



**5G is Now,
from eMBB to Digital Society**

5G is Now, from Enhanced MBB to Digital Society

R15: A Milestone for Enhanced MBB Experience

R16: A Platform Serving All Industries



Phase I: eMBB

NR Framework

- Waveform
- Channel Coding
- Frame Structure
- Numerology
- Native Massive MIMO

Architecture

- UL&DL Decoupling
- CU-DU Split

uRLLC Baseline



Phase II: eMBB+uRLLC+mMTC



NR Improvement



Vertical Digitalization

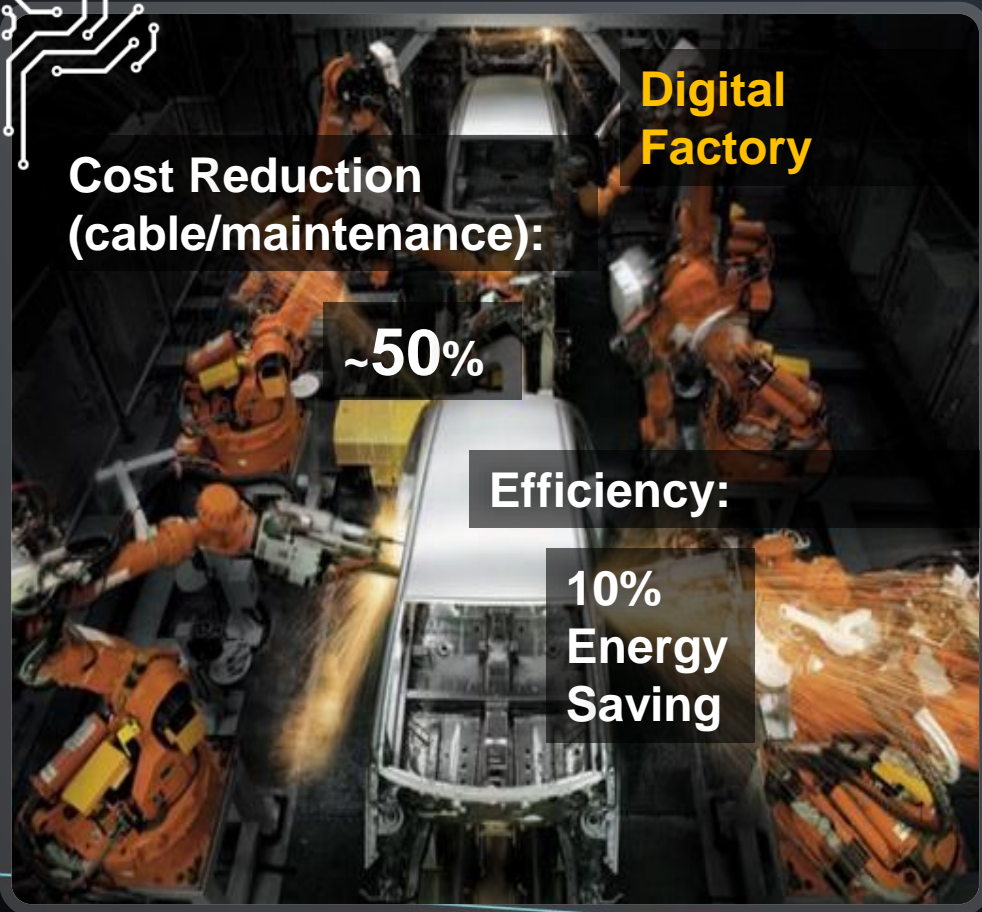


Spectrum

2018

2020

Connected Robots Will Enable Industry 4.0



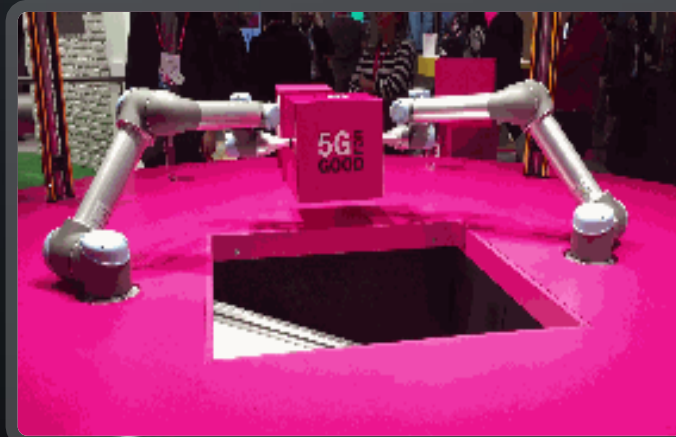
**Digital
Factory**

**Cost Reduction
(cable/maintenance):**

~50%

Efficiency:

