5G for people and things

Key to the programmable world

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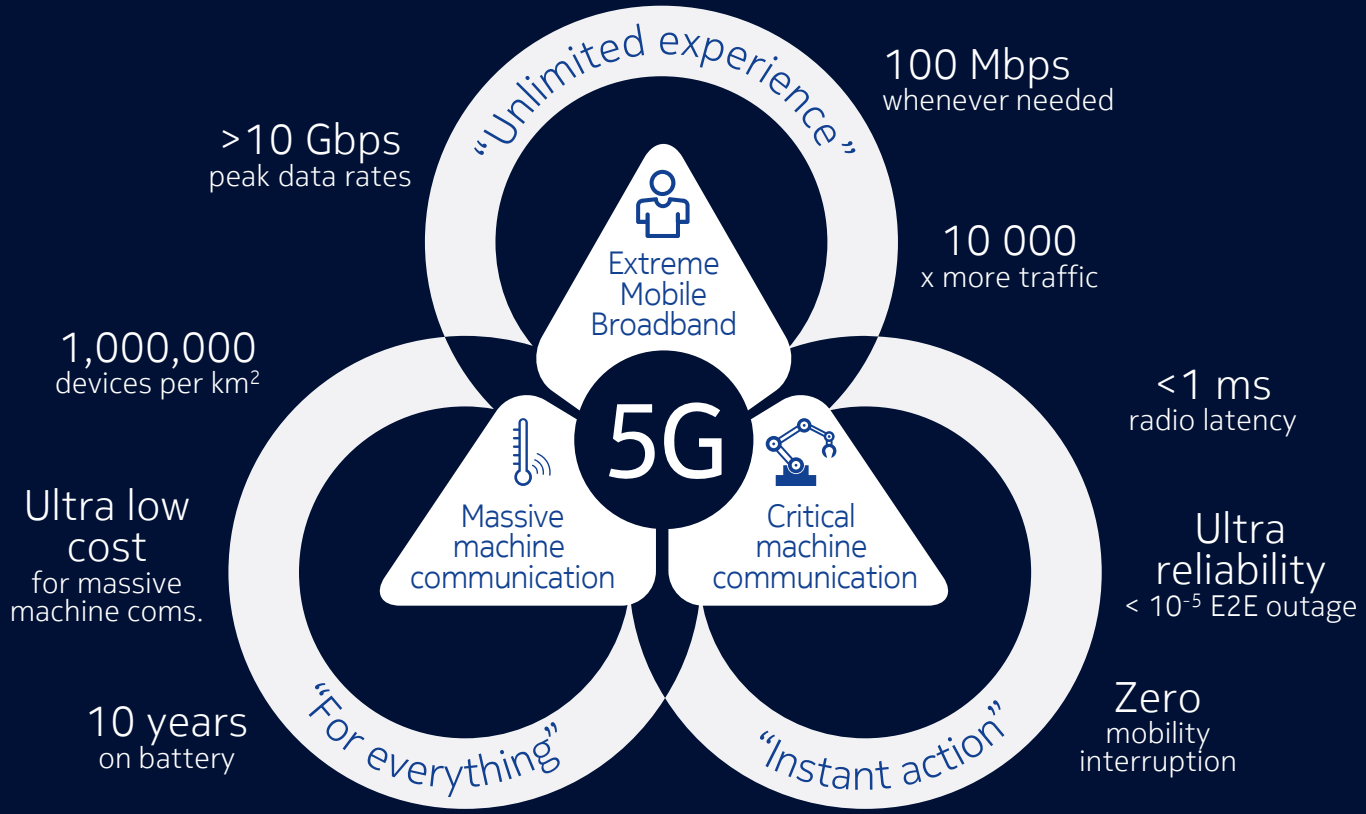
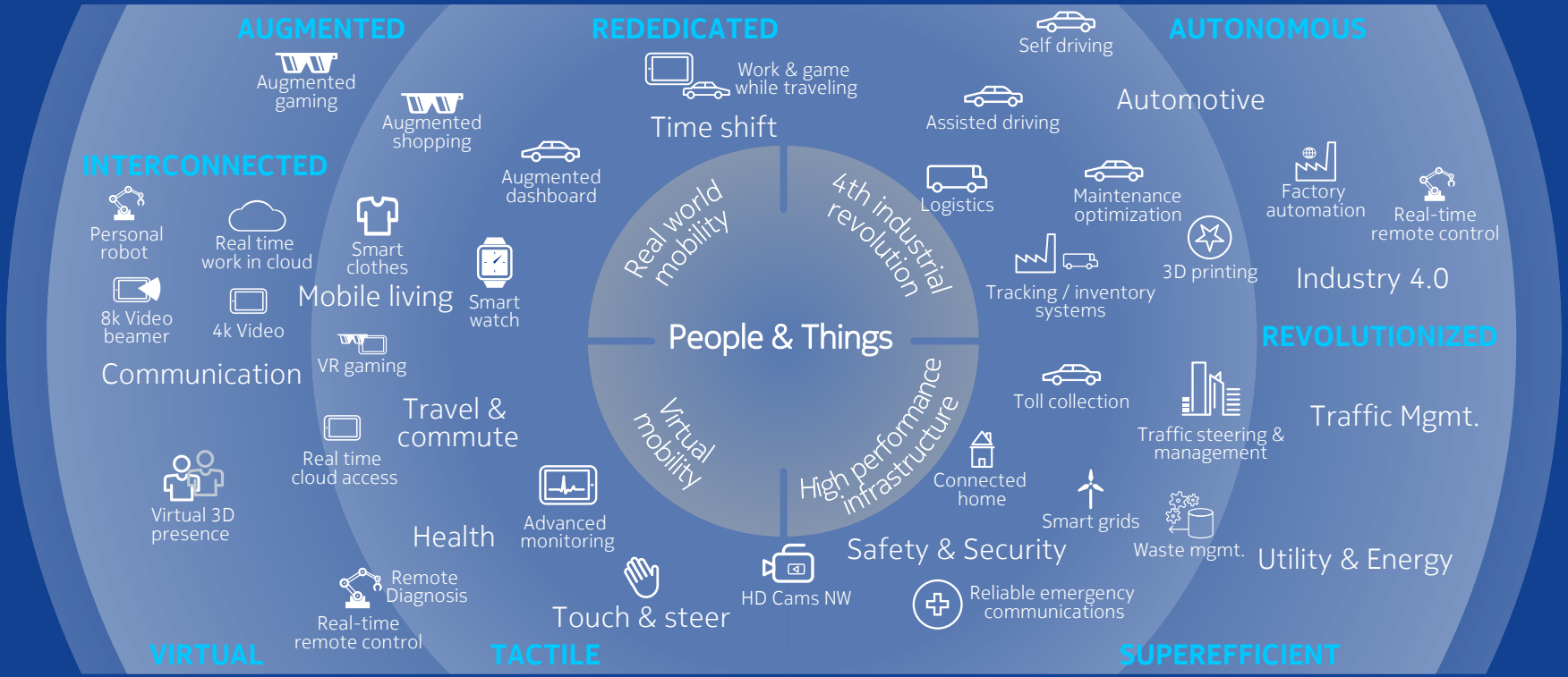
5G will change the world

