

5G Briefing Istanbul

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5G Briefing

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Not only about speed

Much more than mobile
broadband connectivity

5G enables the
industrial Internet



Industry transformation

Smart Cities / IoT

Connected cars

...and much more

AND new spectrum will be needed

Customer Needs

- Video on Demand and Gaming (AV/AR)
- Expectations of Fast, Uninterrupted Service, Even in Crowds
- IoT/Connected Homes and Cars
- D2D
- User-generated Content
- UHD/Holograms
- eHealth
- Mass Transportation
- Cars and Drones
- Critical Communications (Security, Emergency Response)
- M2M – Industrial/Factory
- eCity/eFarm
- Inventory Management

Challenges

- Meeting the Needs of Widely Diverse Connectivity Requirements
- Edge Connectivity
- Edge Densification
- Edge Cloudification
- Network Slicing
- E2E Flexibility
- E2E Programmability
- Dynamic Orchestration of Modular Solutions

Network Characteristics

- Very Low Latency (1 ms)
- Ultra-high Reliability and Availability
- Location Precision
- Security
- Massive Traffic Capacity (10 mbps/km²)
- Spectrum Efficiency (2-5x)
- High Mobility (500 km/h)
- Lower Cost
- Improved Performance
- Improved Service Experience (100 mbps)
- Massive Devices
- Connection Density (10⁶ per km²)
- Signaling Reduction
- Energy Optimization
- User-generated Content

December 2017: 3GPP approved an interim set of Release 15 specs defining 5G New Radio (NR) in Non-Standalone operation

- enabling initial 5G NR deployments utilising the existing 4G/LTE core network
- facilitating trials and commercial deployments with smartphones in consumer markets by 1H 2019

June 2018: 3GPP scheduled to finalise Rel. 15 complete specifications for 5G NR in Standalone operation, including the 5G Core Network

The *full* 5G system includes:

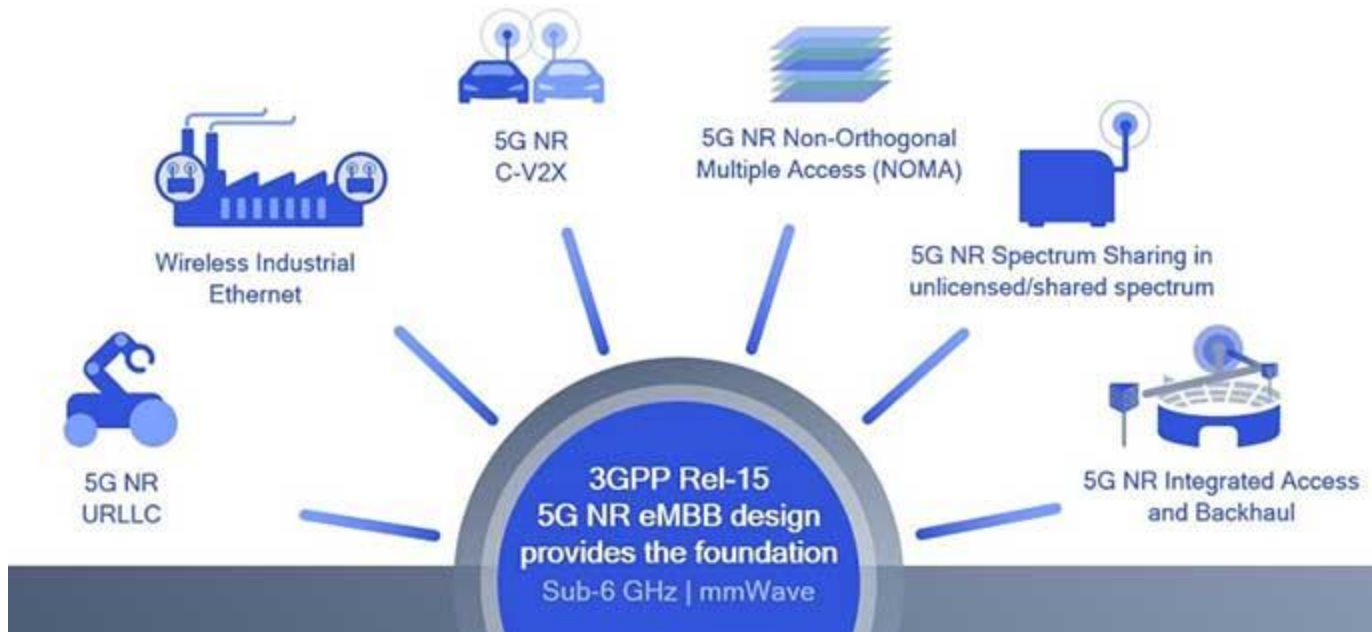
- eMBB (Enhanced Mobile Broadband)
- URLLC (Ultra Reliable Low Latency Communications)
- mMTC (massive Machine Type Communications)

Initial phase of 5G Non-Standalone deployments focuses on eMBB, giving:

- more data bandwidth
- moderate latency improvements on both 5G NR and 4G LTE

This should assist development of MBB use cases e.g. AR/VR media & applications, UltraHD, 360 degree streaming video, and more

Release 16 – expansion of the mobile ecosystem to new areas



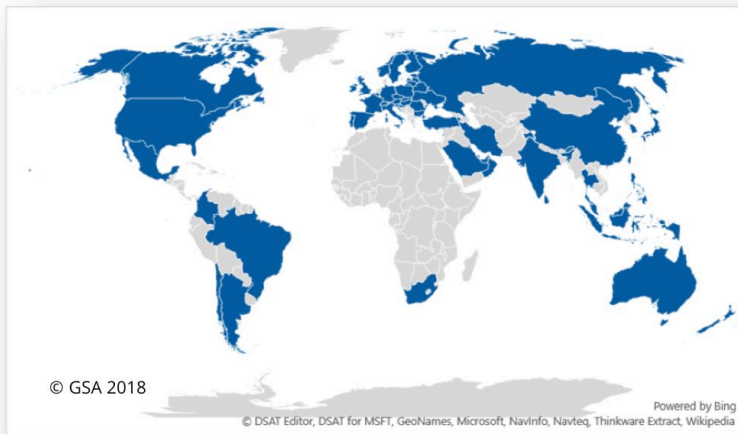
Source: Qualcomm Inc.

5G TRIALS – SNAPSHOT APRIL 2018



Where 5G trials are taking place, and what they involve

Countries with operators that have been, are conducting or are planning to conduct 5G trials



These slides contain extracts from the GSA report “5G Update: Global Market Trials” available from the GSA website at www.gsacom.com

- By the start of April 2018 GSA had identified **134** operators, in **62** countries, that have demonstrated or are testing, or trialing, or have been licensed to begin field trials of 5G-enabling and candidate technologies. (The numbers in early January were 113 operators in 56 countries.)
- Operators have announced over **326** separate demonstrations, tests or trials that we have been able to identify.
- At least 61 projects have involved testing Massive MIMO in the context of 5G (i.e., MIMO trials involving 64 or more transmitters, or lower order MIMO used on new high frequency spectrum bands, or involving some other 5G aspect such as New Radio characteristics).
- At least 73 have been demos, tests or trials of New Radio technologies (up from 42 since our last report), and 19 projects explicitly featuring network slicing.