Path to metaverse ready networks and 6G

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Workshop: More than GigaBit Broadband & Metaverse on the Move

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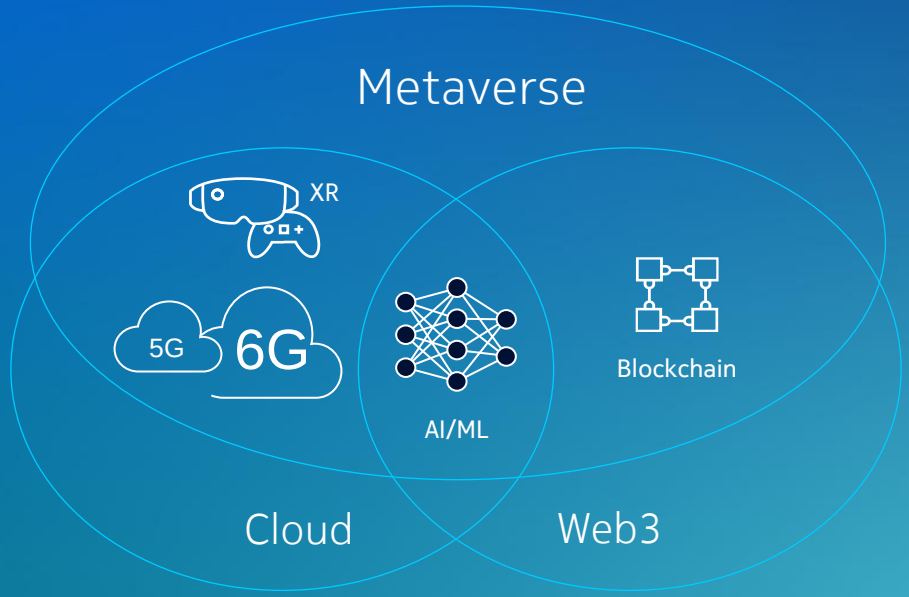
Key trends shaping the world of 2030

Driving requirements for the ecosystem and the network

Socio-economic & geopolitical

- Deglobalization
- State-driven innovation
- Cybersecurity
- Sustainability

Technology convergence



User needs

Industry-Enterprise-Consumer-Developer

- Evolved experiences
- Digital-first
- Service-optimized connectivity
- New purchasing priorities

We have a clear and definitive vision of the metaverse opportunities

Concepts of ‘Human Augmentation’ and ‘Digital-Physical Fusion’ frame this vision

~ today

~ 2030

Metaverse enablers

Human Augmentation

Handhelds
VR HMDs
Tethered AR glasses
Haptic-enabled remote control

Connected bio-medical implants
Industrial exoskeletons
Ergonomic, untethered XR glasses
XR interoperability

Digital-Physical Fusion

Basic, organization-level digital twins
Smart sensor networks
Persistent virtual worlds & objects

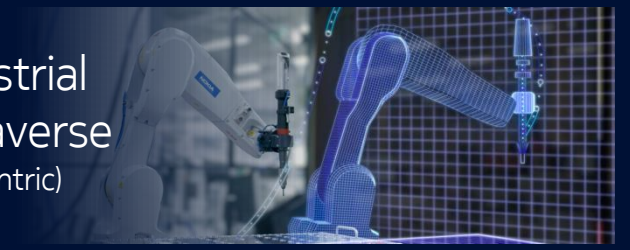
Complex, enterprise-wide digital twins
Ecosystem interoperability
Interactive 3D digital twins
6G network sensing

Metaverse opportunities

Consumer Metaverse

Enterprise Metaverse
(IT-centric)

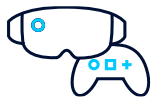
Industrial Metaverse
(OT-centric)



* Virtual Reality Head-Mounted Displays
** Augmented Reality
*** Extended Reality