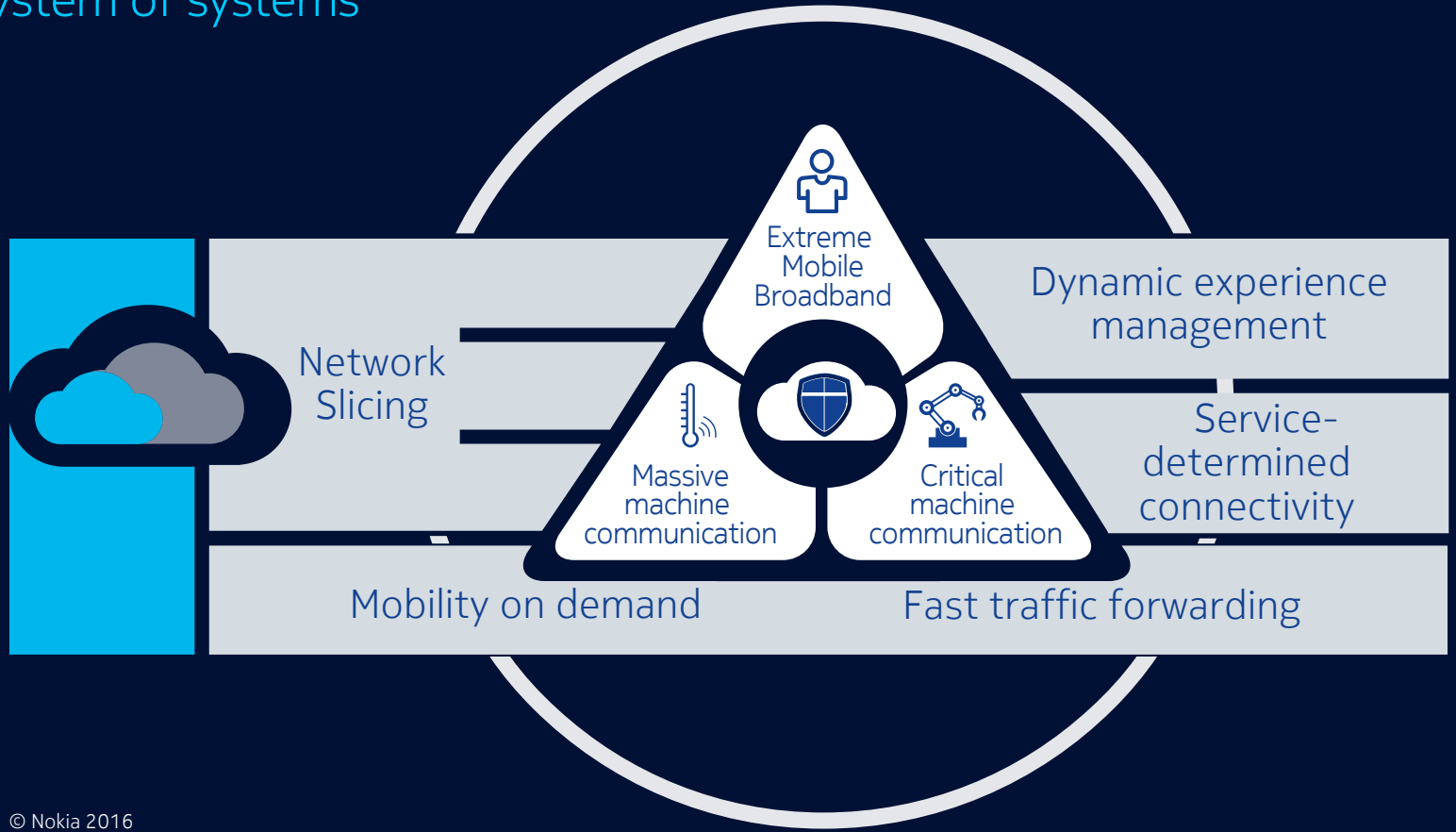


Explosion of possibilities: new performance levels of people and things



5G for people and things | Key to the programmable world

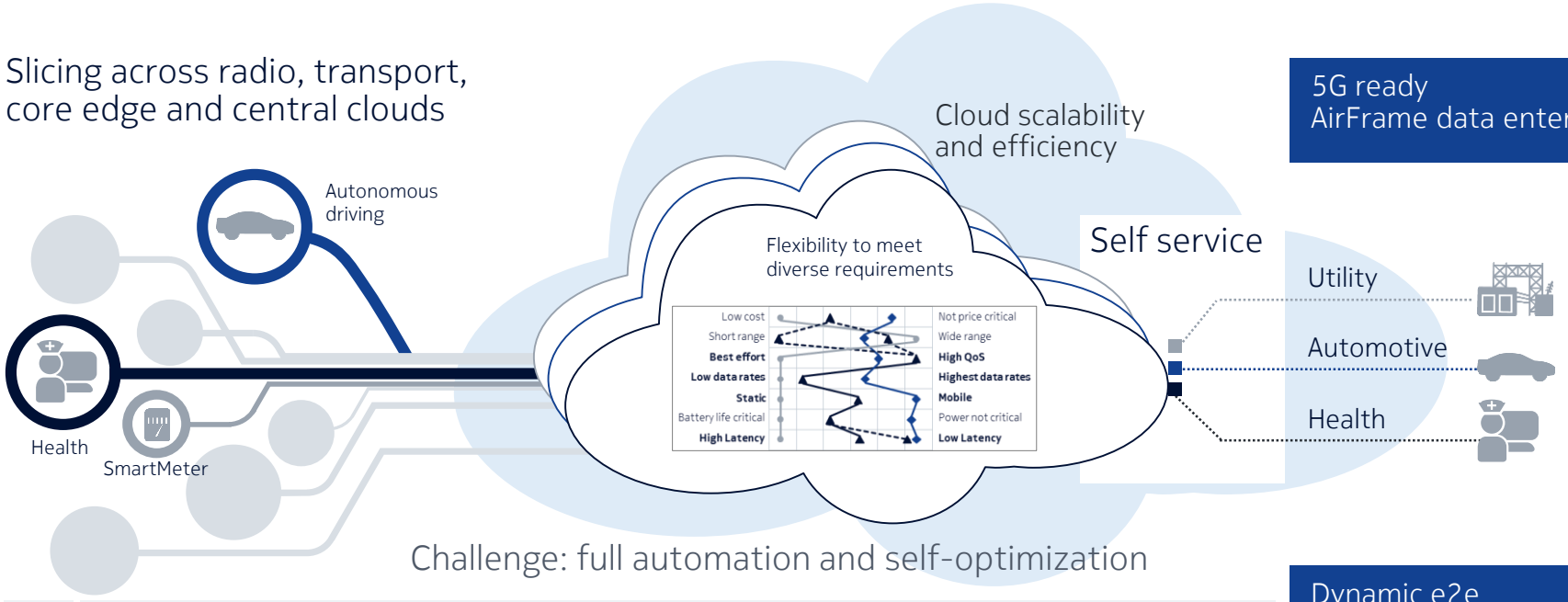
System of systems



Network Slicing | Optimized service delivery for heterogeneous use cases