**10%
Energy
Saving**



1ms

**End-2-End
Latency**

5G R15 Significantly Improves User Experience



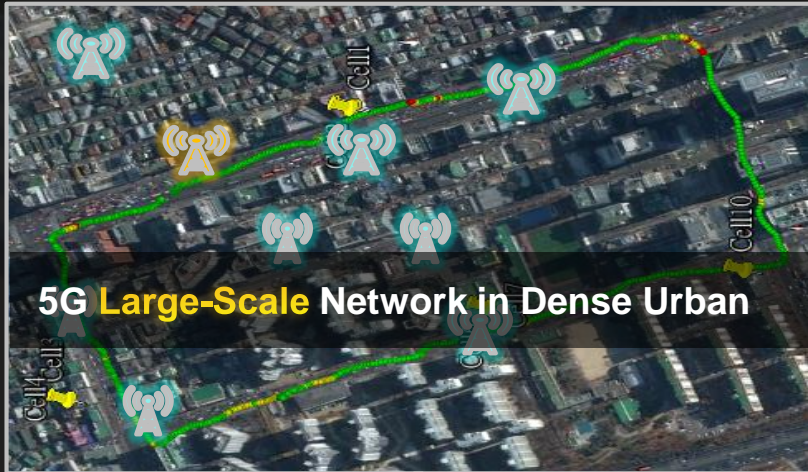
**Ultimate
User Experience**



**Ultra-High
Capacity**



**Improved
Investment Efficiency**



20Gbps

Peak Throughput

xGbps

Outdoor Everywhere

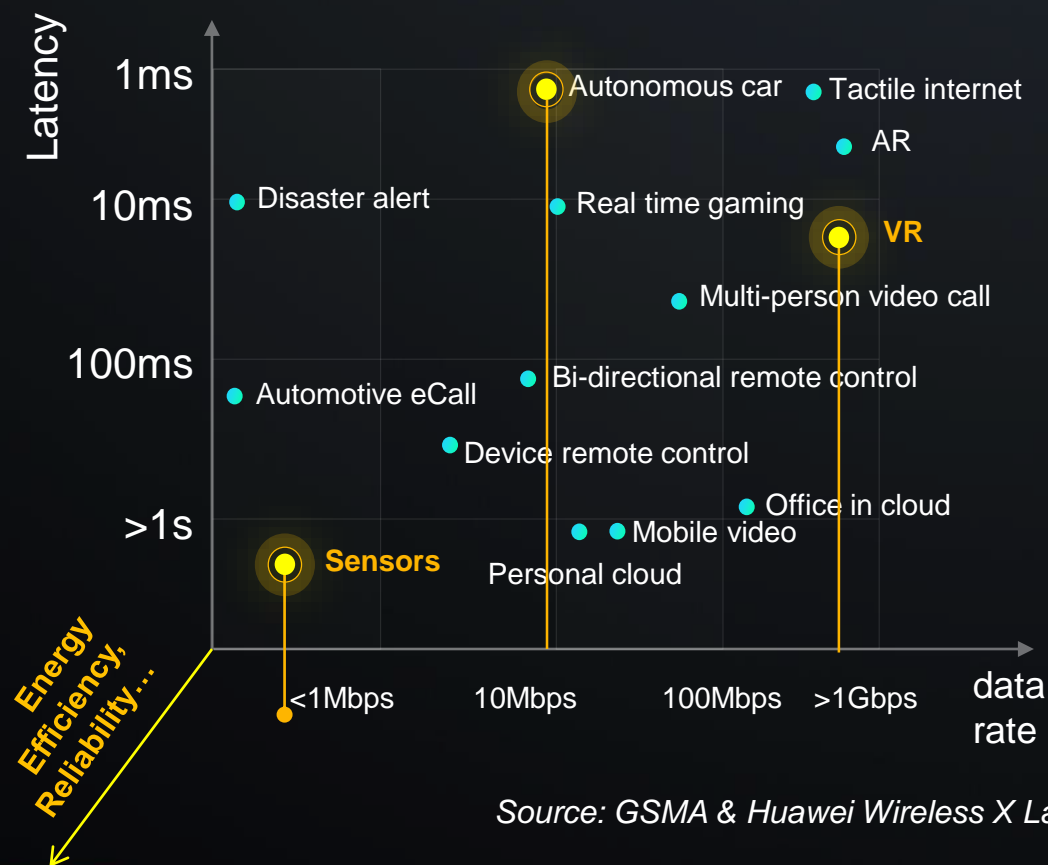
Nx100Mbps

Indoor Experience

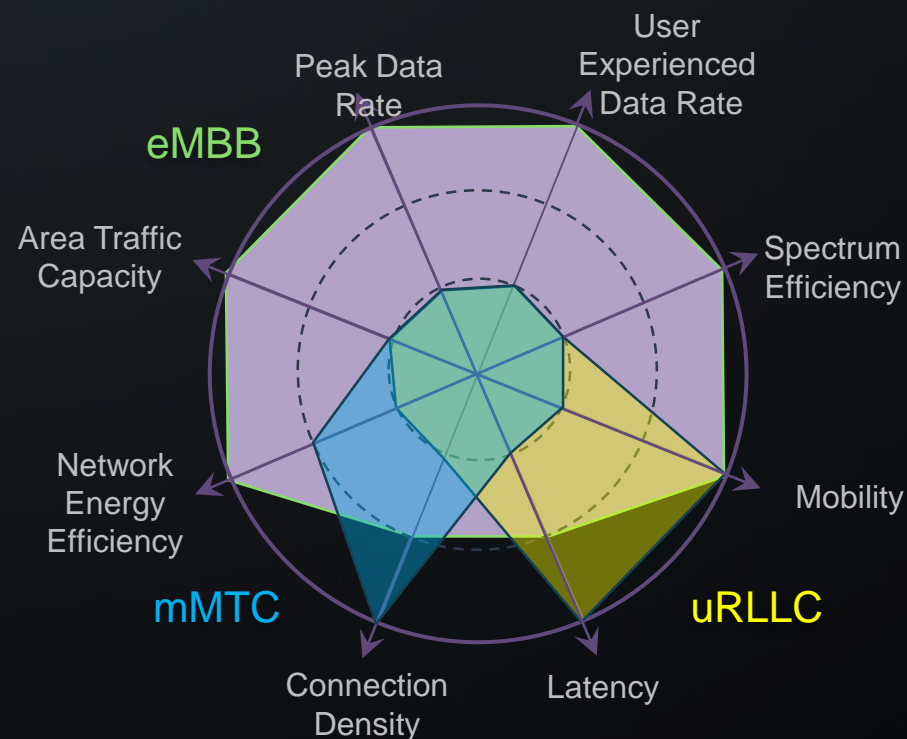


Huge Difference in Services & Network Requirements

Huge Difference of Service Experience



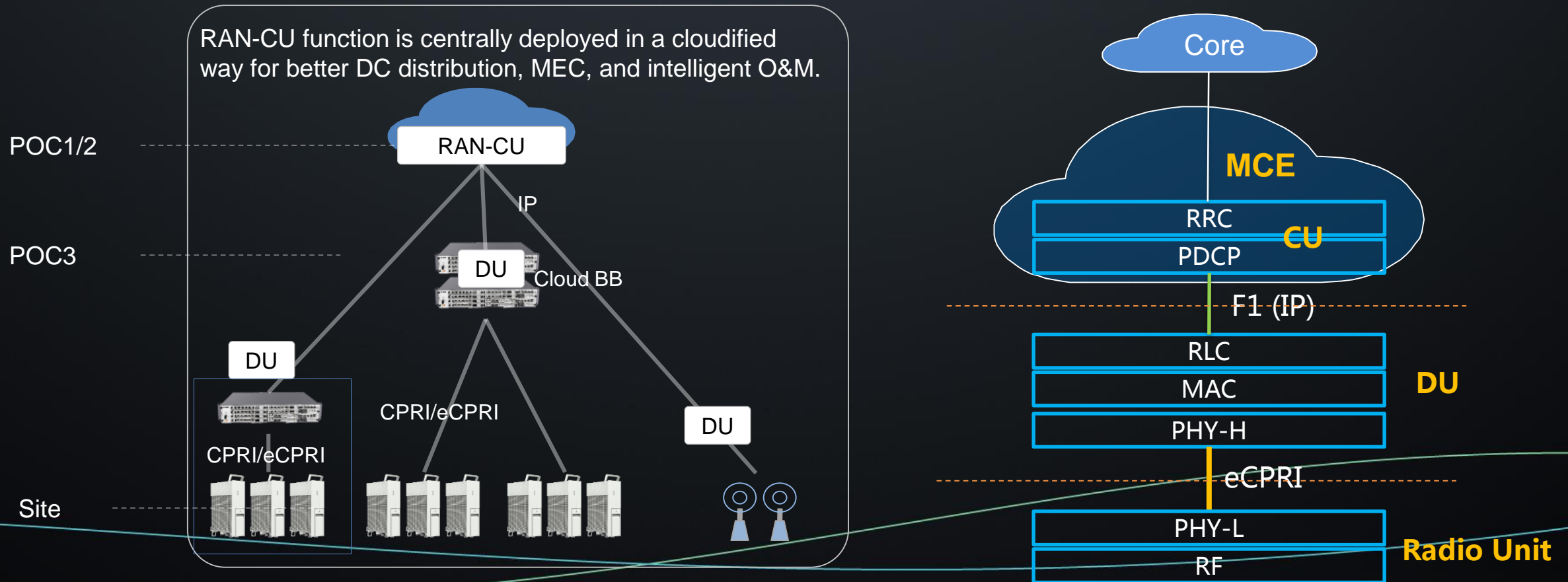
