

*Telefonica*

Telefonica's  
Journey to 5G\_

Enrique Blanco - Global CTO

You choose. We connect\_

# We want our Clients to enjoy all the Benefits of the Digital World



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DISCOVER, DISRUPT, DELIVER

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# New Services Demand Higher Speeds and Quality Assurance



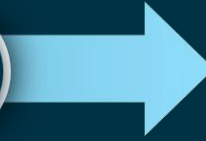
We are already working  
on the  
evolution of the network  
from LTE-Advanced  
to the 5G Network of the  
future ...



# Under a New Technological Approach

BEFORE

MOBILE GENERATIONS



NOW



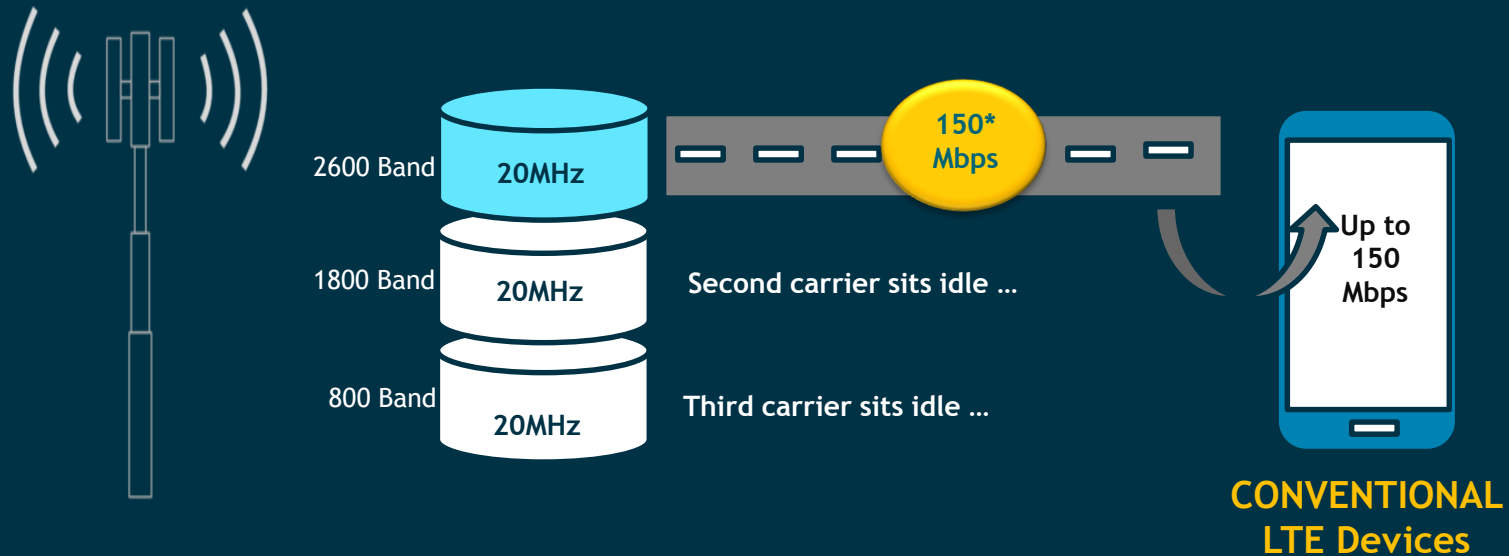
Already anticipating desired 5G features on LTE-Advance Networks

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# From Conventional LTE Networks

