

5G – a Network Operator's Point of View

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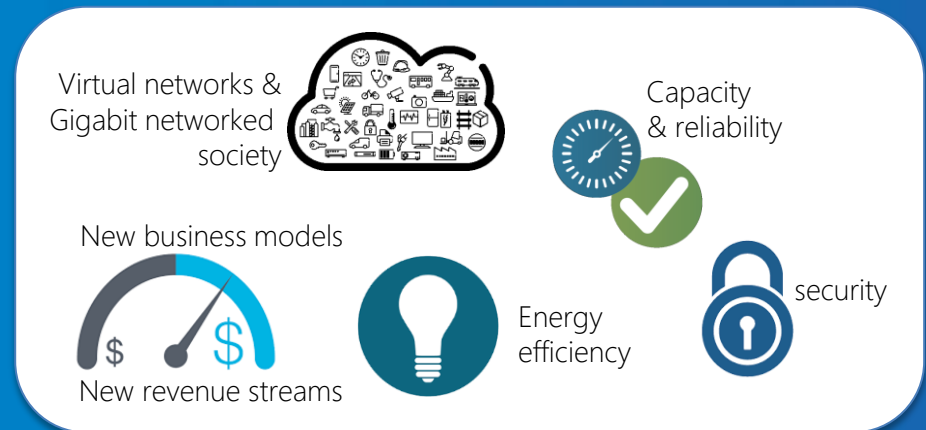
11 July 2017

5G ?

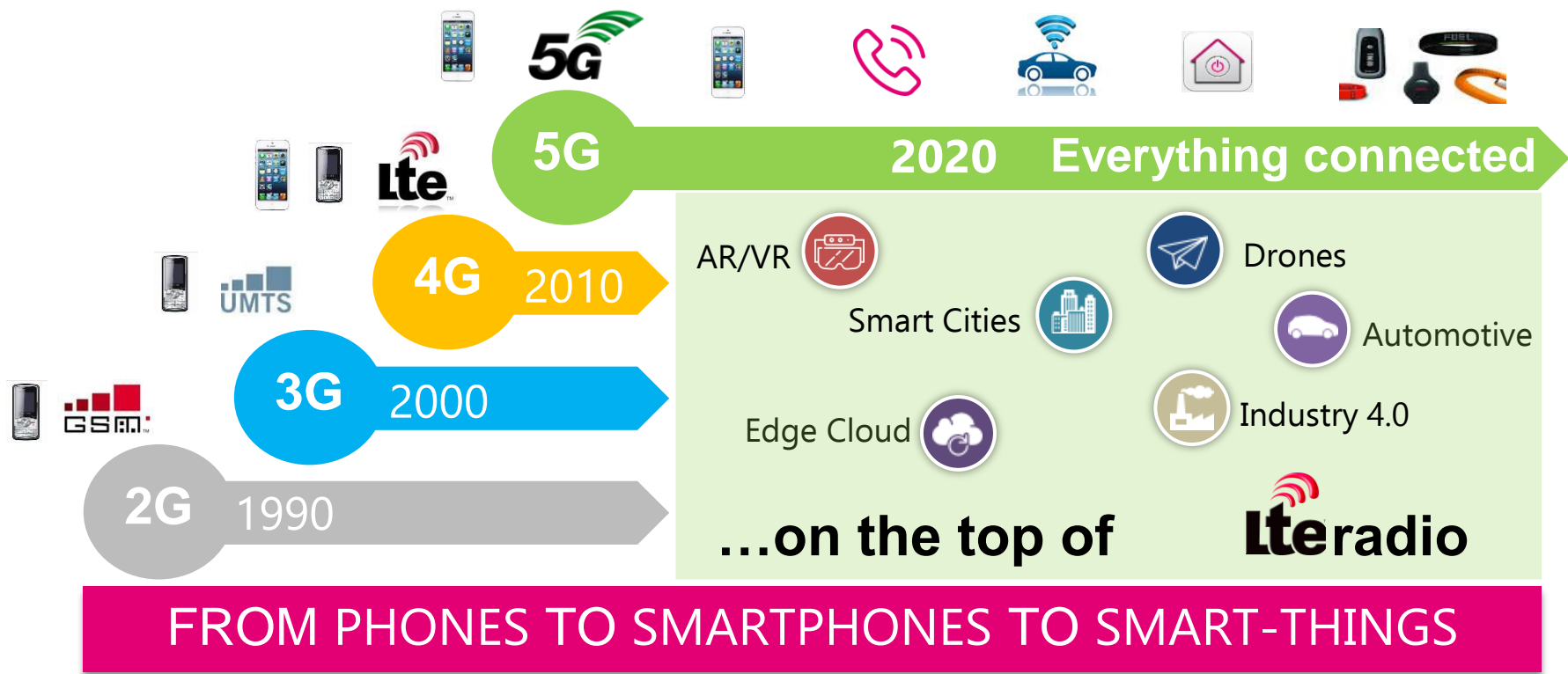
- Is 5G a solution to all our problems?
- or
- 5G is a solution waiting for the problem?