Huge Difference of Network Requirements



Build network with business requirement in phases, prepare capability for future.

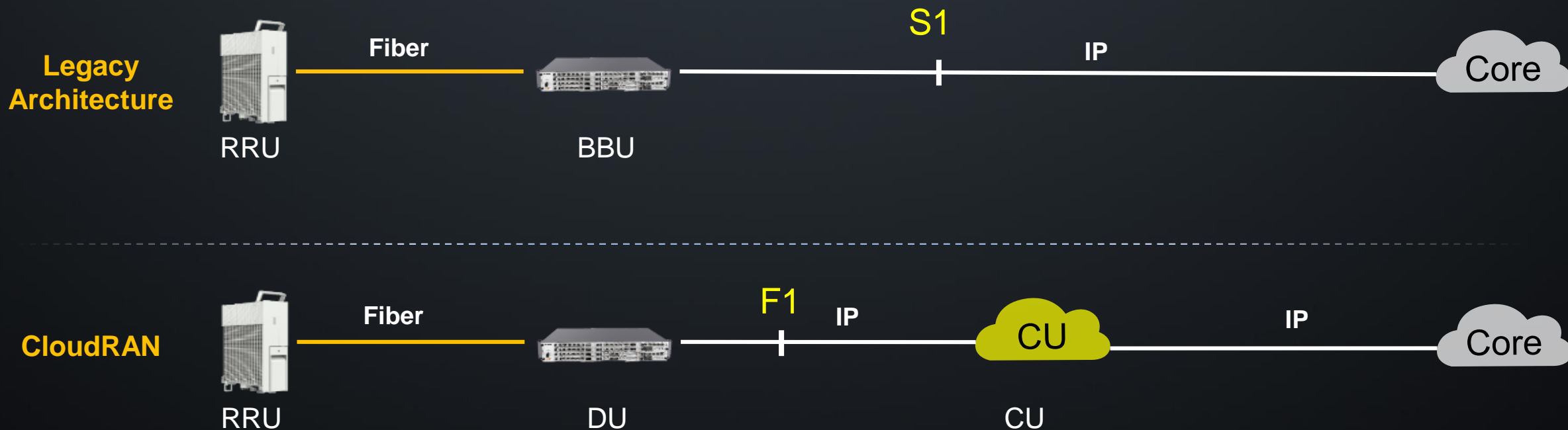
CU-DU Concept and its Architecture

- CU** The central unit processes some non-real-time protocols, such as packet data convergence protocol (PDCP) and radio resource control (RRC).
- DU** The distributed boards process real-time services, including scheduling, paging, broadcast, *RLC/MAC/PHY, and eX2/CUDU interface management.