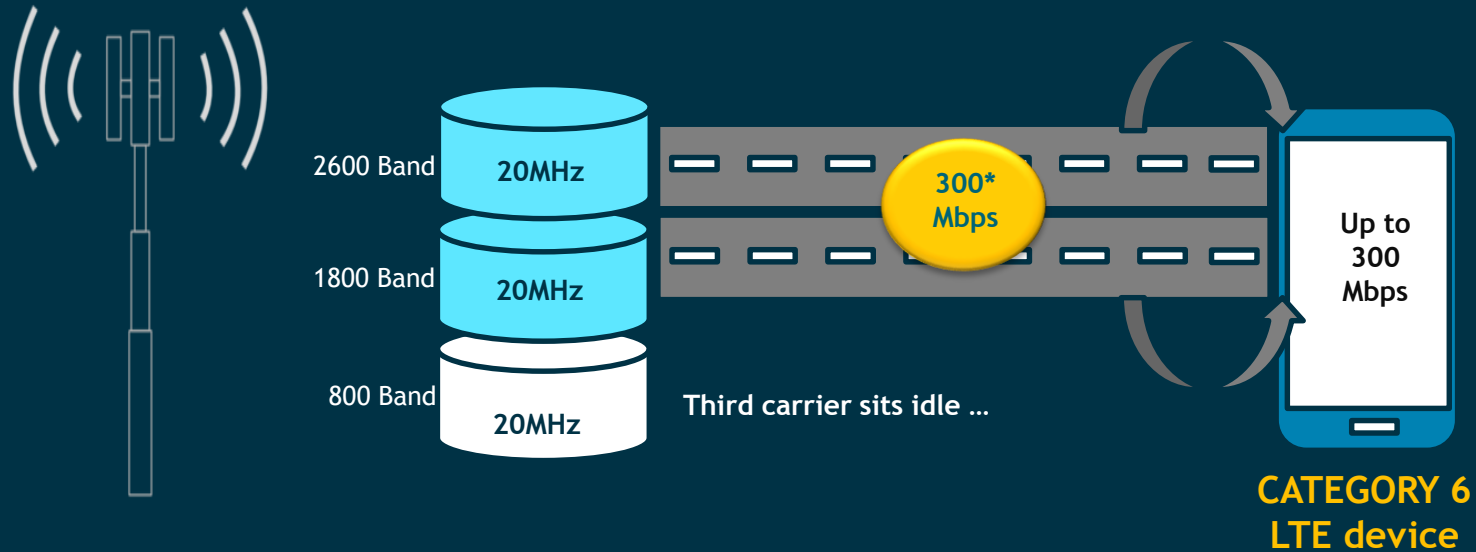
## *Conventional LTE Network: single carrier approach*



\* TEORICAL with 20 MHz

# To already commercial LTE- Advanced Networks

## *LTE Advanced Network: 2x Carrier aggregation*



\* TEORICAL with 40 MHz

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# A World where Capable Devices are KEY

## LTE CAPABLE DEVICES



\* <https://www.qualcomm.com/news/onq/2014/06/20/importance-lte-cat6-samsungs-galaxy-s5-broadband-lte>

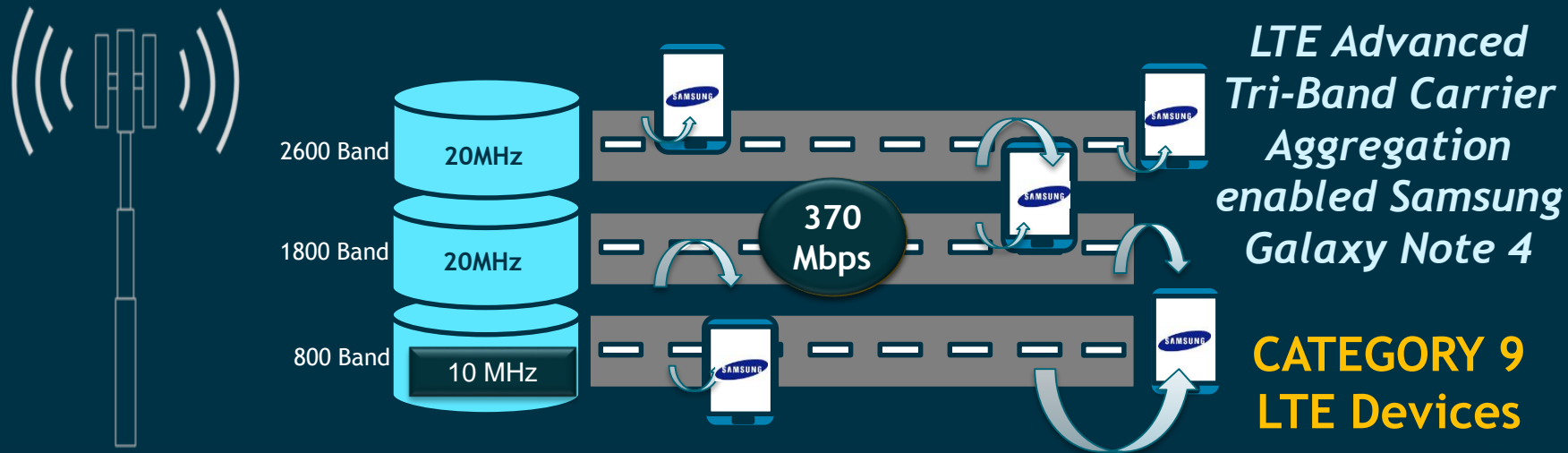
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# At MWC we go one step further ...

