5GPPP Workshop

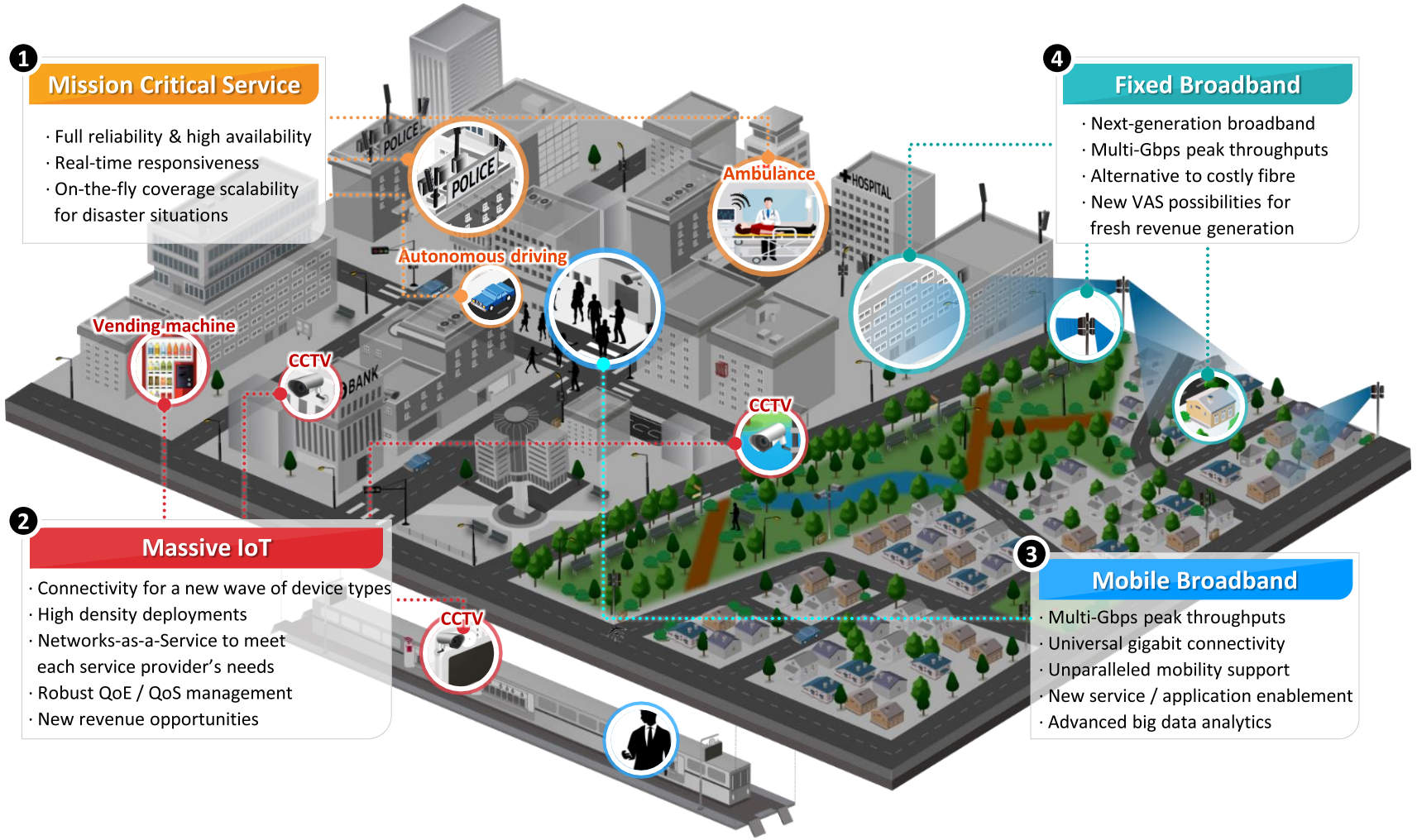
Spectrum for 5G

Session 2: “Early deployment 5G mm-Wave in Asia” – Samsung perspective

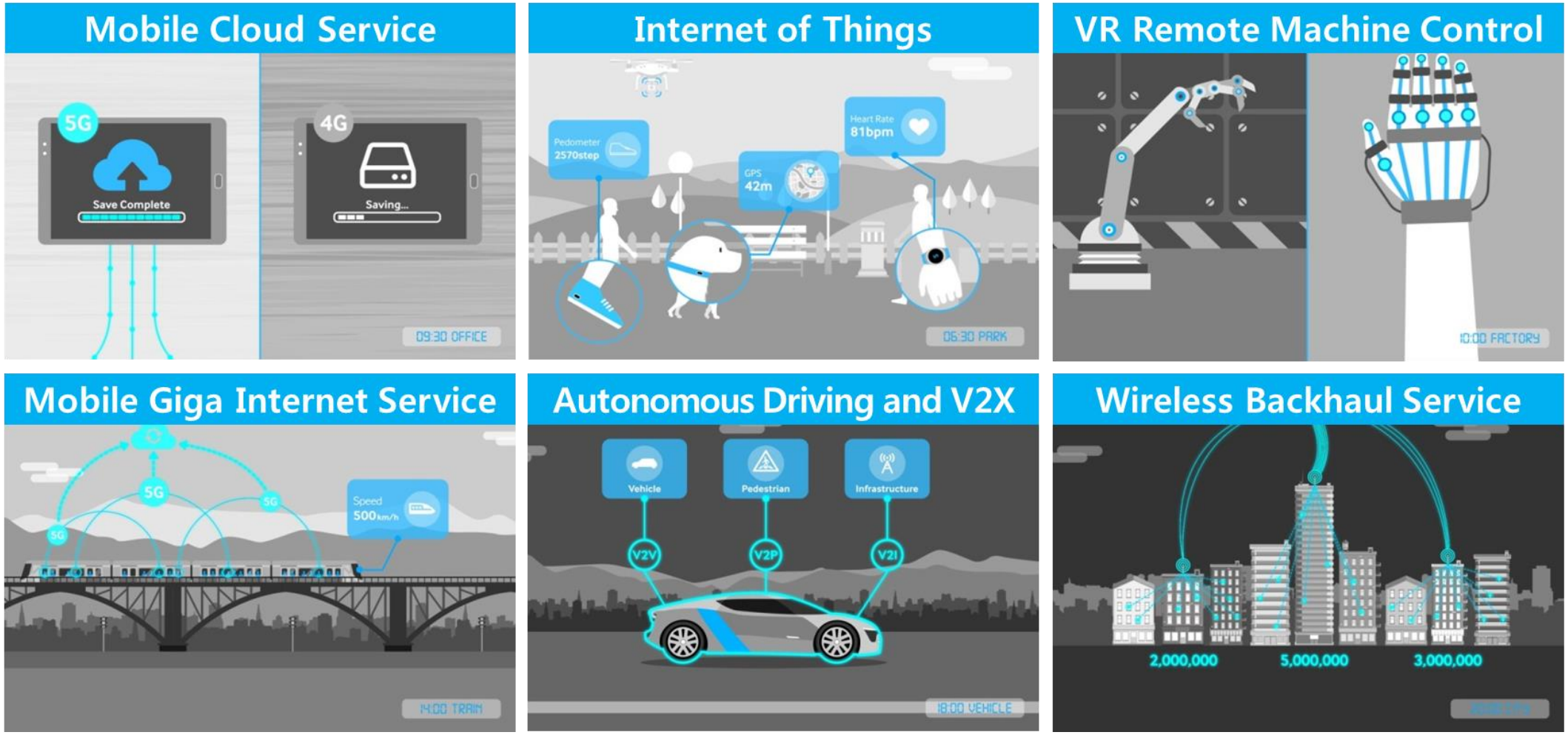
7th June 2017

5G Service Scenario

Key Scenarios to be Addressed throughout the Multiple Stages of 5G Development



5G Service Example



Device Evolution

- Towards a Variety of Devices Serving Specialized Purposes (e.g. VR/AR, Connected Car)