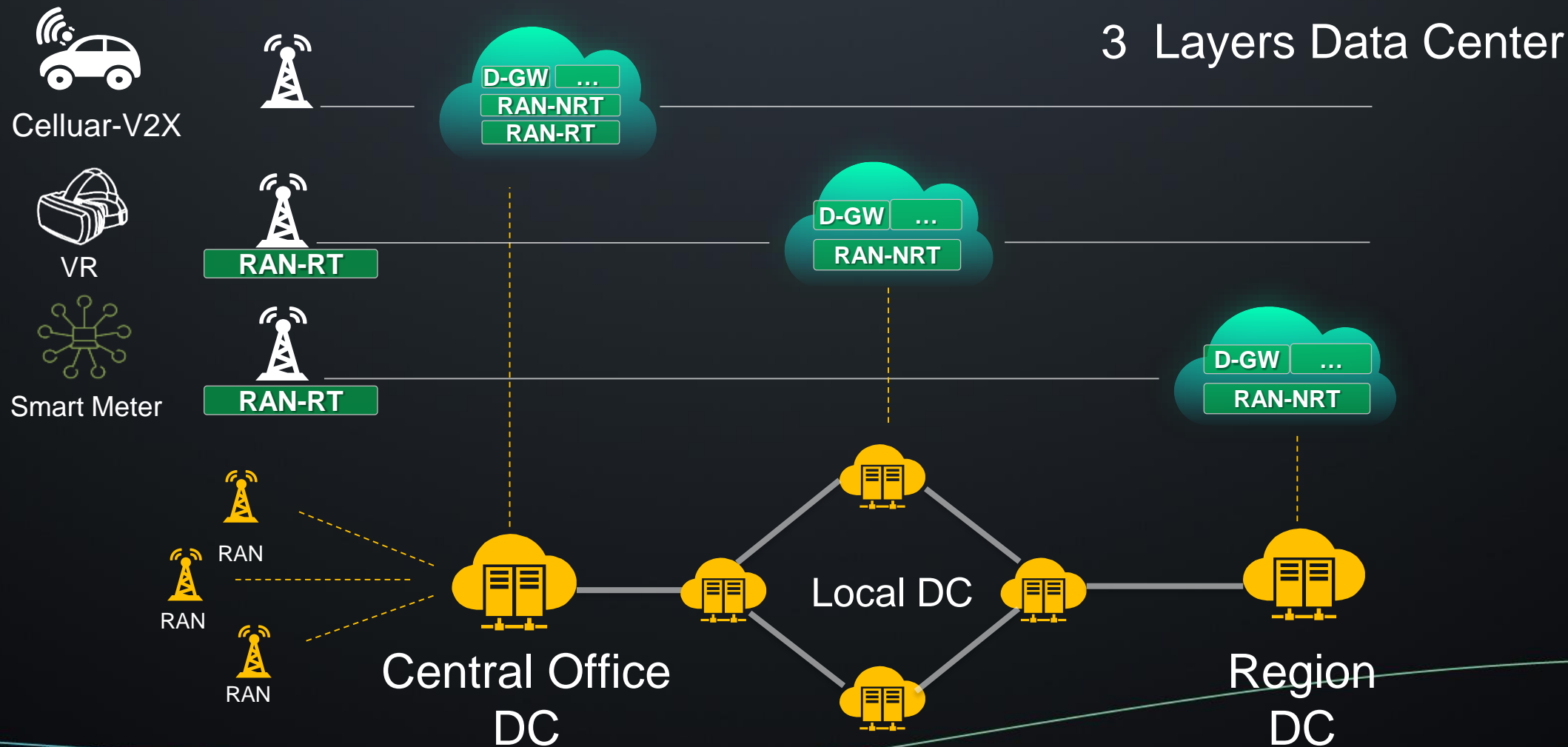
About F1 Interface

CloudRAN CU/DU split would allowed CU to be centralized.