## LTE Advanced Network: 3x Carrier aggregation



First experience out of Asia of up to 3x LTE Advanced CA in live network 800 + 1800 + 2600 (50 MHz) with Category 9 “Ready to Market” Devices from Samsung

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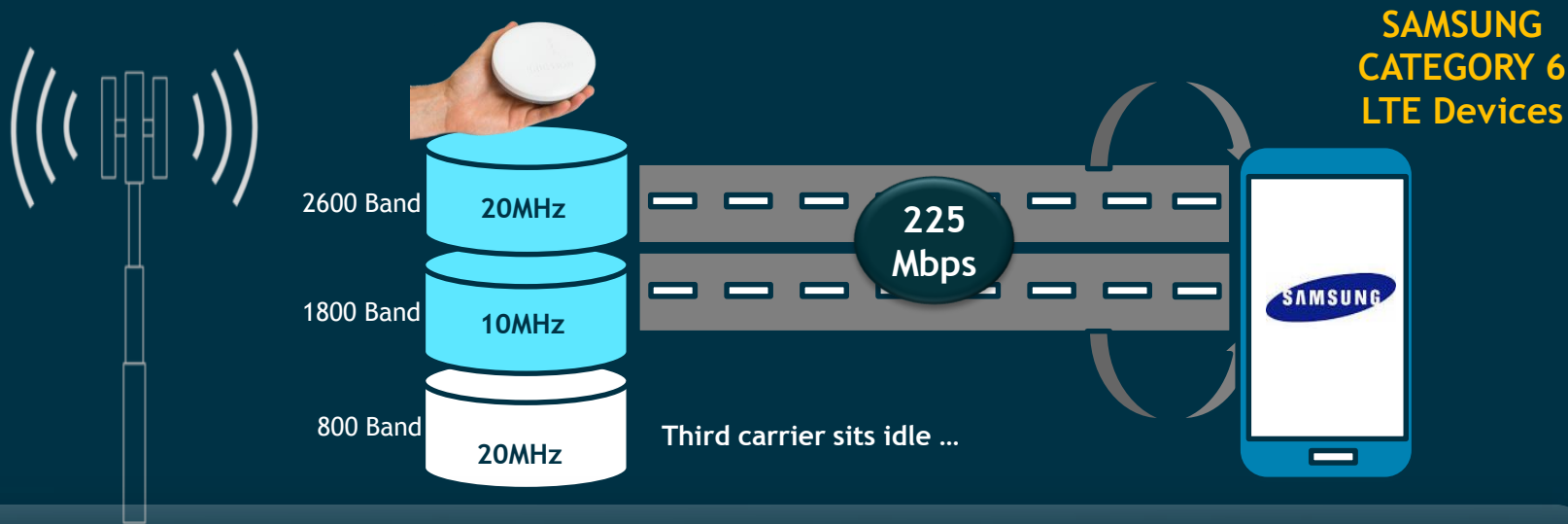
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\* TEORICAL with 60 MHz

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# And even further ...

*Dual CA + the most advanced indoor coverage solution*



Last MWC 's most applauded vendor solution (Ericsson's Radio Dot System) **First time in a large event live in a commercial network**

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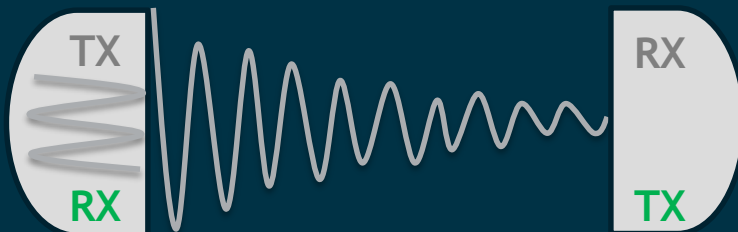
We are bringing the  
solutions of the future ...

