

Bringing 5G into Reality

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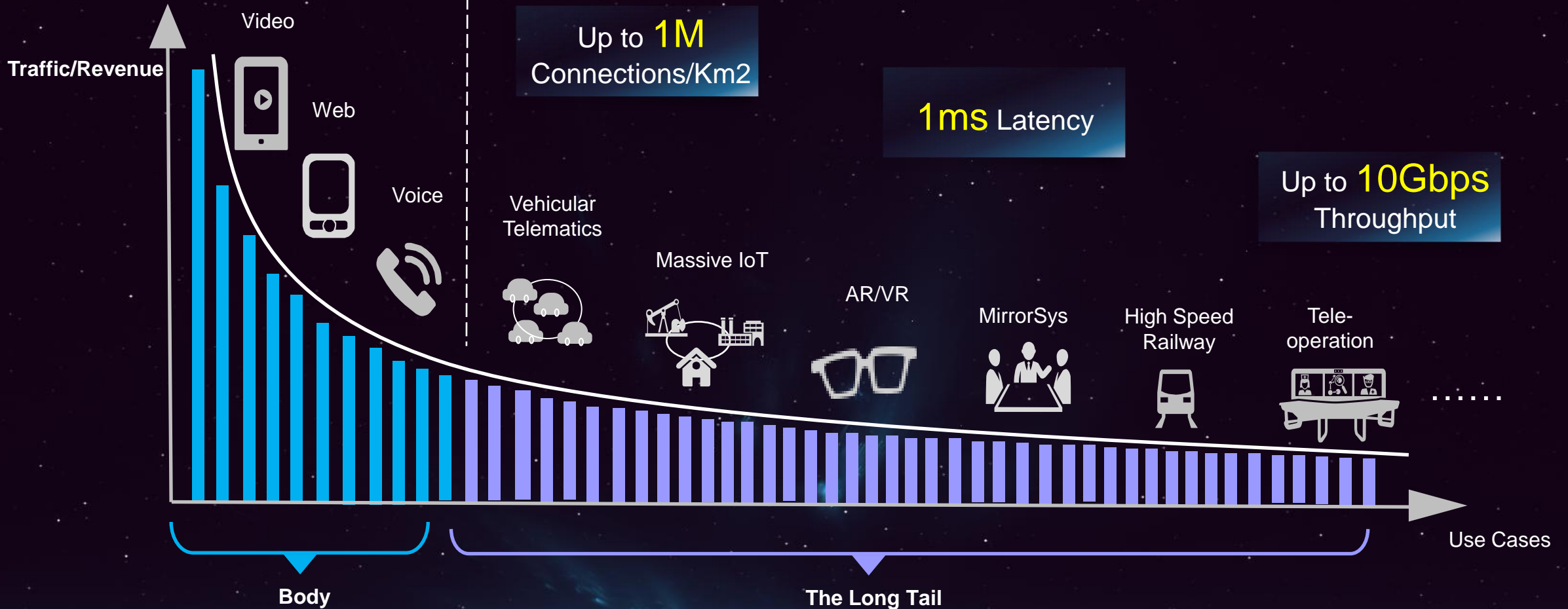
Need Network to Support Higher Productivity & Newer Services



