

# Orange 5G vision



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**New Street Research - 5G Seminar: The roadmap takes shape**

**6<sup>th</sup> September 2016**

# 5G : The radio system

we will operate in the 2020-2030 decade

- 5G is the future Internet as a whole

- radio: existing (4G, Wi-Fi) and a new radio
- a convergent core network NGCN managing fixed and radio accesses (fiber, 4G, 5G radio, Wi-Fi, etc.)

- 5G will deliver more than connectivity

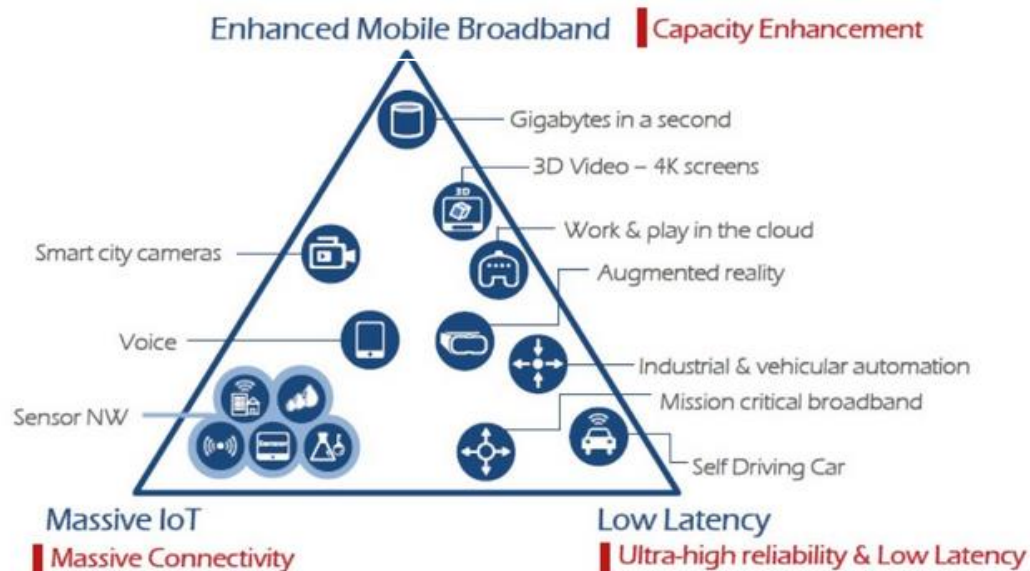
- new business models and value propositions
- new services
- enabled by a unified infrastructure integrating networking, computing and storage resources

		services	techno	timing
1 G	analogue radio	voice	NMP	80's
2 G	digital radio	voice, SMS	GSM	90's
3 G	broadband radio	voice, SMS, data	UMTS	00's
4 G	very high broadband	IP services	LTE	10's
5 G	?	?	5G	20's

# Industry key requirements

many services provided by a single network

## 3 angles for 5G : Broadband, IoT & low latency



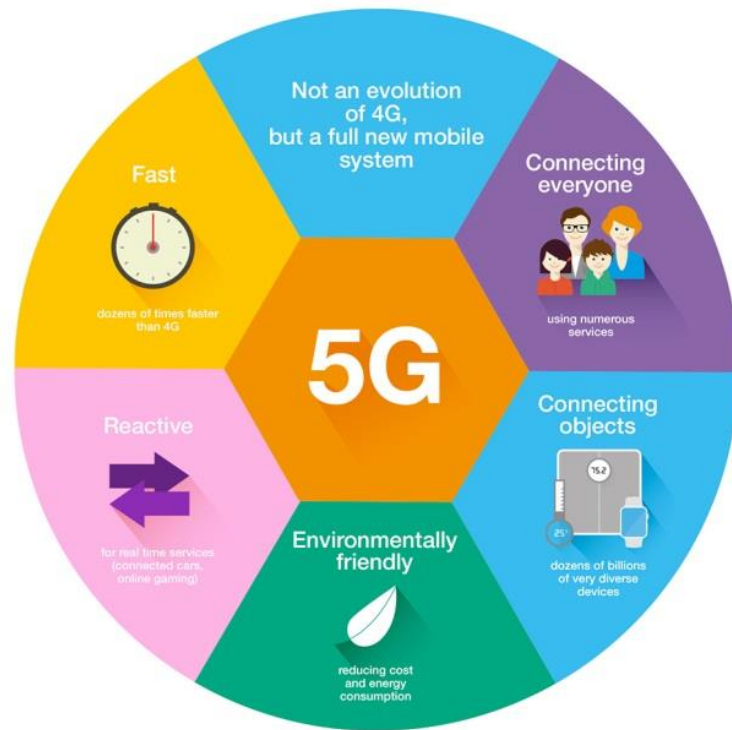
(Source: ETRI graphic, from ITU-R IMT 2020 requirements)