From a different perspective:

- Is 5G just Evolution?
- or
- 5G is a Revolution

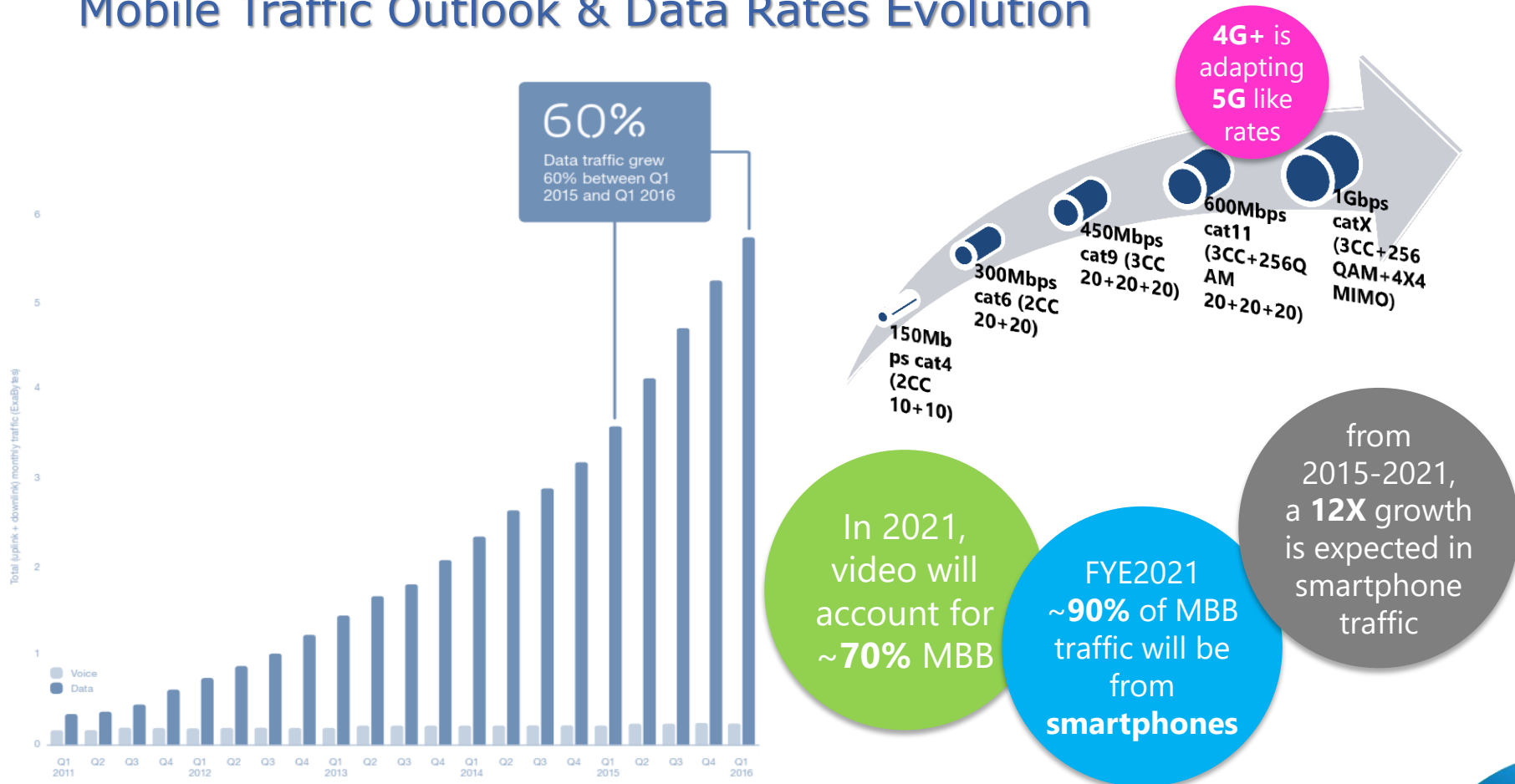


What 5G means to Network Operators and Service Providers



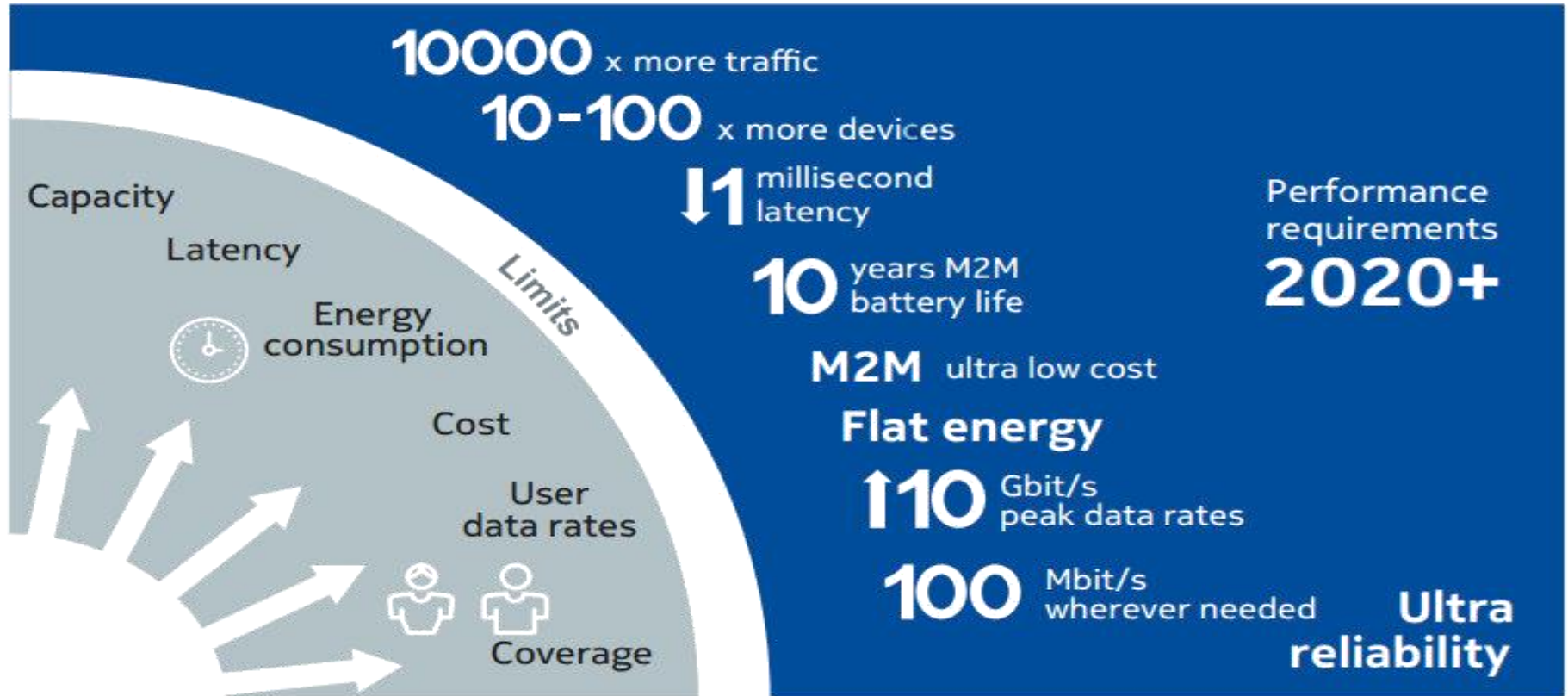