Multiple independent instances on one physical network

Slicing across radio, transport, core edge and central clouds



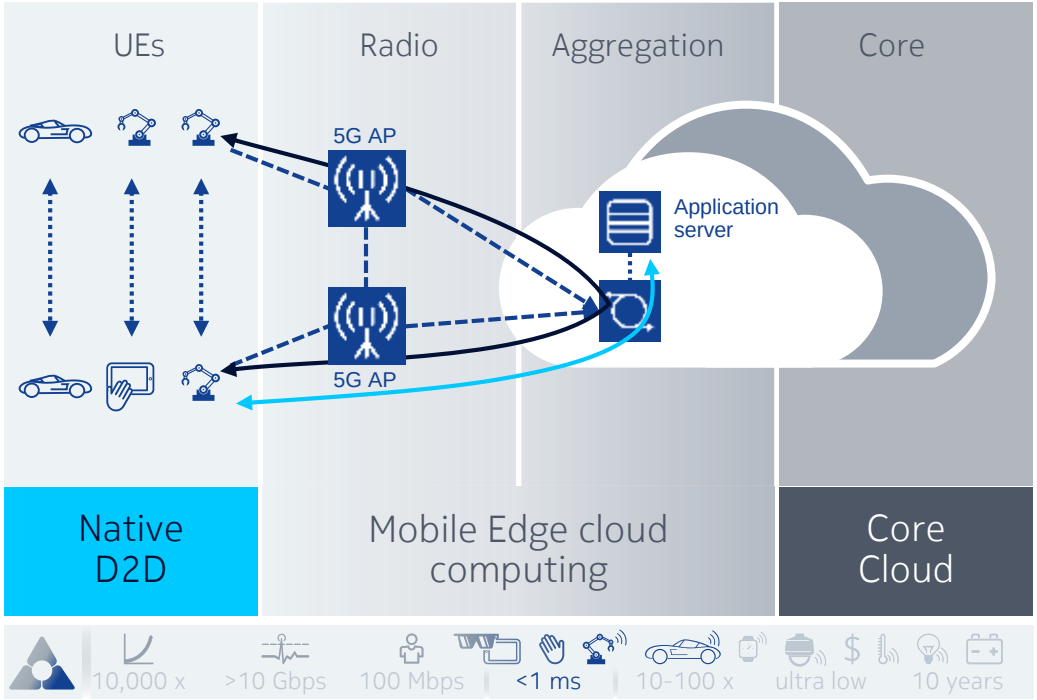
5G ready
AirFrame data enter

Dynamic e2e network slicing

*5G Novel Radio Multiservice adaptive network Architecture

Fast traffic forwarding | Enabling a new generation of latency critical services

Lowest latency packet forwarding to UEs



Moving
virtual networks

Mission-critical
services, e.g. in V2X or industrial applications

Central cloud based	> 50 ms latency
Mobile Edge LTE	≈ 10 ms
5G Edge	≈ 2,5 ms
5G D2D	≈ 1 ms