Reduce
Cost/GB



Long Tail Use Cases Require Varying Network Capabilities



Discussions During Deployment of 5G Network

5G
Target Network



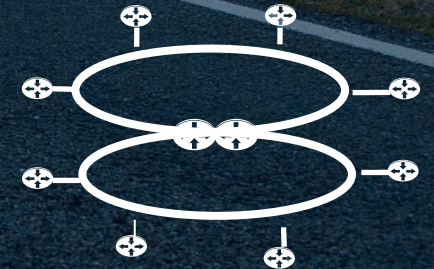
Spectrum Strategy



**Site
Configuration**



**Cloud
Architecture**



Bearer Network

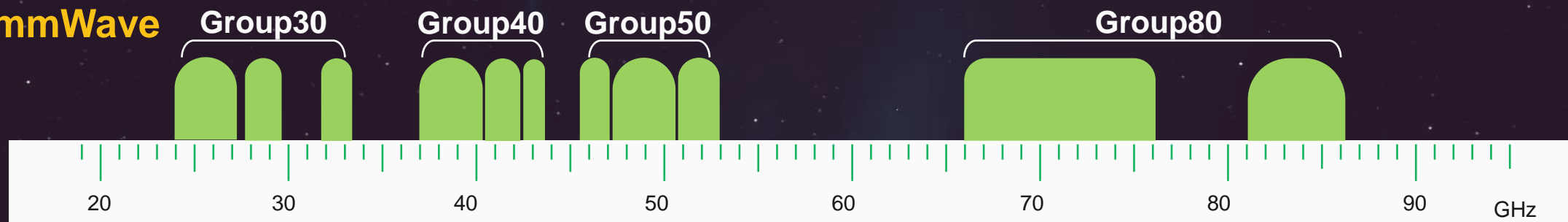
C-Band & Group 30/40 to be Global Harmonized Bands

Sub6G

Frequencies (MHz)	Region 1				Region 2		Region 3
	EU	Africa	Arab	C.I.S	N.A	L.A	Asia
3400-3600	Y	Y	Y	Y	Y	Y	Y

C-band to be a **global 5G Band** with at least 200M in Sub6GHz.