Mobile Networks focus areas in 5G-Advanced

Boosted 5G experience



XR traffic, latency and mobility

Beamforming boost and Distributed mMIMO for UL performance

Boosted 5G operability

AI/ML enhancements

Radio Energy efficiency

Boosted 5G services usage

IoT optimized RedCap support

UAV (Uncrewed Aerial Vehicle

Space-Air-Ground Networks

= Planned leader role (rapporteur) in 3GPP Rel 18 work

What to expect from 6G networks

These are also the challenges we will overcome to bring 6G to life

Critical dimensions

Capacity and throughput

- 20x traffic growth
- 100 Gbps peak data rates
- 1 Gbps where needed

Reliability and latency

- 0.1 ms-1ms
- Nine 9s (99.9999999%)
- Nanosecond synchronization level

Scale and flexibility

- Global coverage
- 10 million devices/Sq Km
- Platform & services approach

** Extreme attributes of performance may apply to specialized sub-networks only and all the requirements may not be achieved simultaneously*

6G Value drivers

Sustainability

- Zero-carbon-footprint networks and 6G for a sustainable future

Digital inclusion

- Global connectivity will be a basic human right

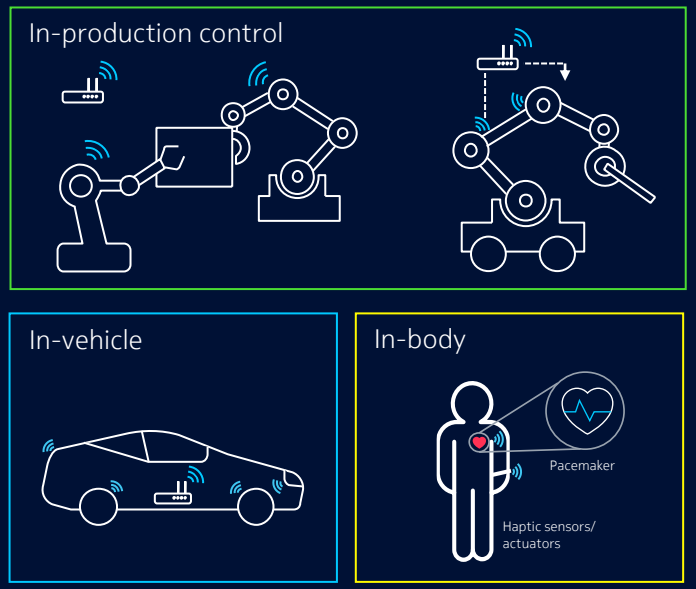
Security and privacy

- Evolve networks towards fully trustworthy and resilient systems

Network Building

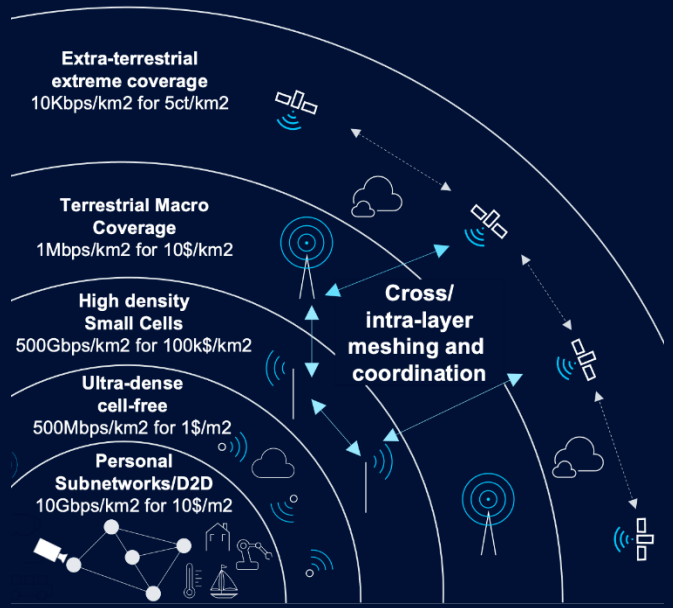
Network transformation requires new ways of building and integrating networks