Vehicle2Infra trial
on German motorway

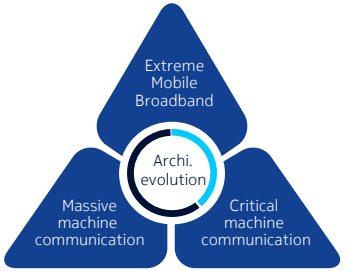
Pioneer in Mobile Edge Computing

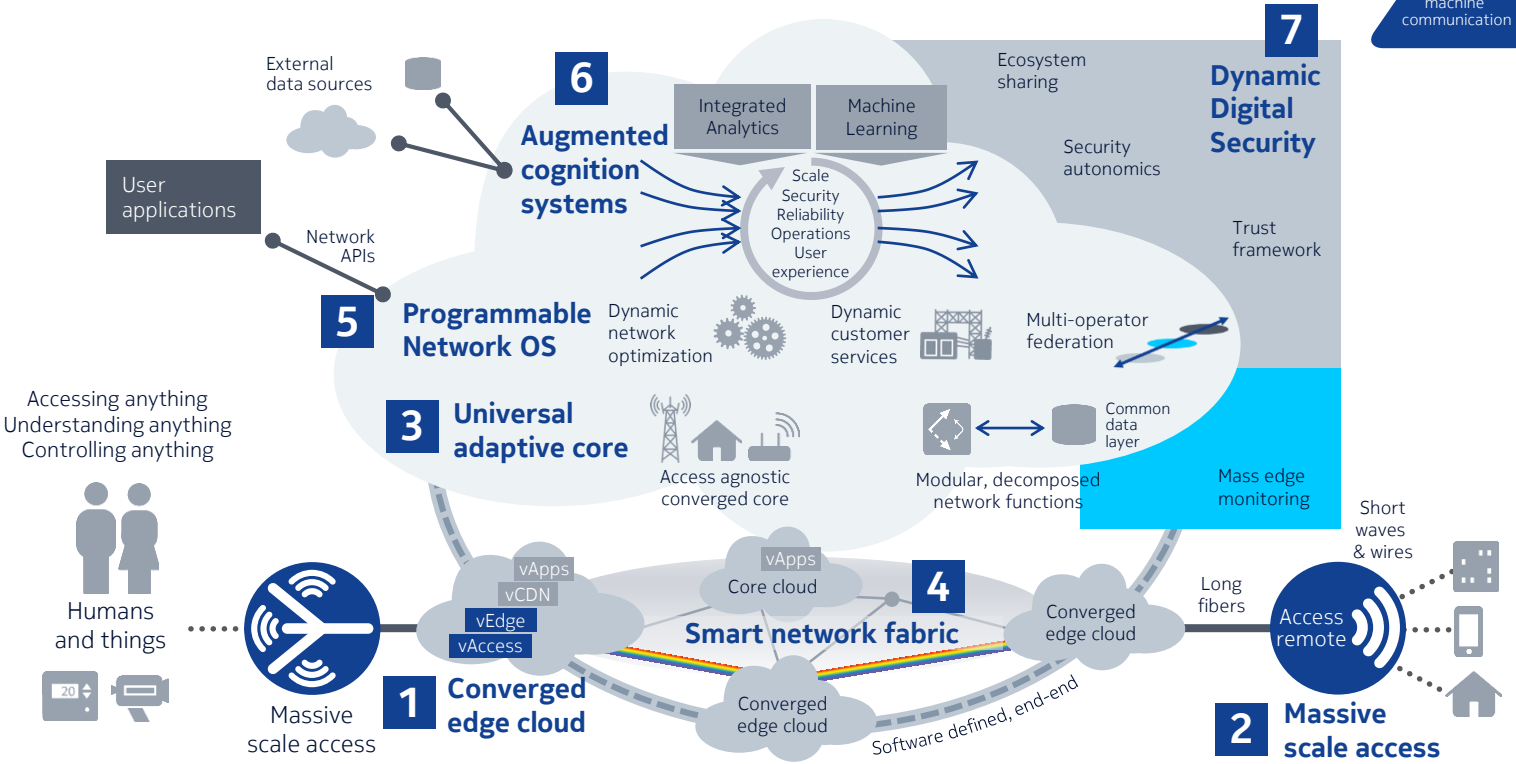
Autonomous driving live demo

ETSI ISG Chair

Fundamental Architecture evolution is required

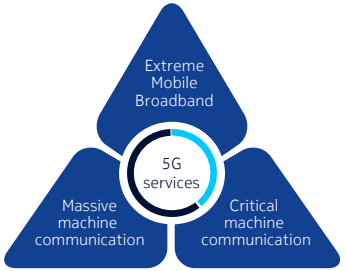
Cognitive + converged + cloud-optimized network evolution