Global Mobile Broadband Facts

Mobile Traffic Outlook & Data Rates Evolution

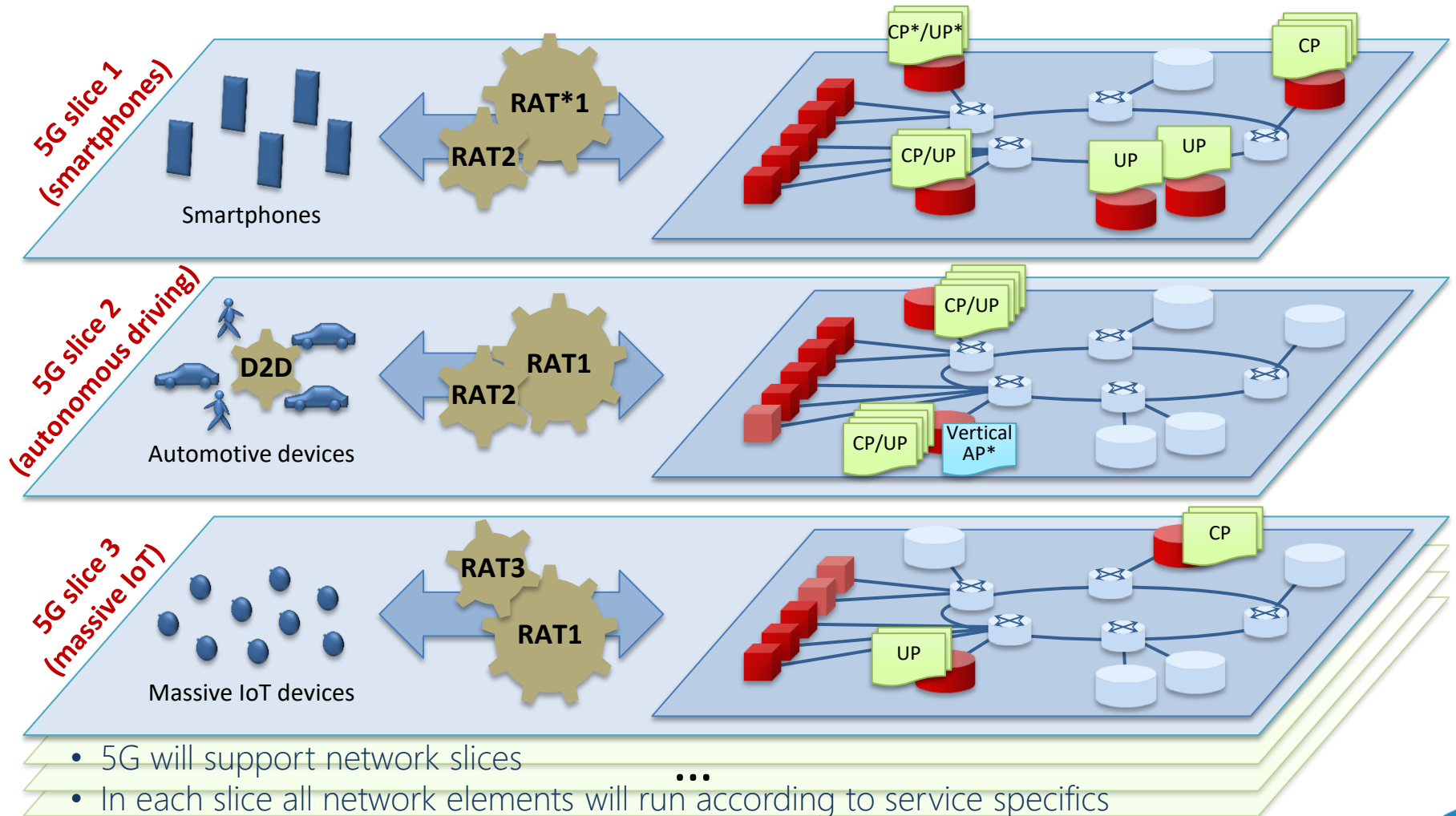


source: ERICSSON mobility report - June 2016

5G Basic Requirements



5G Architecture - Network slicing



* CP = Control Plane, UP = User Plane, Vertical AP = Vertical Access Points, RAT = Radio Access Technology

Network slicing as a key enabler for different products/services on the same infrastructure