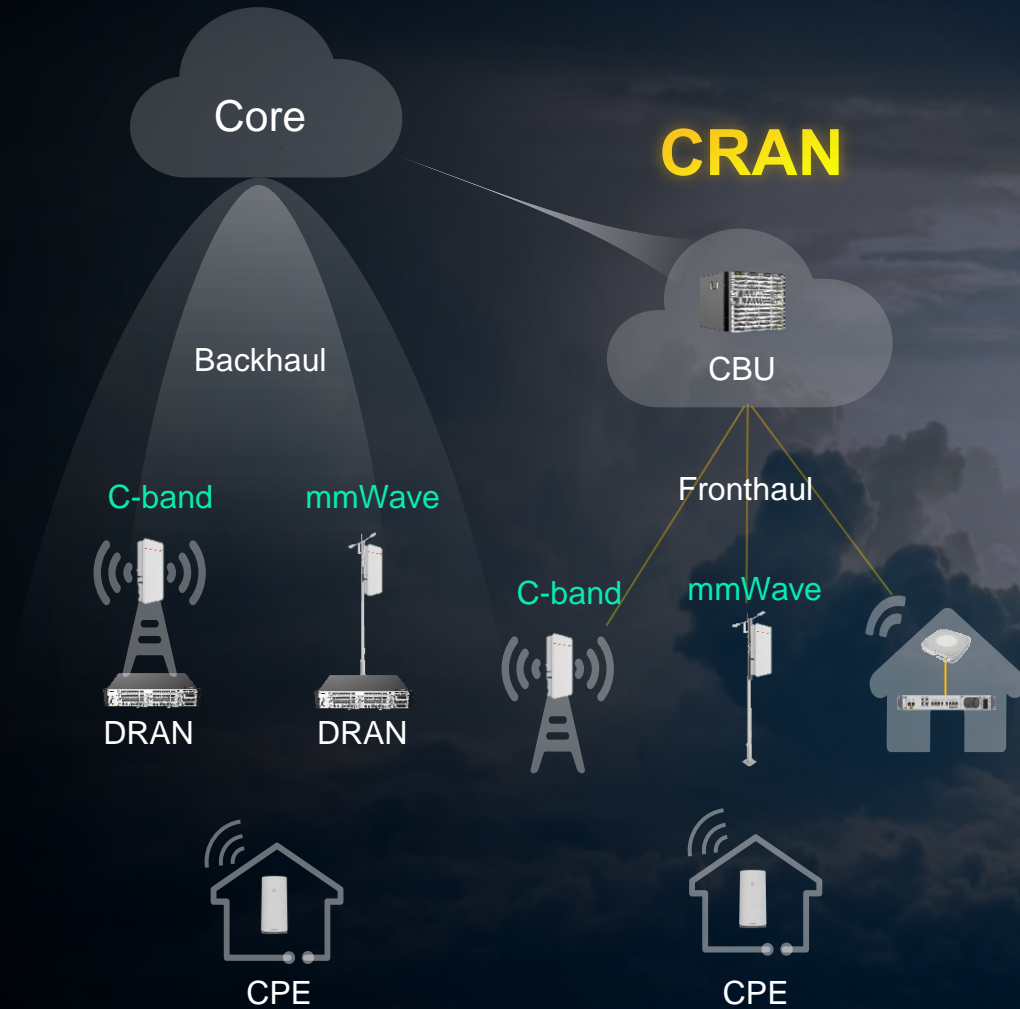


The transmission requirement of the F1 interface is equivalent to S1 interface

CU/DU Split Realize On Demand Deployment



RAN Architecture



OPEX Saving

Centralized Deployment



CAPEX Saving

Simplify Remote Sites
On-demand Sites Addition



Performance Improving

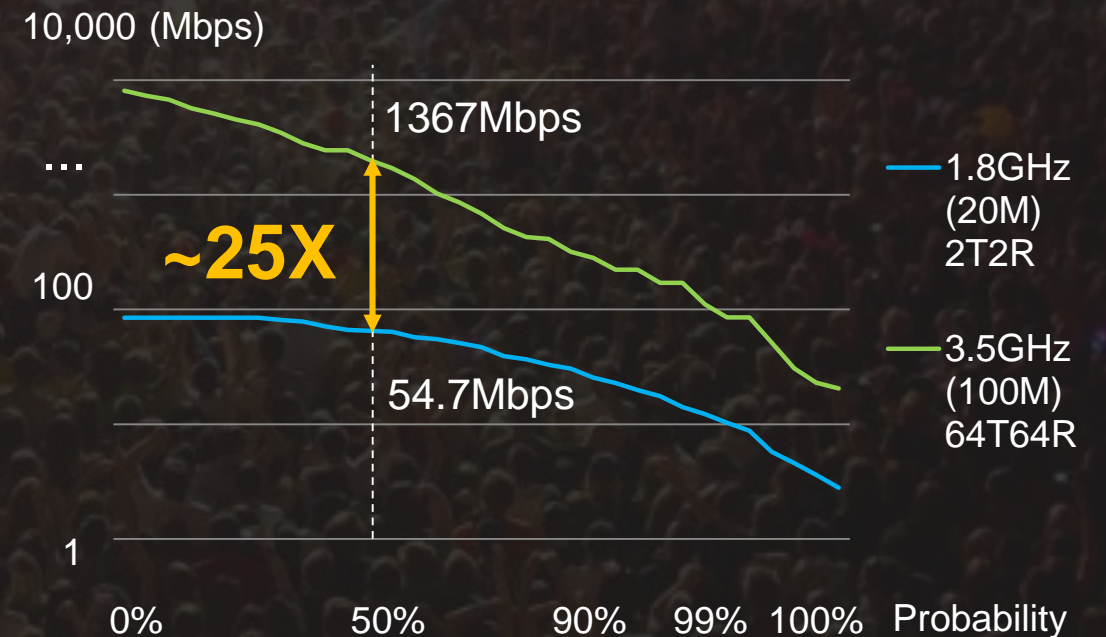
Inter-Site Coordination

Massive MIMO & Large BW Significantly Improve Cell Capacity

Massive MIMO & Large Bandwidth

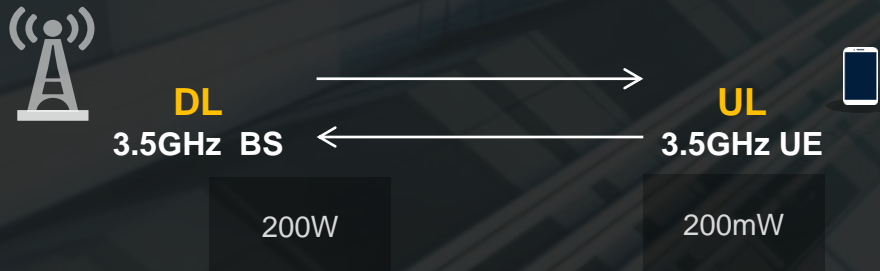


Cell Average DL Capacity Greatly Improved



UL & DL Decoupling Enables C-band Co-Site & Co-Coverage

C-band UL Coverage & Experience Limitation



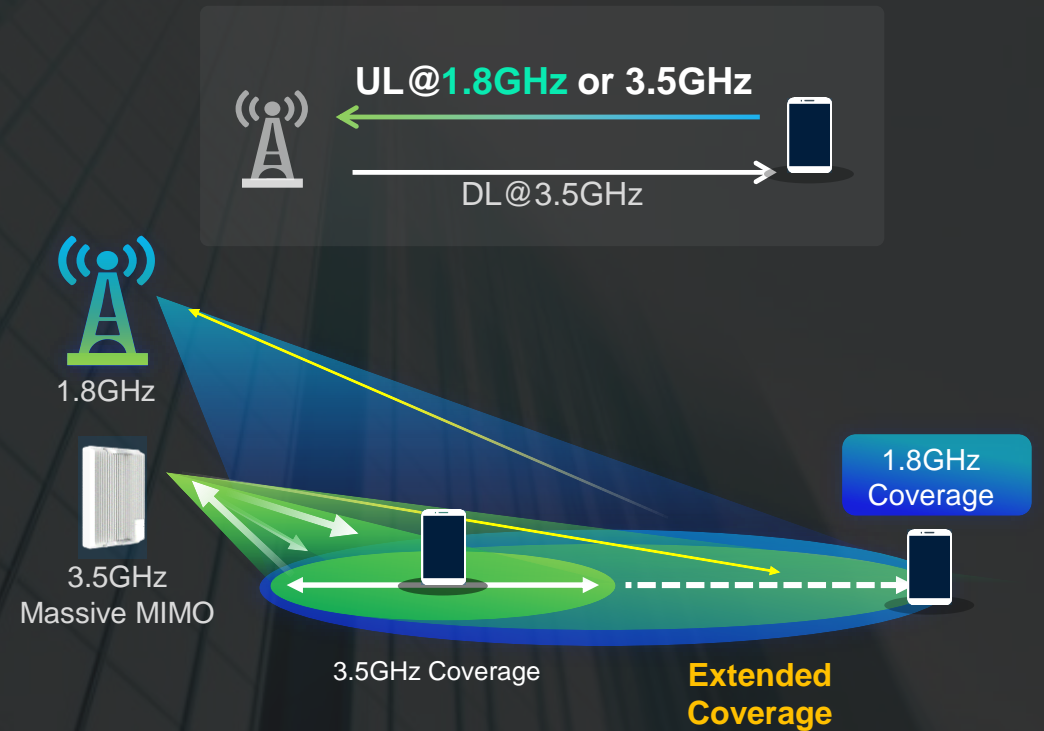