As Is

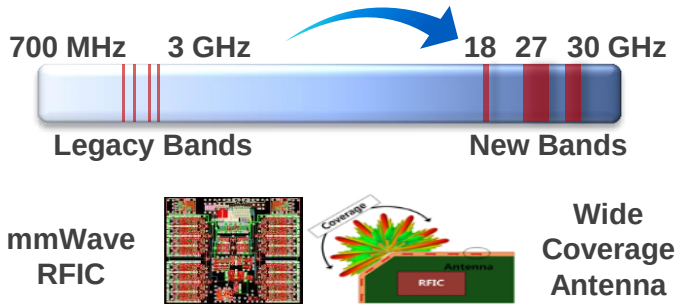
Smartphone as a main device

To Be

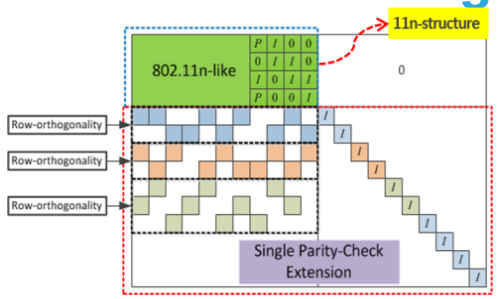
Device types diversified

Key 5G Service Enablers

> 6 GHz System/RFIC/Ant.

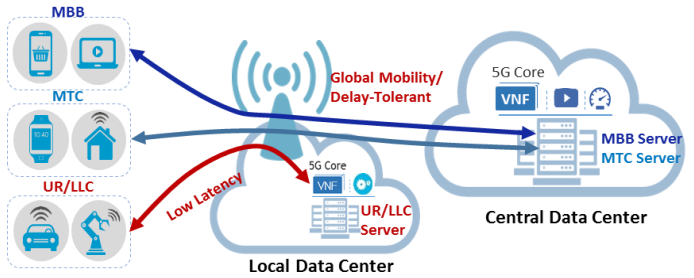


New Channel Coding

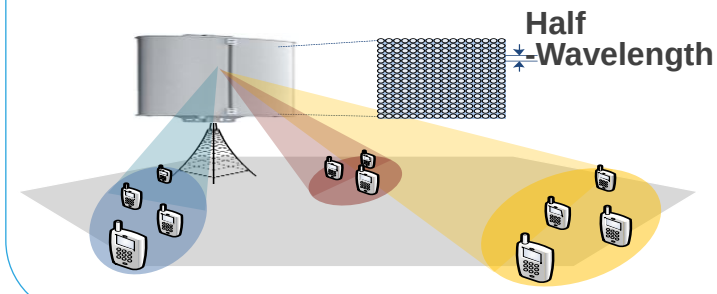


LDPC (Low-Density Parity-Check)