Situation: Diversity of use cases call for flexibility

SENSOR NETWORKS



AUTONOMOUS DRIVING



E-HEALTH SERVICES



PERVASIVE VIDEO

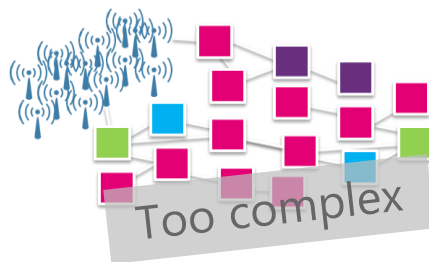


5G Networks need to support flexible levels of:

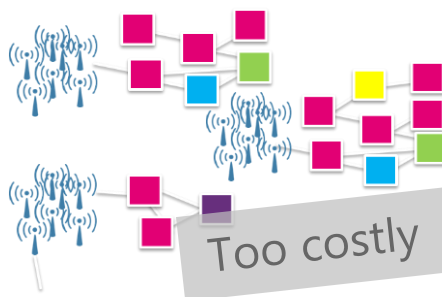
Mobility, Latency, Bandwidth, Coverage, Functionality , ...

Challenge: Limitation of classic solutions

„All in One“ Network

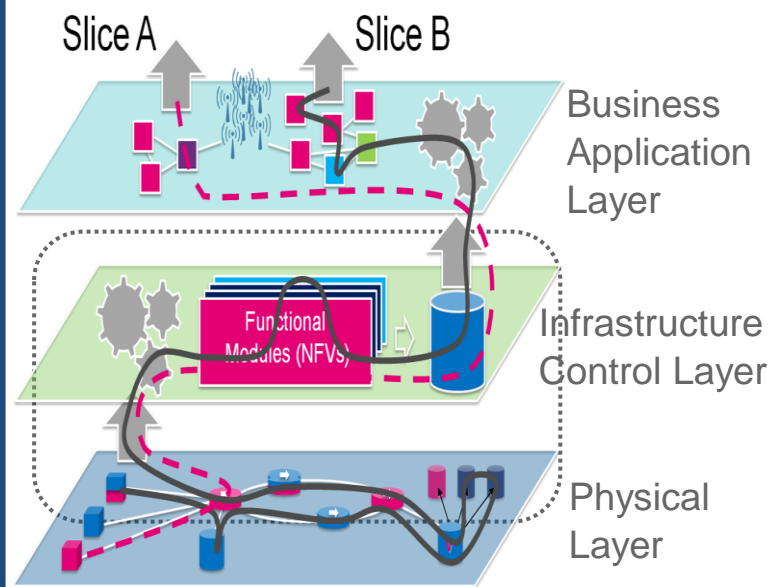