SPECTRUM IS A **SCARCE** AND **LIMITED**  
RESOURCE...

# 5G Full-Duplex Revolution: multiplies the speed /no added spectrum

## TODAY

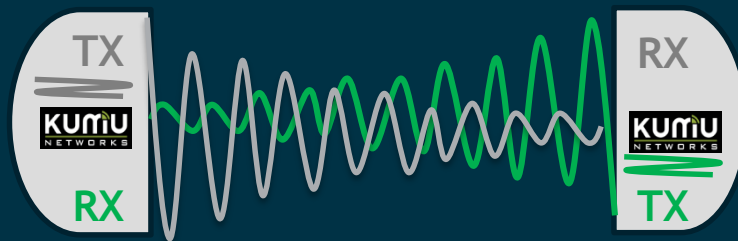
Radios can't transmit and receive at the same time on the same channel



Self-Interference is billions of times stronger than the received signal

## IN THE FUTURE & IN TEF BOOTH AT MWC

FULL-Duplex enables to transmit and receive on the same channel



A patented self-interference cancellation technology isolates receiver from transmitter

Self-interference cancellation enables full-duplex and **doubles spectral efficiency**

# Common vision on the expected functionalities of 5G



X1000 VOLUME OF DATA TRANSPORTED PER UNIT

10-100X MORE DEVICES CONNECTED  
SIMULTANEOUSLY

100MBPS WHEREVER NEEDED

10X INCREASE IN BATTERY LIFE.

