



NOKIA

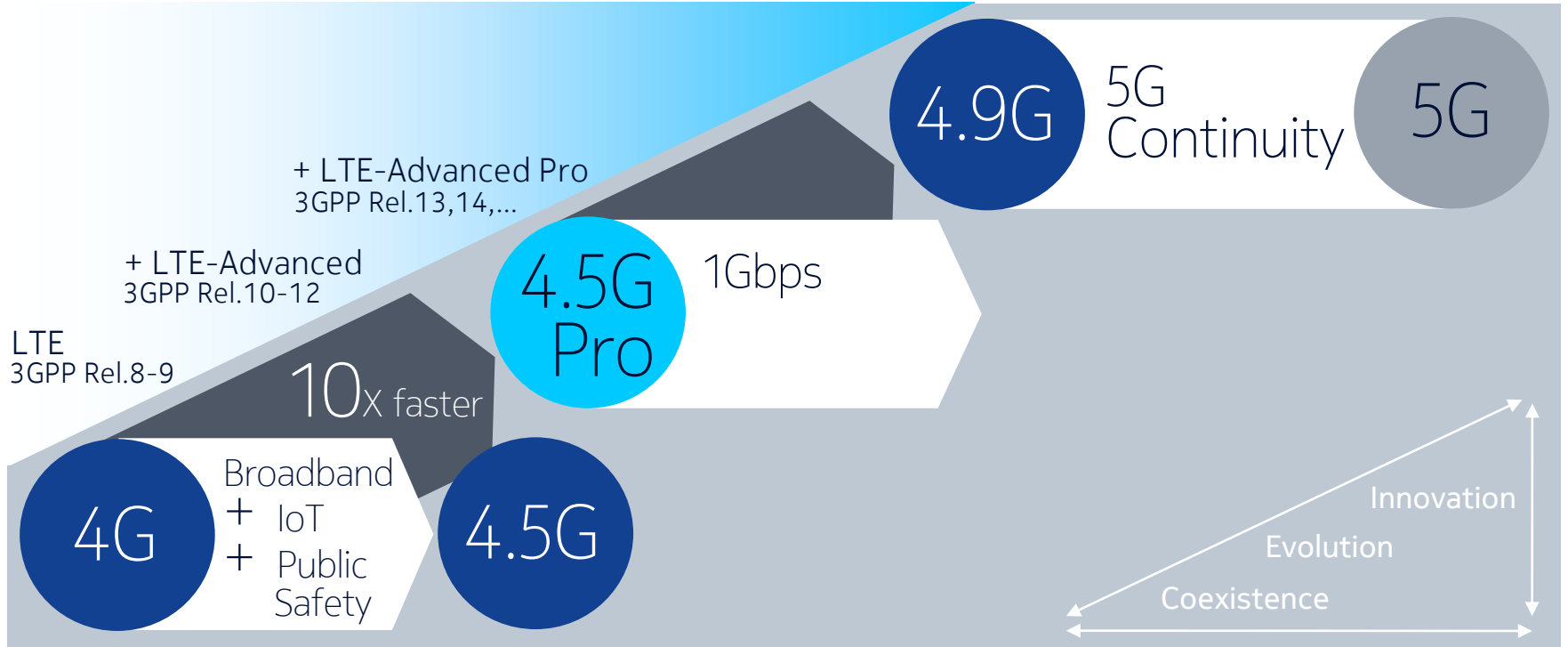
Making 5G a commercial reality.