Multiple Networks

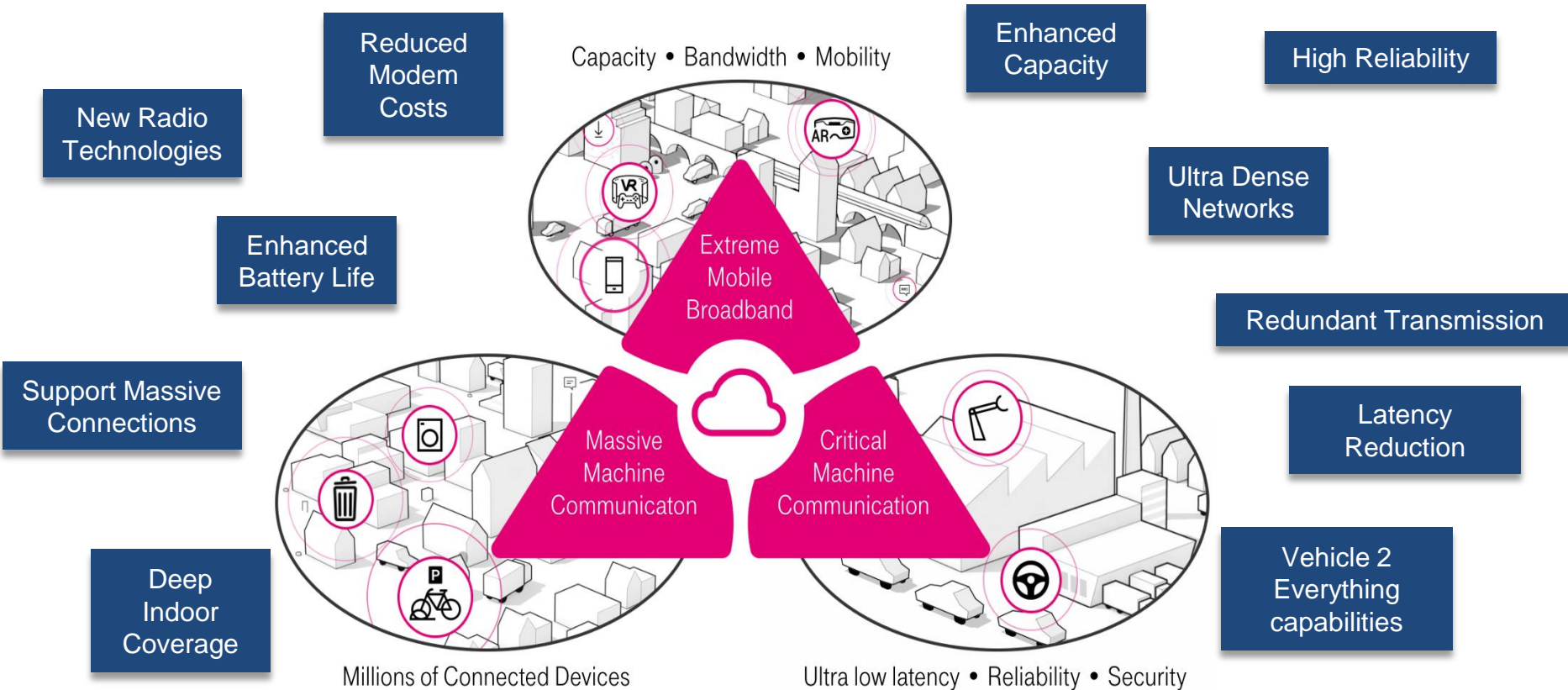


Solution: Multiple logical network build on one physical infrastructure

Strong capabilities for tailored solutions, guaranteed resources and fast provisioning



Network slicing leads to heterogeneous benefits



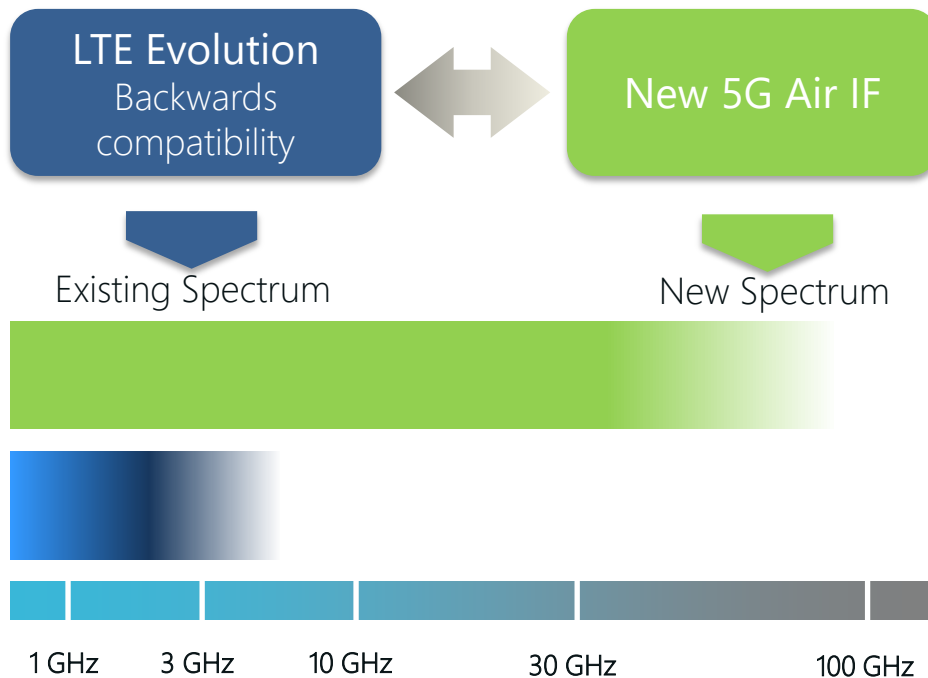
5G most likely will operate on all bands, but the first services will appear on new spectrum