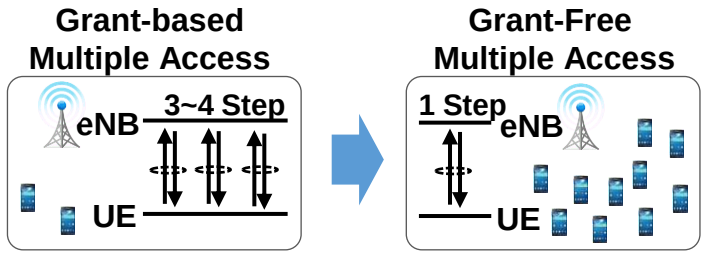
Network Slicing



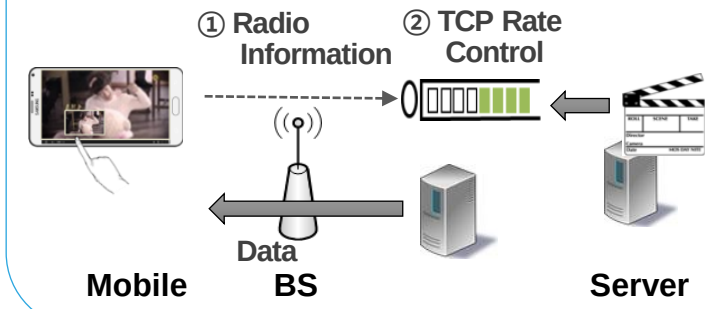
< 6 GHz Massive MIMO



Massive Connectivity (IoT)



Low Latency NW



Samsung’s Innovation

2013 - 2014

Base Station

Mobile Station

World’s 1st mmWave High Speed Test

(’14.10.15)

· 7.5 Gbps at Stationary

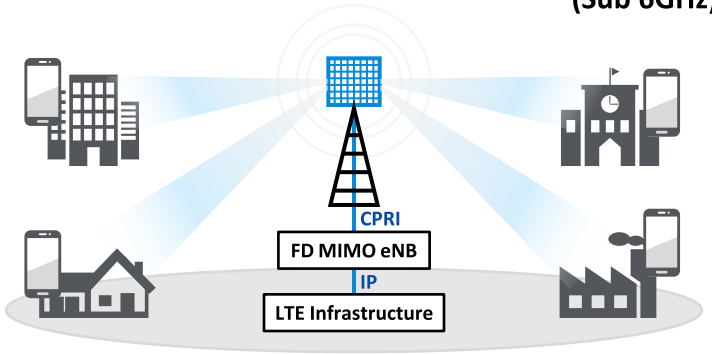
· 1.2Gbps at >100km/hr

2015

· Avg. 1.7Gbps at 25km/hr

FD-MIMO with Massive Antenna Tech.

(Sub 6GHz)



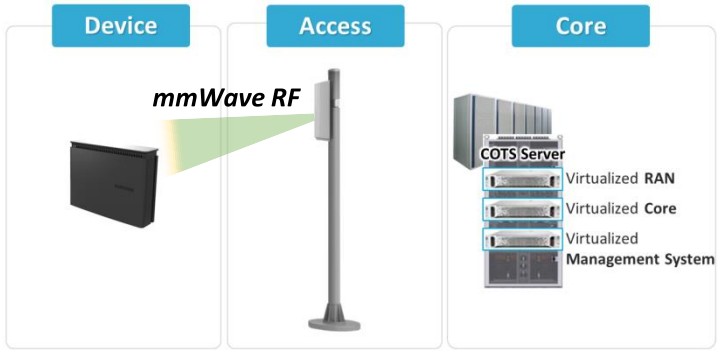
2016

3.7Gbps peak using live commercial backbone NW

‘Samsung Delivers on Gigabit Wireless Promise of 5G’

5G End-to-End Products

(Commercial)



Field Tests in Korea

Handover Test with SKT (Sept., 2016)

SK Telecom, South Korea's largest mobile carrier, and Samsung Electronics have successfully tested handover between outdoor 5G base stations at 28GHz.