Tx Power

Gap
~1000X

DL: UL TS Ratio

~4X

UL & DL Decoupling to Extend C-Band Coverage

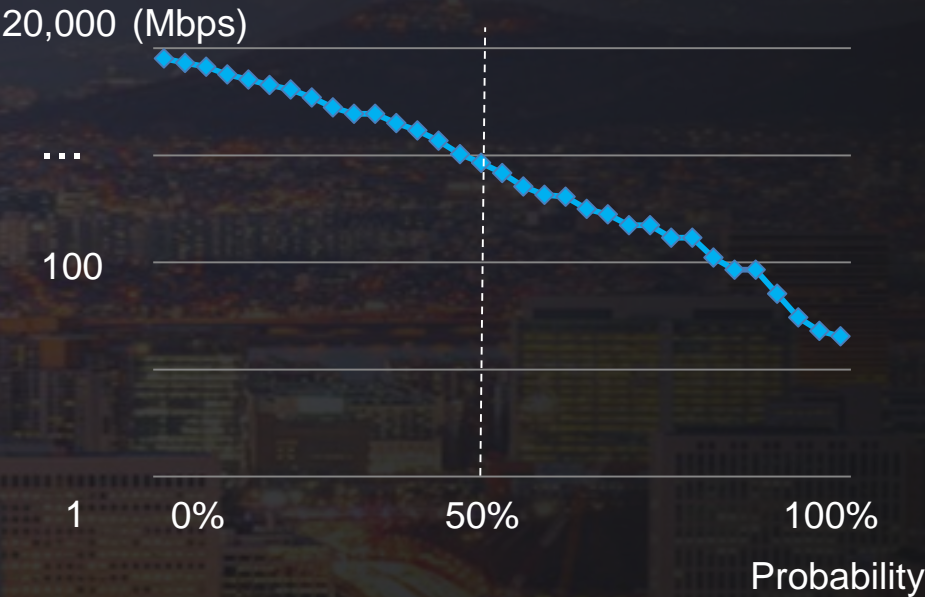


Live Demo of Massive MIMO Shows Huge Increase in Cell Capacity

Band	3.5GHz
BS Antennas	64T64R
Bandwidth	100MHz
UE Antennas	2T4R
UE	16 UEs



11.26 Gbps
Average DL Cell Capacity



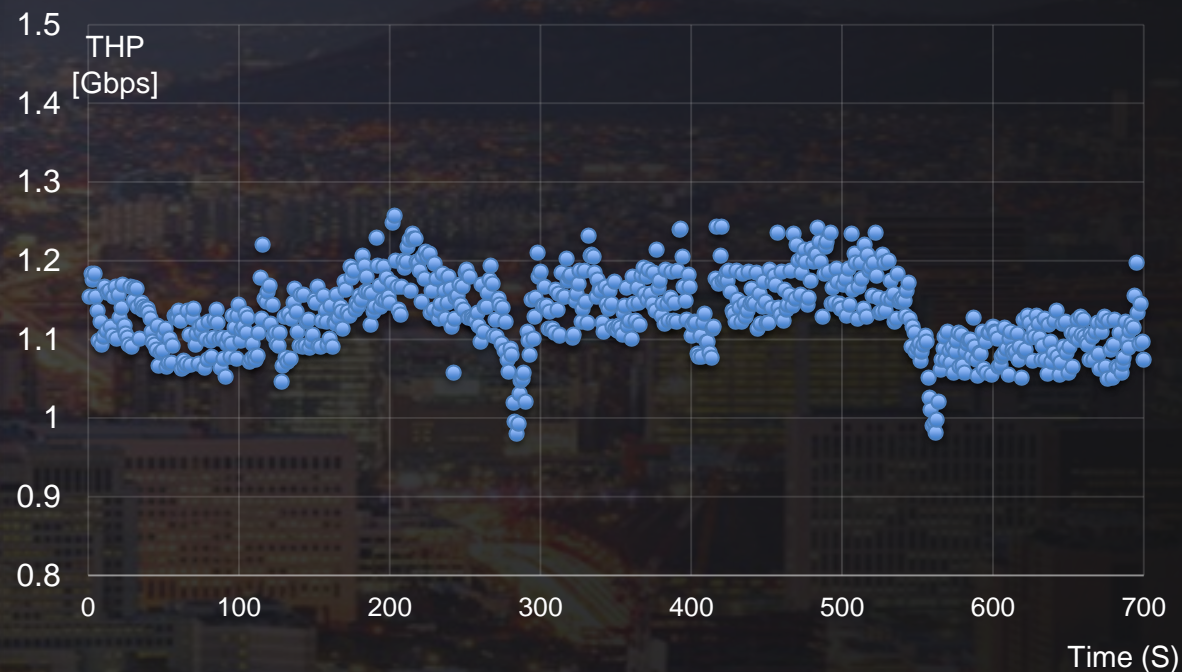
*Trial in Shanghai, China

Huawei 3D-MIMO Makes xGbps Outdoor Experience Possible

Band	3.5GHz
BS Antennas	64T64R
Bandwidth	100MHz
UE Antennas	2T4R



>1Gbps
User Experience @ C-Band

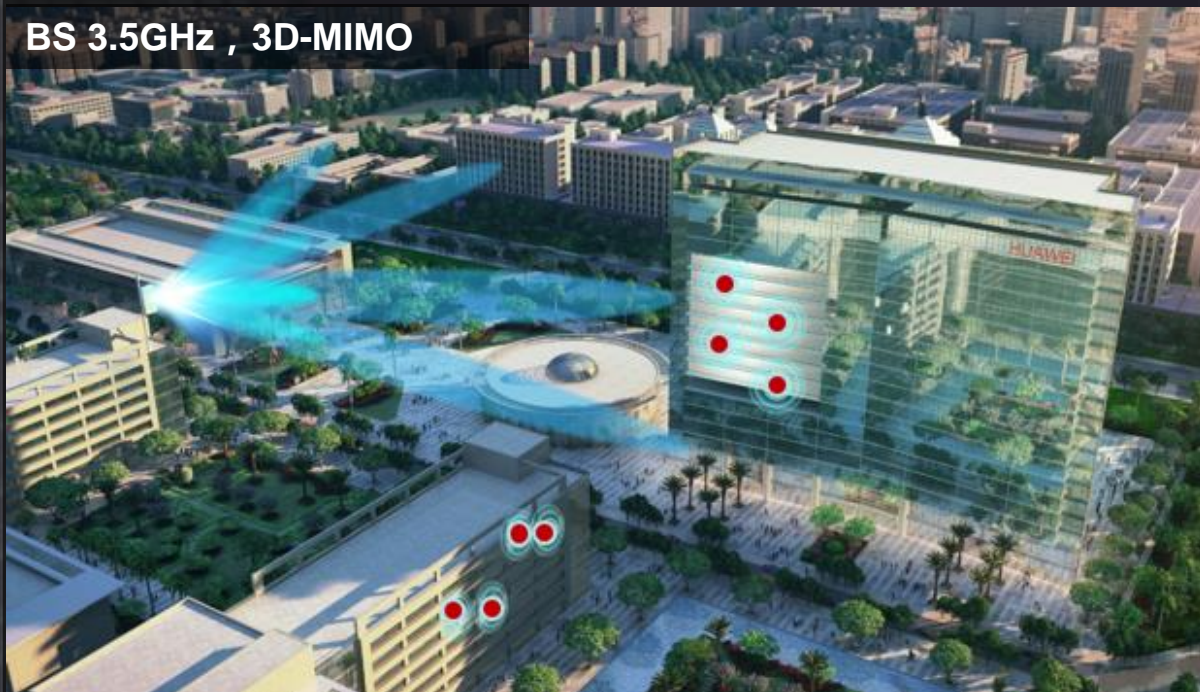



*Trial in Shenzhen, China, April, 2018

Huawei 3D-MIMO Enables Hundreds of Mbps Indoor Experience