Main spectrum bands	700MHz–2.6GHz	3.5GHz, 5GHz	27.5–31GHz ('28GHz')	37–42.5GHz ('39 GHz')	70–80GHz ('E-band')
Usage	Traditional mobile bands	New bands to be released for 5G			
Multiples of assignments	Tens of MHz		mmWave		
Amount available	<1GHz		100s of MHz		
Maximum cell radii	Tens of kilometers	~1km	45GHz		
			Tens to hundreds of meters, depending on LoS		

Source: Analysis Mason Study

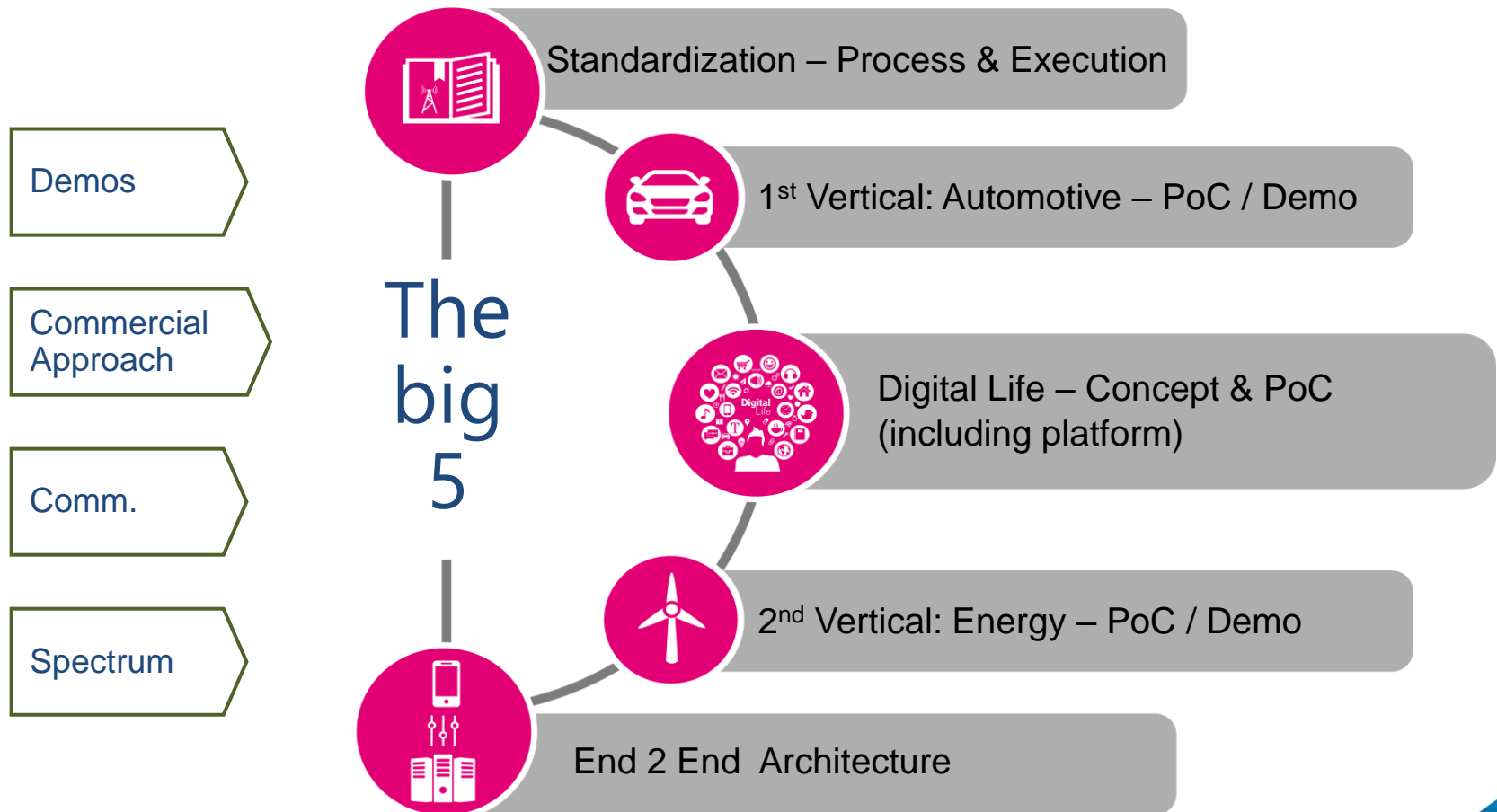
5G Air Interface

Massive channels, massive MIMO

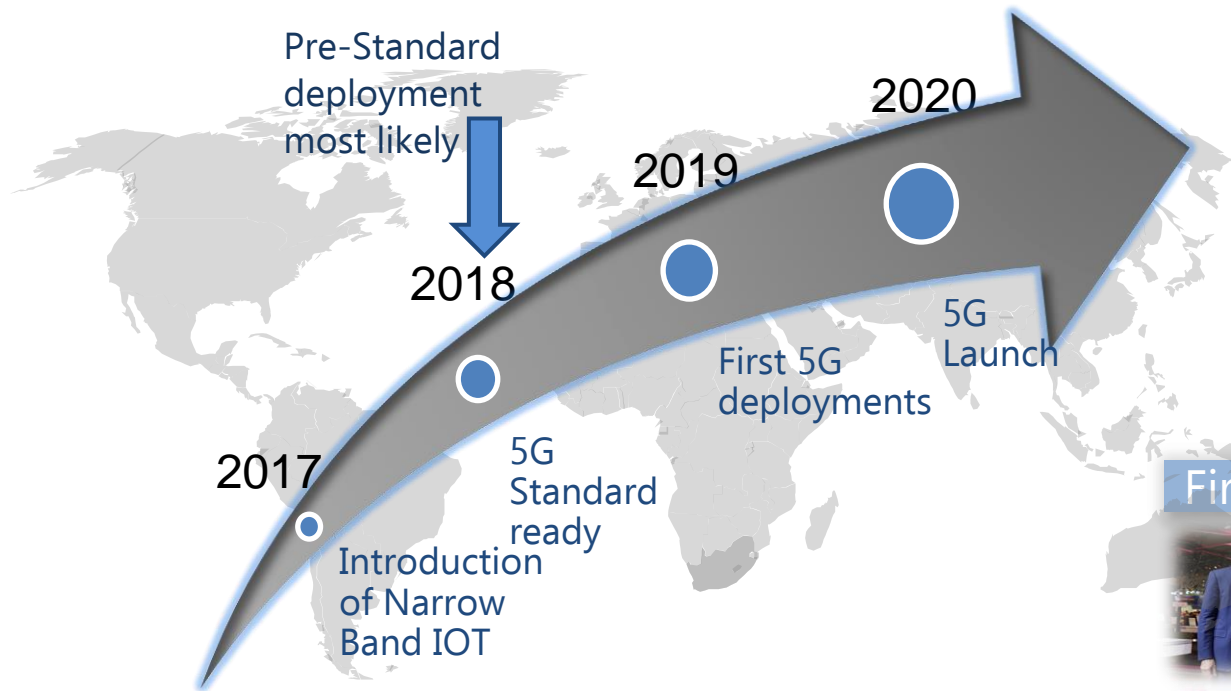


- Evolution of existing technology adding new RAN technology
- LTE+ and New Air Interface combined allows rapid switching based on radio conditions
- New Air Interface initially applied at new spectrum (up to millimeter waves) with super channels, massive MIMO & beam forming
- Gradual migration of New Air Interface into existing spectrum

5G DT group Focus Points for 2016/2017



5G short term "goals"



First achievements



< 1 ms latency



> 70 Gbps speed



> 1.5 Gbps per device

5G in a nutshell

- 5G is being developed as a solution for a multitude of existing problems
- 5G will cause a revolutionary evolution of our existing network(s) and services
- 5G development should be driven by Customer Needs
- 5G should become (new) Service Enabler
- 5G slicing is key for a successful implementation
- 5G system orchestration is native SDN/ NFV* structure
- 5G's New Air Interface will require new frequency bands
- Massive IoT, Energy, Autonomous driving and Ultra-Mobile-Broadband are foreseen as the first applications for 5G

* SDN/NFV: Software Defined Networks / Network Function Virtualization

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Thank you your attention,

see you in 2020 to review what
was achieved and what remains
to be done

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Q & A