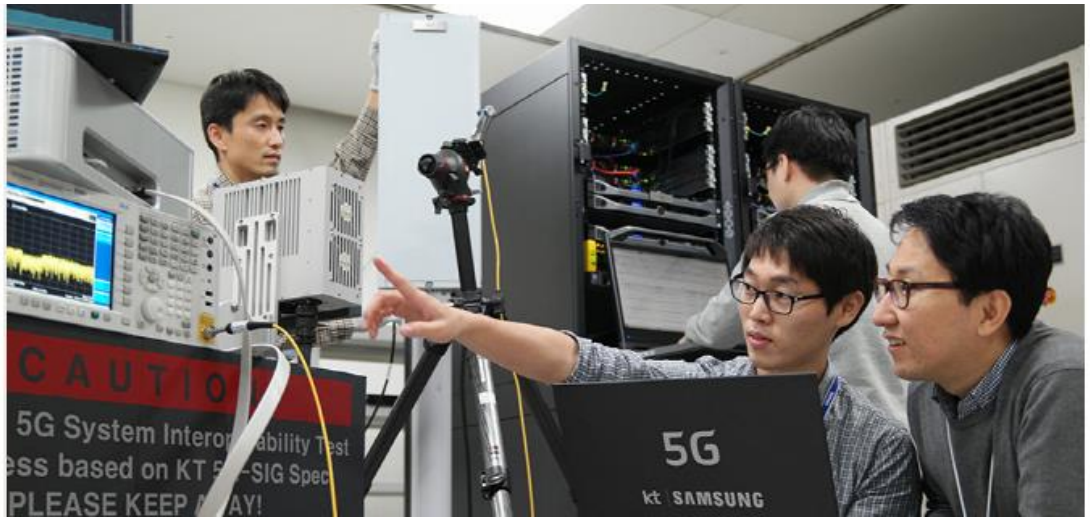
Researchers of Samsung Electronics and SKT are demonstrating a full HD video calling and UHD content streaming service between 5G base stations

Pyeongchang Spec. 1st Call with KT (Oct., 2016)

KT-Samsung Electronics, successful 5G data communication test with Pyeongchang spec.

KT had developed 'KT 5G-SIG" standard with global manufacturers from Nov. of last year to Jun. of this year.

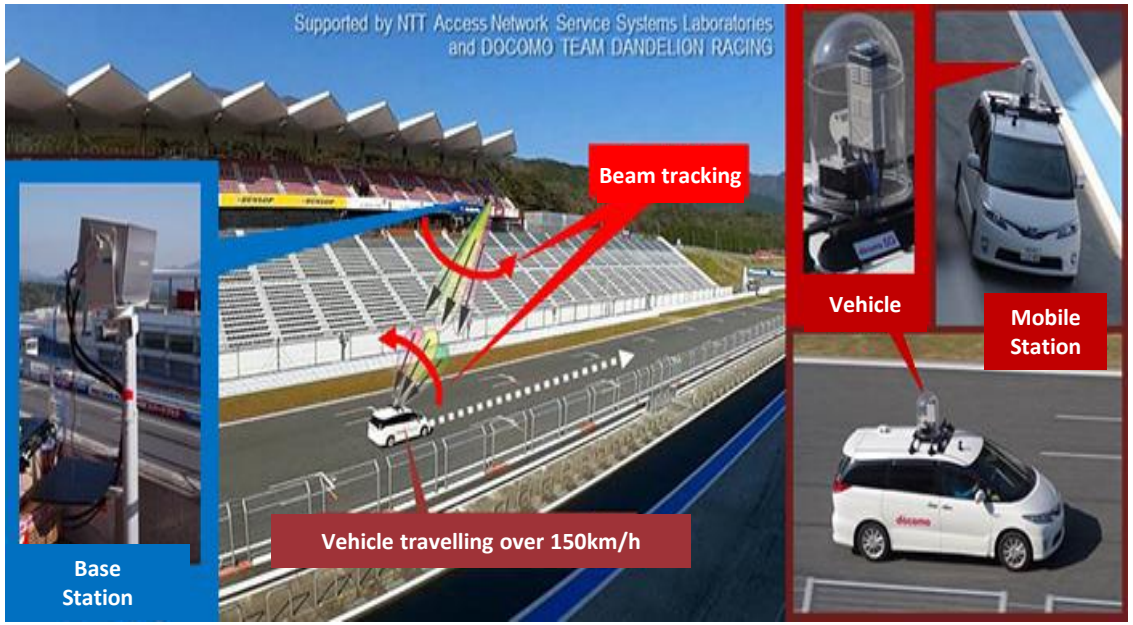
'KT 5G-SIG standard' satisfies the key requirements for 5G set by the ITU