-5X END-TO-END

ULTRA-RELIABILITY

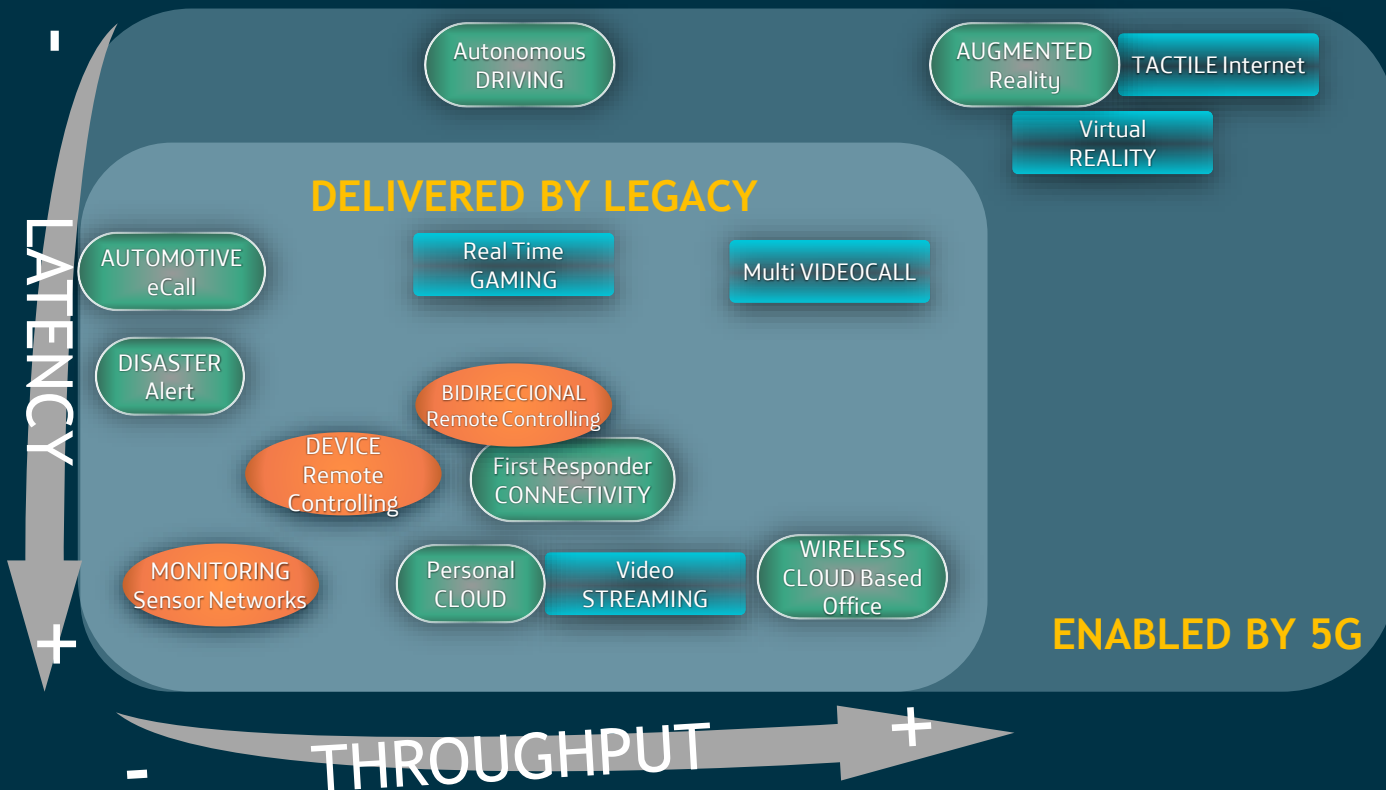
1 MILLISECOND LATENCY

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# To provide a new whole range of services



Better provision of **current services** (lower cost, improved performance, better experience continuity...)

Support **new services, unthinkable with 4G Technologies** (ultra low latency, massive IoT services,...)

Ability to **personalize services for specific applications** (vertical industrial applications, safety,...)

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# Telcos' networks make the Digital Revolution possible



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# Telefónica has a strong focus ...



+ FTTH

75% CapEx  
devoted to  
transformation  
& growth



+ IT Modernization

+ LTE

Record in investment FY2014: almost 16% CapEx/sales

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# in accelerating its technological transformation ...

## LTE (FY2014)



>20K

Sites in Service

x2  
y-o-y



60%

Coverage (%pop)



10

OBs with 4G rolled-out and ...  
4G in all markets by 2015

## FIBRE (FY2014)



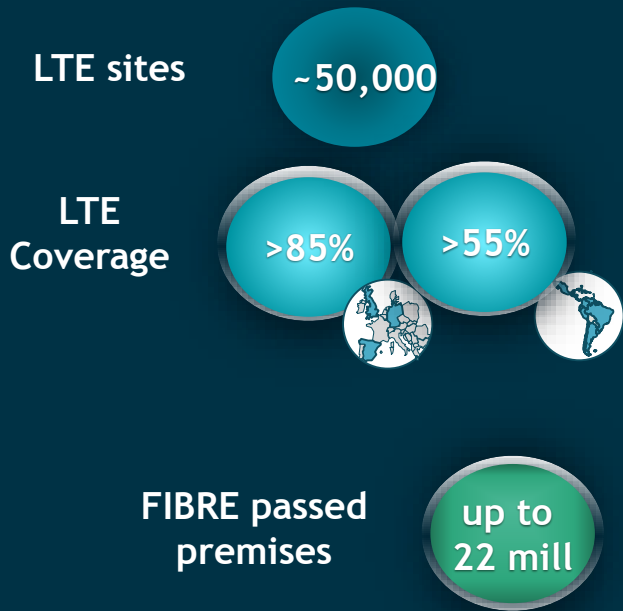
14.7 Mill.

Premises passed

~x2  
y-o-y

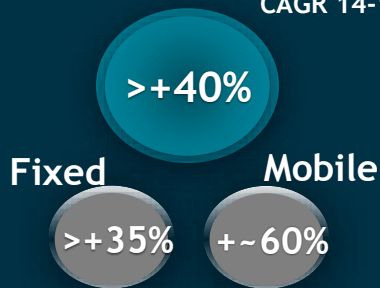
# ... to have differential future-proof network ready by 2016

## MAJOR NETWORK TRANSFORMATION IN PLACE (2016E)

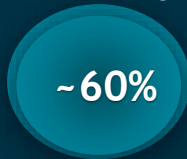


## DATA TRAFFIC EVOLUTION

Total Data Traffic  
CAGR 14-16E



Video traffic  
CAGR 14-16E



## ADVANCED DEPLOYMENTS IN ALL NETWORK LAYERS

- Deploying Optical IP solutions in Core & Transport
- First LTE-A features: 2 carrier aggregation
- Small cells & Indoors solution deployments

Specific TOP PRIORITY projects for ENTERPRISE Services

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