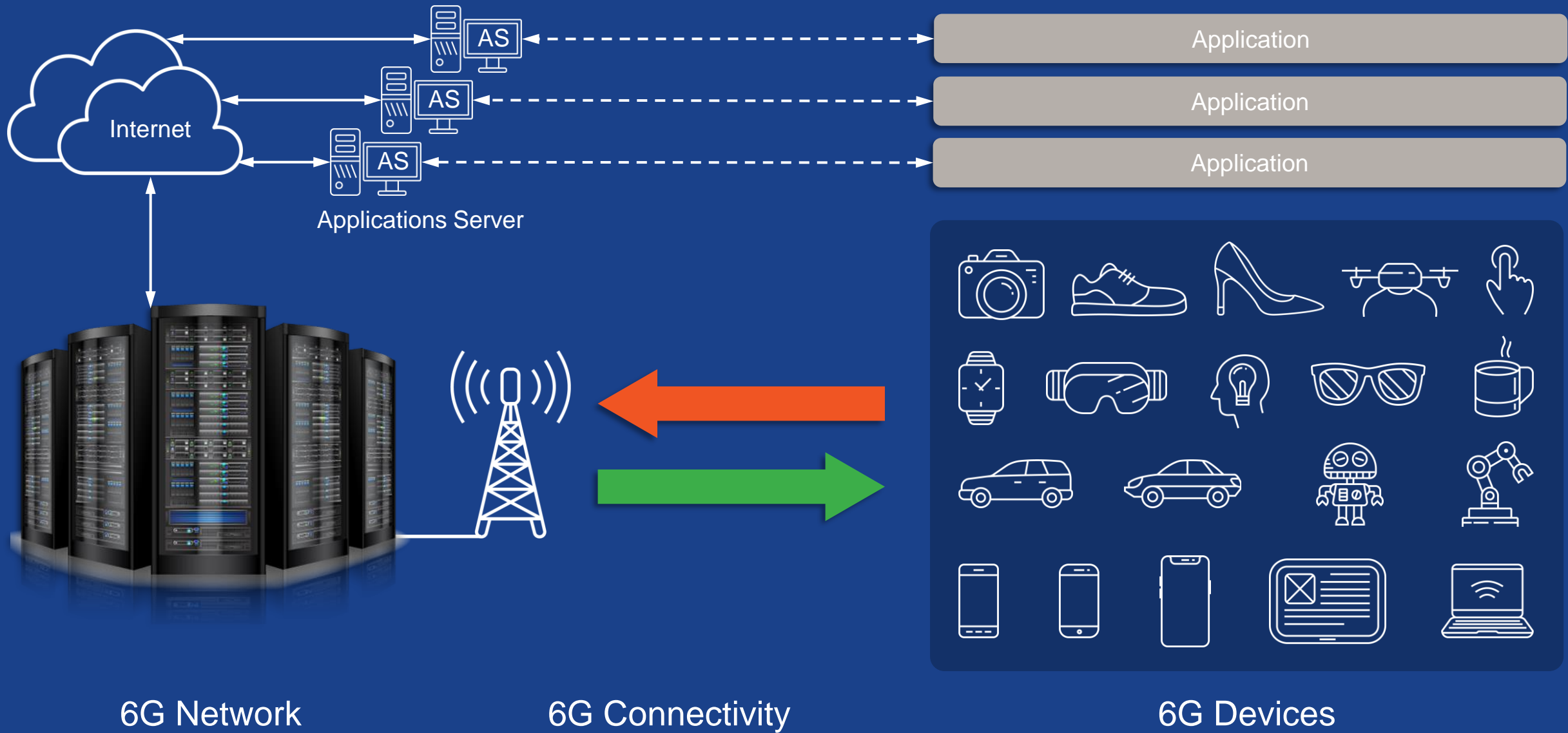
Source: Qualcomm

OUTSTANDING CHALLENGES WITH XR EVOLUTION

- Virtual Objects look Fake

- Improvements needed in motion tracking
  - Improved head/body tracking
  - Improved eye tracking

- Poor Battery Life

- Charging time

- Fast Switch-on

- Able to handle large amount of computation, without getting hot

- High speed connectivity, indoors and outdoors

- Low latency (zero lag)

- Weight

- High Cost

HOLOPORTATION/'HOLOGRAPHIC TELEPRESENCE'

Holoportation example from movie Kingsman: The Secret Service (see video)

Application

Application

Application

Applications Server

Internet

6G Network   6G Connectivity   6G Devices

DEVICES/APPS NOT CLEVER ENOUGH – CAN AI HELP?

- Apps are unaware of what else is going on
  - If I am watching a video and a call comes, everything stops – it is acceptable
  - If I am on a WhatsApp/Viber call and a call comes, everything stops – it is nonacceptable
  - If I am on a Zoom/Teams call and a call comes, it interrupts everything.
  - Device, Native Apps and OTT Apps need to understand each other

- Devices need to understand normal conversations
  - If I ask to message someone, should know which App to use
  - Forward SMS to WhatsApp
  - Connecting info from one App to another

- Apps that want you to be active like YouTube, you can't just listen, you have to switch screen on too

- Apps that restrict you downloading video that you may have uploaded

FURTHER READING

- Parallel Wireless: Open RAN Hub ([link](#))
- The 3G4G Blog: 5G eXtended Reality (5G-XR) in 5G System (5GS) ([link](#))
- GSMA: The activities of GSMA on 5G and Cloud AR/VR ([link](#))
- Qualcomm: Extended Reality ([link](#))
- Virtual Reality Book by Steven M. LaValle ([link](#))
- Free 6G Training Blog ([link](#))
- 3G4G: 6G and Beyond-5G Wireless Technology ([link](#))