Field Tests in Japan

Trial with Docomo (Nov., 2016, Fuji Speedway)

DOCOMO and Samsung have carried out a 5G test which achieved data rates of up to 2.5Gbps in a vehicle travelling at 150km/h. Transmissions were conducted using the 28GHz high-frequency band



http://www.telecompetitor.com/5g-development-moving-quickly-ntt-docomo-samsung-achieve-2-5-gbps-at-150-kmh/

Trial with KDDI (Feb., 2017, Tokyo)

KDDI and Samsung Successfully demonstrate 5G handover using 28GHz spectrum on a city highway in Tokyo.
The 5G handover was successfully carried out in a test divided into two scenarios:
First, a 5G device mounted on a vehicle that travelled at a speed limit of 60km/h drove between two 5G base stations on a metropolitan expressway.
The second scenario was designed to verify the characteristics and performance of the 28GHz spectrum in Line of Sight (LOS) and Non Line of Sight (NLOS) environments. In the LOS environment, the vehicle drove through the heart of the city and as a result, a maximum throughput of 3.7Gbps was achieved.

http://www.samsung.com/global/business/networks/insights/news/kddi-and-samsung-successfully-demonstrate-5g-handover-using-28ghz-spectrum

Field Tests outside Asia

Verizon Press Release (Feb., 2017)

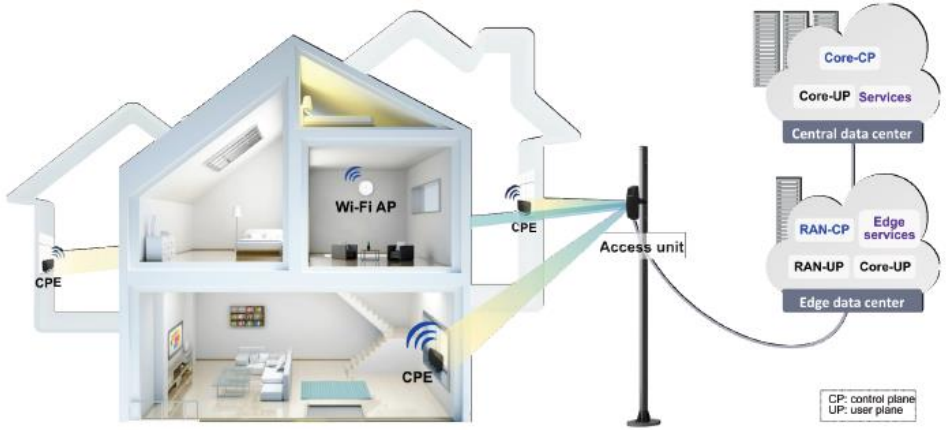
Verizon announced that it will begin testing its fifth-generation wireless service in 11 markets across the US, from rural areas to dense urban centers.
Verizon's 5G rollout will be based on the company's 5GTF specifications from last year and take place on a pre-commercial basis for pilot customers. While the goal of 5G service is to deliver dramatically improved mobile internet speeds over our current 4G standards.

http://www.androidauthority.com/verizon-5g-samsung-751503/

UK 5G-FWA Trial Arqiva (Feb., 2017, London)

Arqiva and Samsung to undertake first 5G Fixed Wireless Access trial in the UK.
Samsung's 5G Access Units (the base stations) will use high-frequency mm-wave spectrum and advanced technologies such as beam-forming, to provide high-density coverage and ultra-high-bandwidth connectivity. This gives 5G FWA considerable advantages over comparable FTTH or FTTB (Fibre-to-the-Home/Building) deployments in terms of service rollout times and the costs to both the service provider and the subscriber.

https://www.arqiva.com/news/press-releases/arqiva-and-samsung-to-undertake-first-5g-fixed-wireless-access-trial-in-the-uk/



Source: Samsung

Thank you