Vegen til 5G

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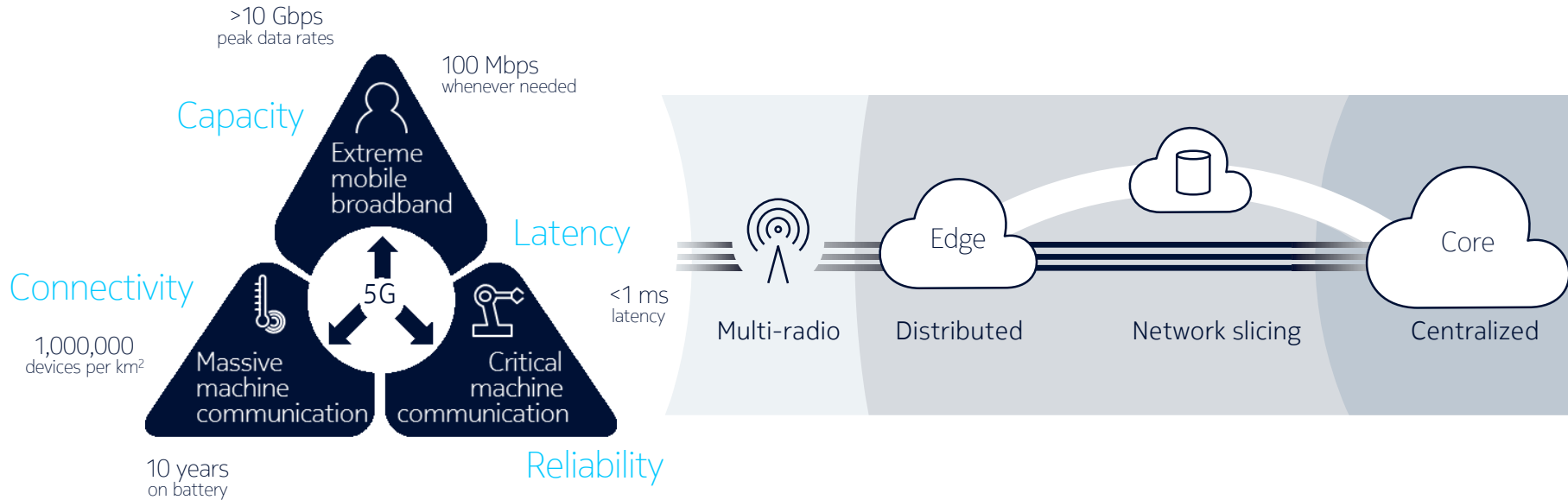
# Nokia 4.5G Pro