Outdoor to Indoor Trial in Dense Urban Areas

BS 3.5GHz , 3D-MIMO



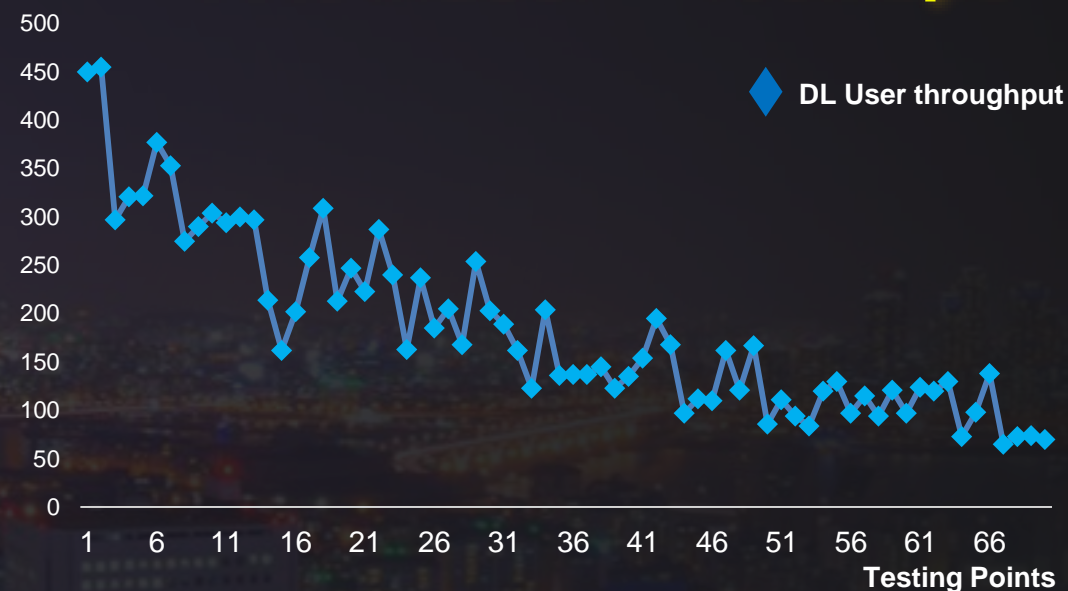
 CPE Spots in the Buildings

**Trial in Shenzhen, China, April, 2018*

Hundreds of Mbps Indoor Anytime Anywhere

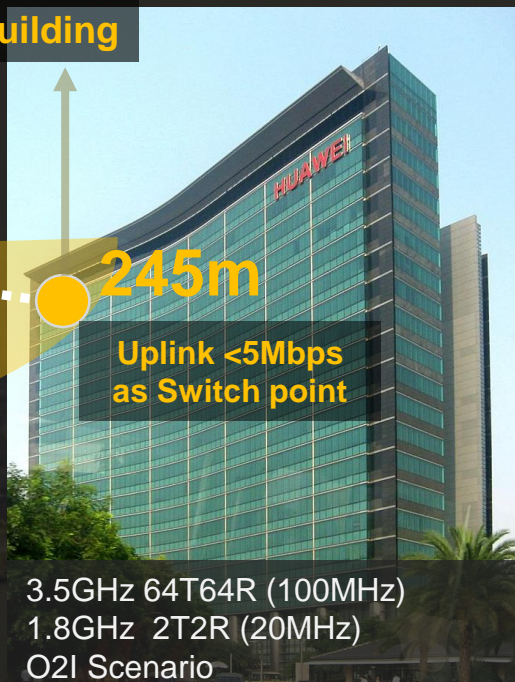
DL Speed
[Mbps]

95% indoor > 100Mbps

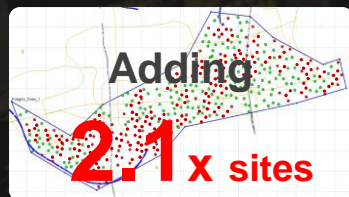


UL & DL Decoupling Live Demo Shows ~11dB Gain in C-Band Coverage

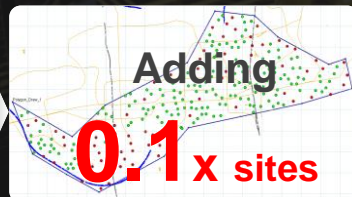
Penetration Loss across the Building



UL&DL Decoupling Reduces Site Deployment Cost

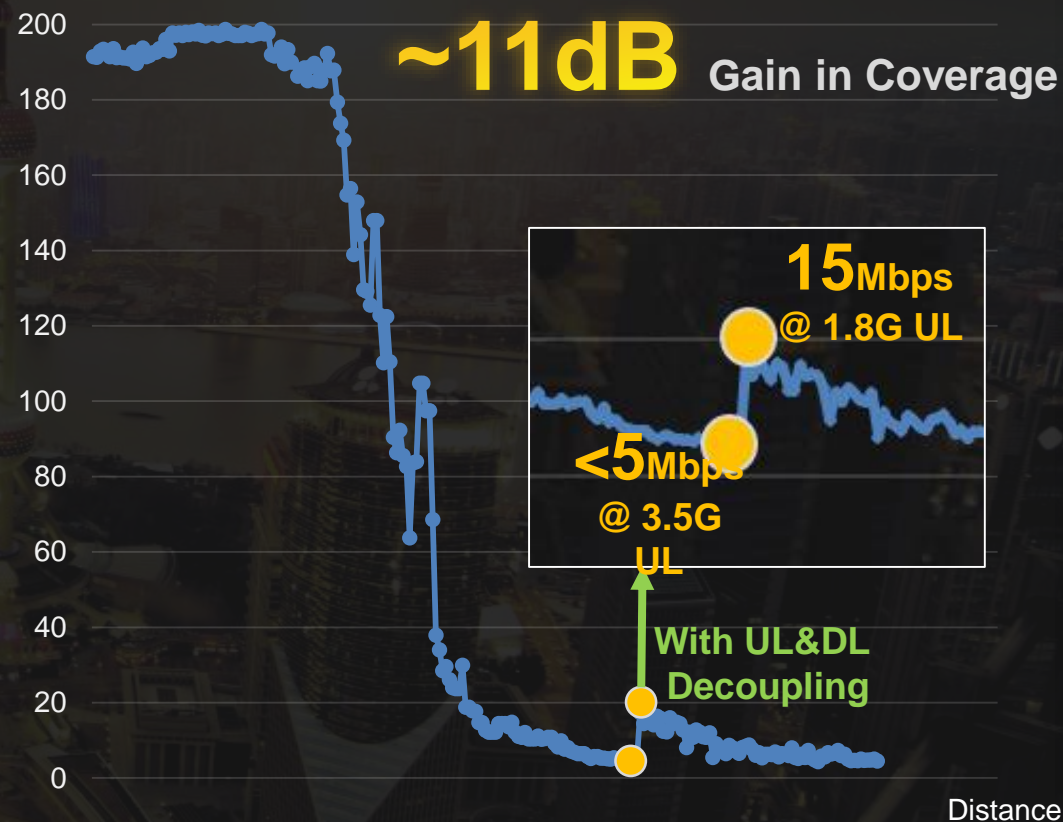


No Decoupling



Decoupling

UL&DL Decoupling Extends 5G C-Band Coverage



*Trial in Shenzhen, China, April, 2018

Huawei Clear Device Roadmap Promotes 5G Industry Advancement

**World 1st
5G Commercial CPE**



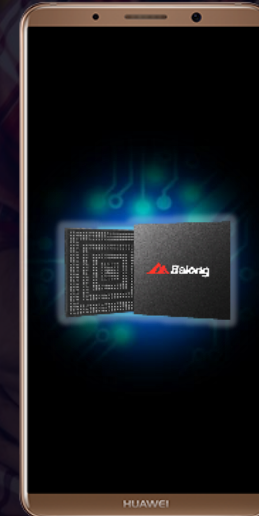
2018

Mobile Wi-Fi



Q2 2019

5G Smartphone



H2 2019

5G, Keep Innovation for Industry Digitalization

Cloud VR



Connected Car



Wireless Factory



Digital Sky



Wireless eHealth



Creating New Ecosystem with

283 Partners

49 Projects

A silhouette of a person in a running pose is centered in the image. The background is a dramatic sunset or sunrise sky with warm orange and yellow hues near the horizon, transitioning to darker blue and purple tones at the top. The person's shadow is cast onto the ground below them.

5G is Now, the Future Awaits

Thank you!

 | 5G IS NOW