Services transformation is a pre-requisite

E2E workflow automation, Cloud infra, Continuous delivery

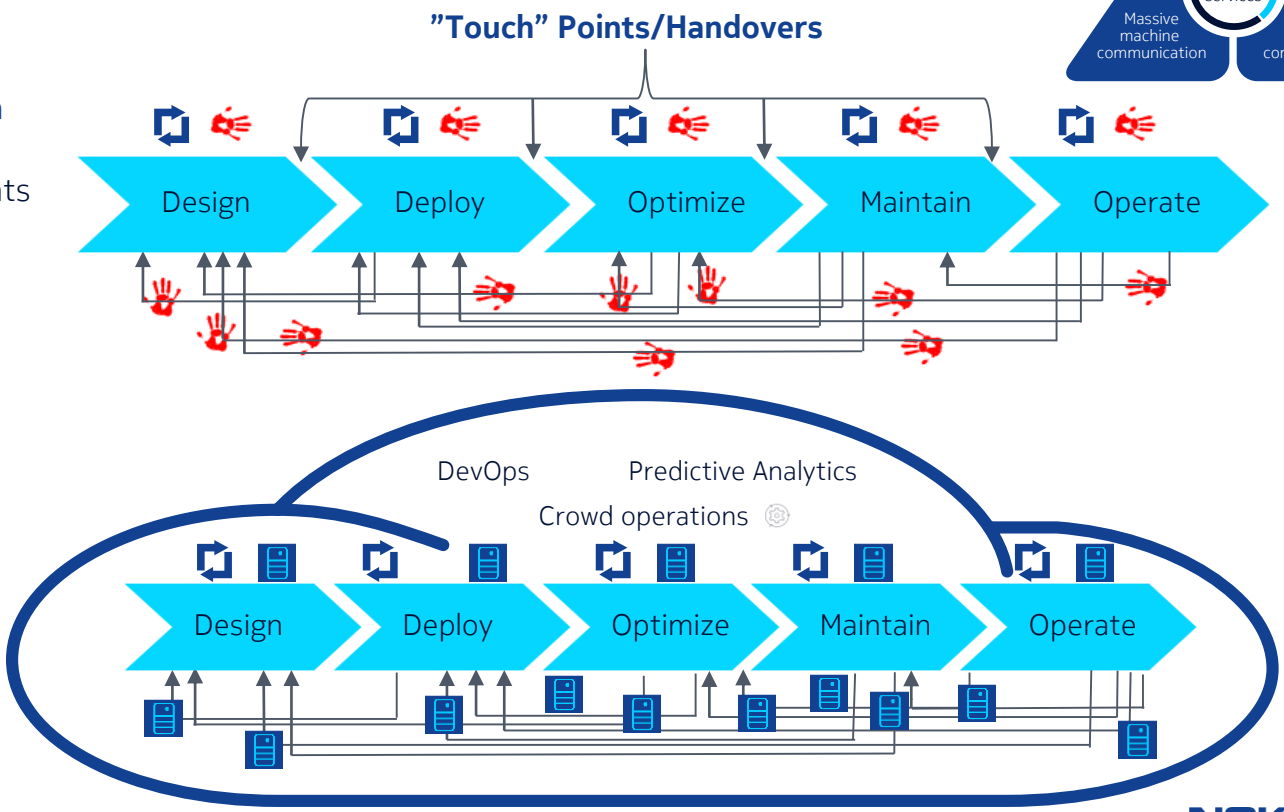


Present Mode of Operation

- Relaxed* lead times
- Handovers and touch points
- Slow ROI
- Technology driven

Future Mode of Operation

- Ultrashort lead times
- Seamless delivery
- Fast ROI
- Business driven



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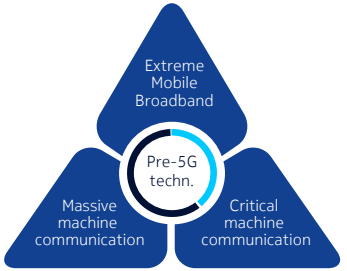
Maximize use of Pre-5G-technologies
Nokia's innovations enable Path to 5G now



Massive MIMO & Beamforming
First Massive MIMO, Beamforming and Beamtracking with phased array technology
2Q15

mmWave
First 10 Gb/s throughput in mmWave- 73 GHz
2Q15

cmWave
First 19 Gb/s throughput in cmWave -15 GHz
3Q15

mmWave
PoC@60 GHz with phased array technology
2Q16

cmWave
42 Gb/s at 28 GHz in Nokia Shanghai Bell Labs
2Q16

5G-Interface pre-3GPP
First real time 8K HEVC video transmission over 5G radio technology
2Q16

Nokia, Bell Labs

5G

Mobile Edge Computing
First Mobile Edge Computing with Digital A9 motorway PoC
4Q15

Massive Capacity
First >30 Gb/s per user by blending multiple fixed and mobile technologies
1Q16

Massive Connectivity
First >1Million connections in single cell
1Q16

Multi-connectivity
First 5G+4G for >100 Mb/s anywhere
1Q16

Network Slicing
Network as a service for multiple industries
1Q16

Network operations
Automation and QoE management
1Q16

NFV/SDN
Making the Telco cloud, lean, agile and effortless to operate
1Q16

Mobile Edge Computing
Shanghai F1
2Q16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