10x faster than initial LTE, foundation for further evolution in LTE and 5G



# 5G will introduce huge technological advantages

## 10 Gbps data rate, 1ms latency and ultra-reliability – when and where needed



# 4G networks evolve to 5G

## 4G evolution

IoT

Peak rates

Cloud

Latency

Radio Platforms

Densification

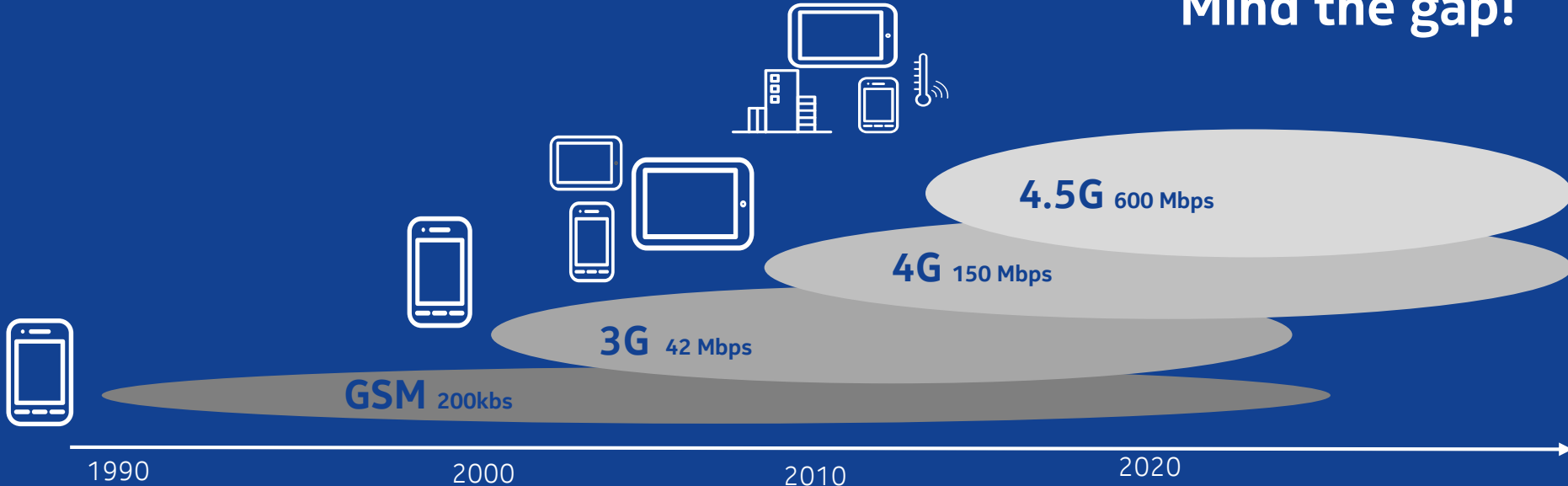


# The path to 5G mind the gap

**5G** > 10 Gbps



## Mind the gap!

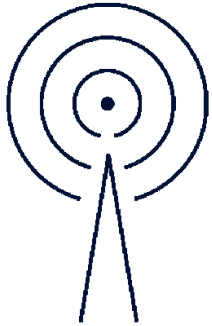


# Nokia 4.9G enables 1.2Gbps with just 60MHz of spectrum

## Proven with commercial user equipment chipset

August 2017

- 1.175Gbps reached with T-Mobile US and Qualcomm X20 (DL Cat.18) on Nokia 4.9G Radio
- Matches the theoretically expected data rate and is about 100Mbps faster than claims of competition



Nokia 4.9G



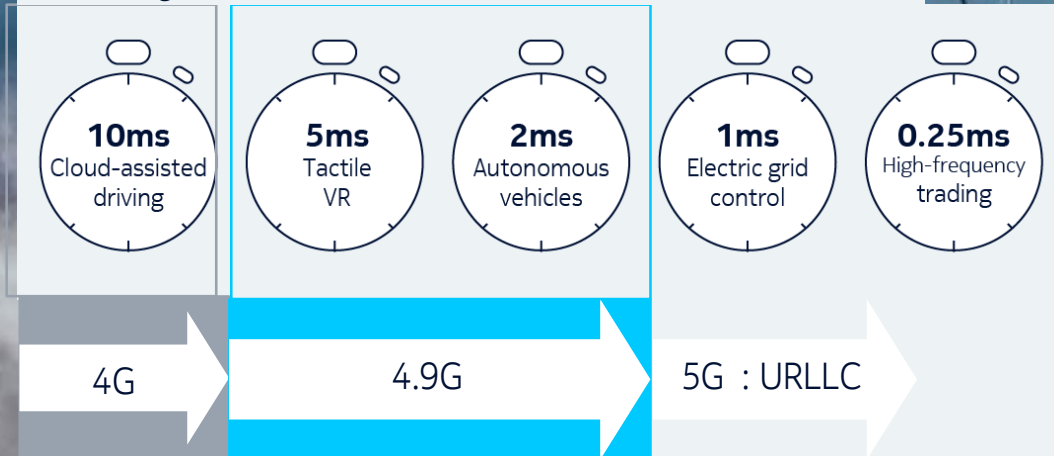
DL Cat.18 UE

# Latency: 4.9G low latency value proposition

Low latency communications expand the possibilities of connectivity

Low latency is a key enabler of new use cases

- Phenomenal experience
  - e.g. for virtual reality
- High safety
  - e.g. to reduce road accidents\*
- Better healthcare
  - e.g. remote surgery\*
- High productivity
  - e.g. in smart factories\*



Low latency on 4.9G

- Leverage existing LTE deployments
  - 75% population coverage by 2020
- Concurrent use of legacy LTE devices and new low-latency LTE devices
  - >4bn LTE subscriptions by 2020
  - New low-latency LTE devices based on 3GPP Rel.15
  - **Maximized utilization** of low frequency bands by serving all users, those with legacy and those with new devices
  - **Flexible migration timeline** for operators to migrate subscriber base to new devices

\*Note: selected applications require ultra-high reliability and low latency communications (URLLC), which require 5G. Other applications require just low latency, as possible with 4.9G

# The path to 5G

## Close the gap



1990

**GSM** 200kbs

2000

**3G** 42 Mbps

2010

**4G** 150 Mbps

2020

**4.5G** 600 Mbps

**4.9G** > 1 Gbps

**5G** > 10 Gbps





NOKIA

We create the technology to connect the world