## key performance objectives

- **lower latency**
  - 1 ms pour URLLC
  - 8 ms for eMBB
- **higher minimum throughput**
  - 50 Mb/s “everywhere” (cell edge)
- **higher capacity**
  - spectral eff. x10 vs. LTE-A
  - x3 with Massive MIMO and
  - x3 with New Radio in cm/mmWaves
- **higher peak rate**
  - 10 Gbps in cm/mmWaves
  - 1 Gbps in 3.5/3.7 GHz
  - 2 Gbps with 4G+5G aggregation
- **higher reliability**
  - towards 99.999%

# Orange key requirements for 5G

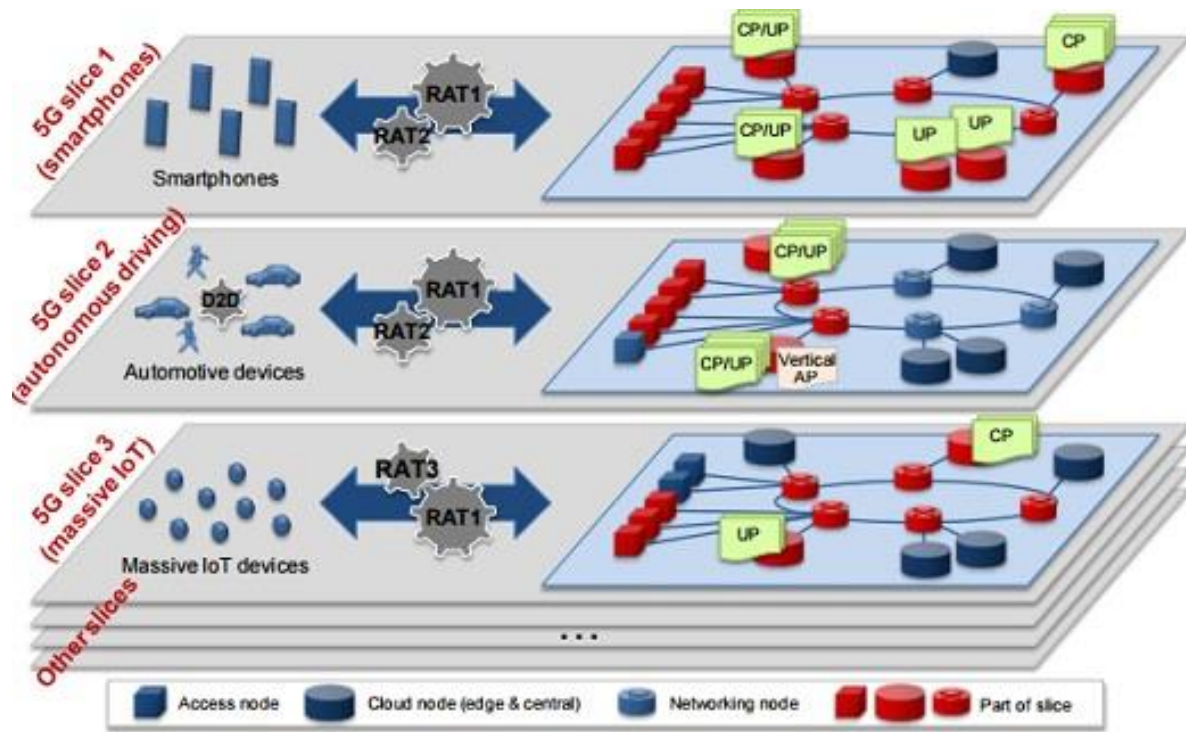
- Low power consumption
- Homogenous user experience
- Support ultra low cost networks
- Cost efficiency with variable cost model
- Security and privacy
- Flexibility for future evolutions



# 5G architecture

## network slicing

- Virtualised network functions and distributed cloud
- “Enablers” available through APIs, to provide specific services
- Fit to serve verticals
  - Industry 4.0, transport, health, media, automotive, energy, retail, banking, insurance, government, etc.



network slices: virtual sub-networks pre-programmed to serve specific services using dedicated or shared resources

timing

# 5G timeline

technical studies are starting in standards

## Research



Wave 1

Wave 2

## Industry



★ 5G white paper

5G Work Programme

## Standardisation



Reqs. & initial studies

Phase 1 specs.

Phase 2 specs.

End 2019:  
Phase 2  
(Release 16)

★ Launch of RAN technical studies

Mid 2018:  
Phase 1 (Release 15)

## Spectrum



Identification of 5G spectrum candidates

WRC '19

Spectrum release

## Orange deployment

Demos

Large-scale field trials

Deployments

2015

2016

2017

2018

2019

2020

# 5G for Orange

in a nutshell

- **5G will arrive starting ~ 2020 with**
  - significantly enhanced user experience
  - significantly enhanced network performance, especially cost efficiency
  - support of new services (new IoT services, verticals, ultra low-cost networks)
- **Our business with vertical players being developed on 4G evolutions (IoT, Private Mobile Radio), preparing for future 5G markets**
- **4G/LTE and fiber/FTTH will continue to evolve, and will become components of 5G**
- **Large scale field trials are next main step on the road towards 5G commercial services**

# Thank you