Extreme performance specialized networks



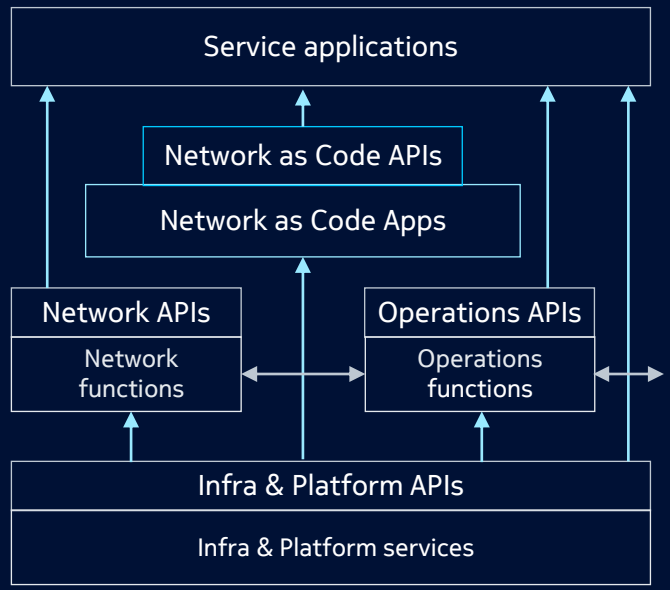
Highly engineered localized solutions for achieving mission-critical performance

Network of Networks



A hierarchy of collaborative network layers providing enhanced ubiquity and local capacity

Network-as-a-Service enrichment

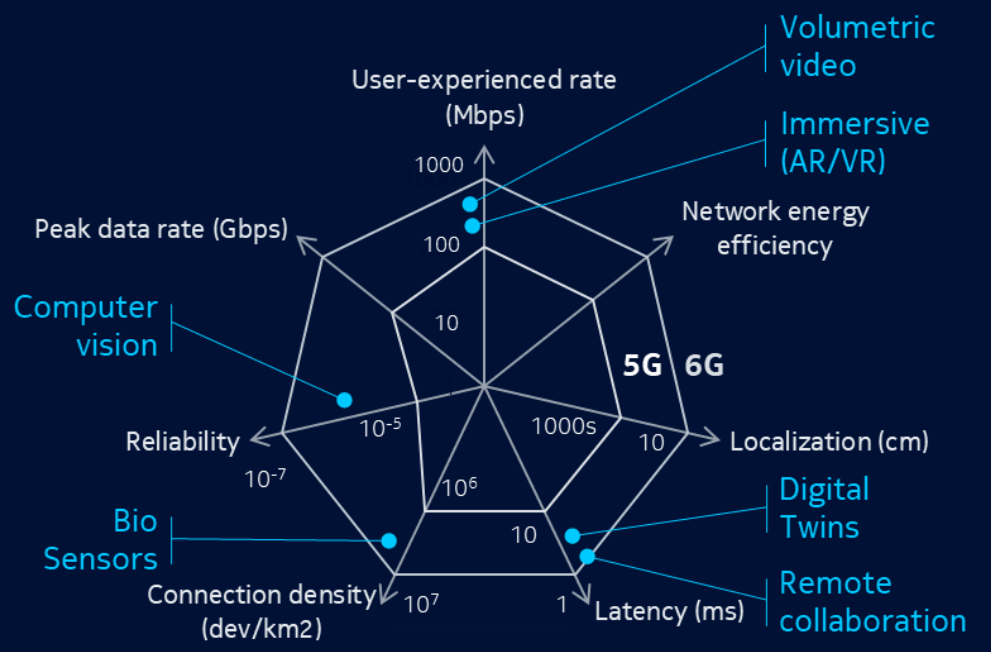


Enriching NaaS value via consumable, intent-based Network as Code APIs and AI/ML-based orchestration

The network will be key to realizing these opportunities

… requiring transformed capabilities and versatile integration

New service needs



New network capabilities


NOKIA