mmWave



Support
26GHz



Support
28/37/39/66GHz



Support
28/38GHz



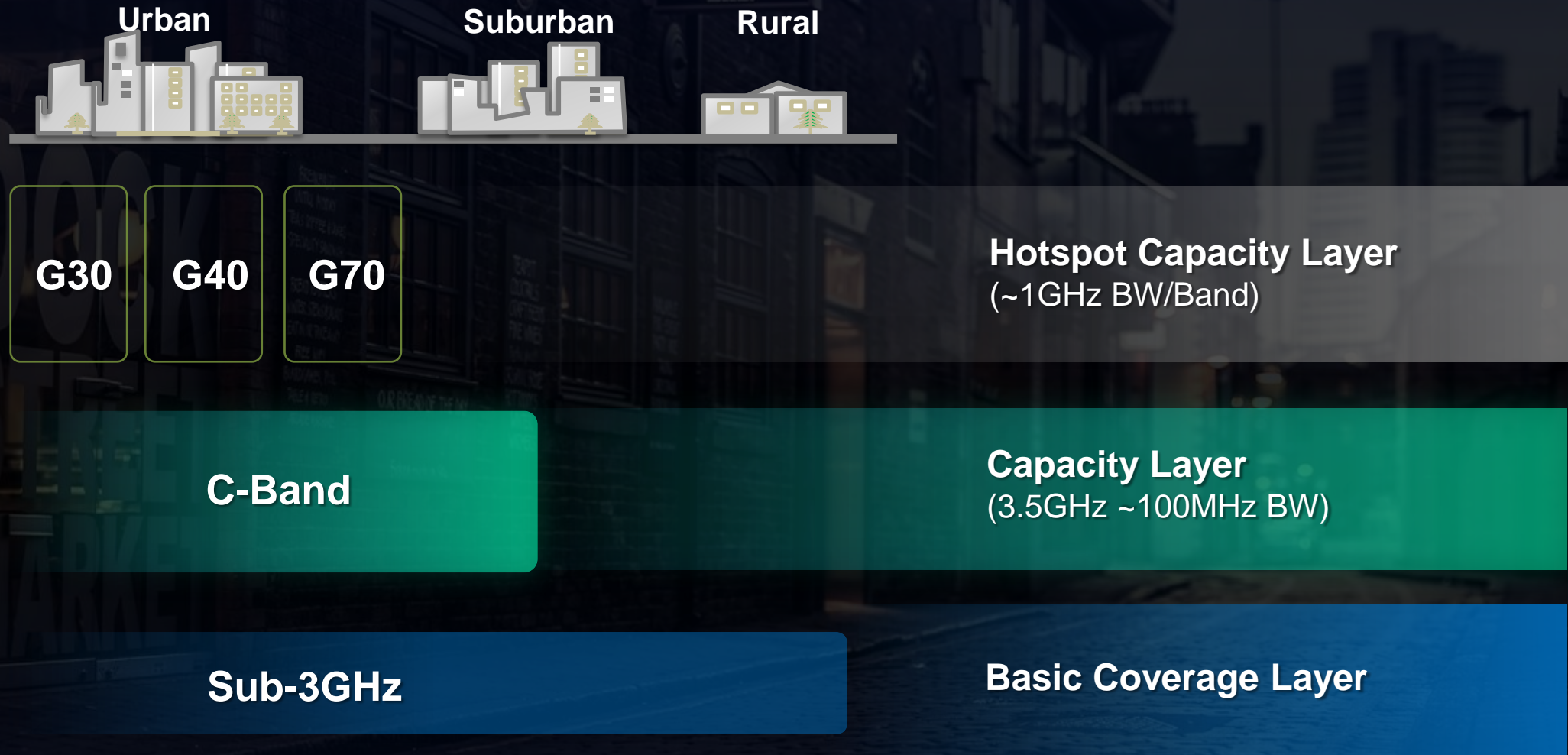
Support
30~50GHz

Group 30/40 Supported by **Europe/U.S./Japan/Korea**



Candidates of WRC-19

Role of Different Bands in a 5G network



UL & DL Decoupling for Early 5G Deployment

Extend C-Band Coverage

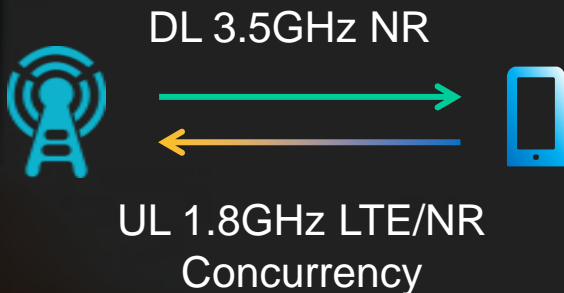


3.5GHz UL+DL

3.5GHz DL
+ 1.8GHz UL

Extended Coverage

Improve Utilization of Legacy Spectrum

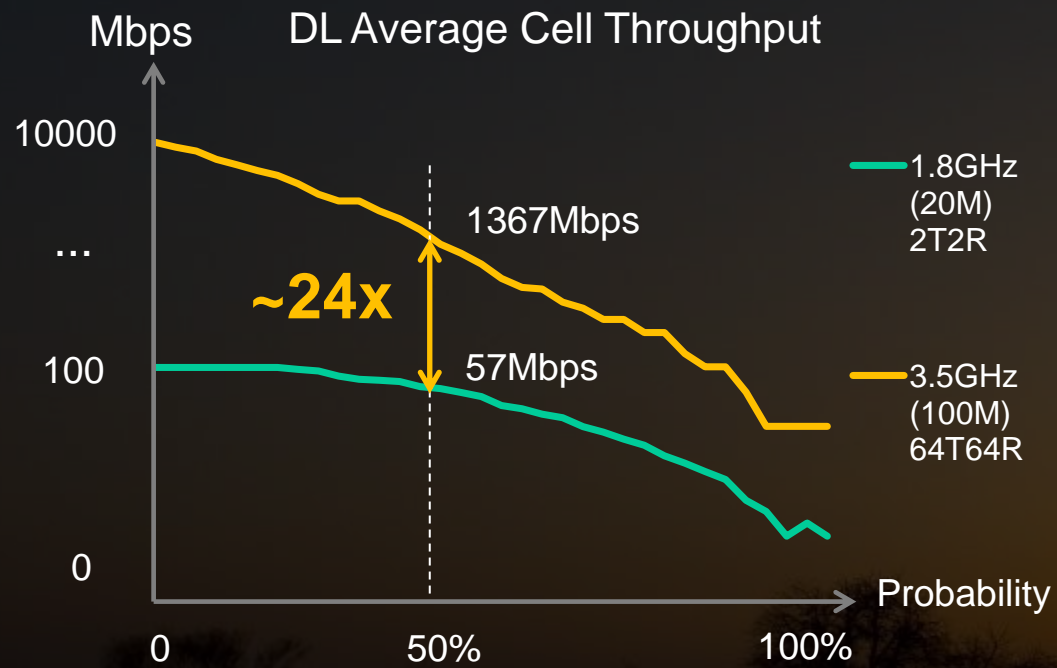


Spectrum

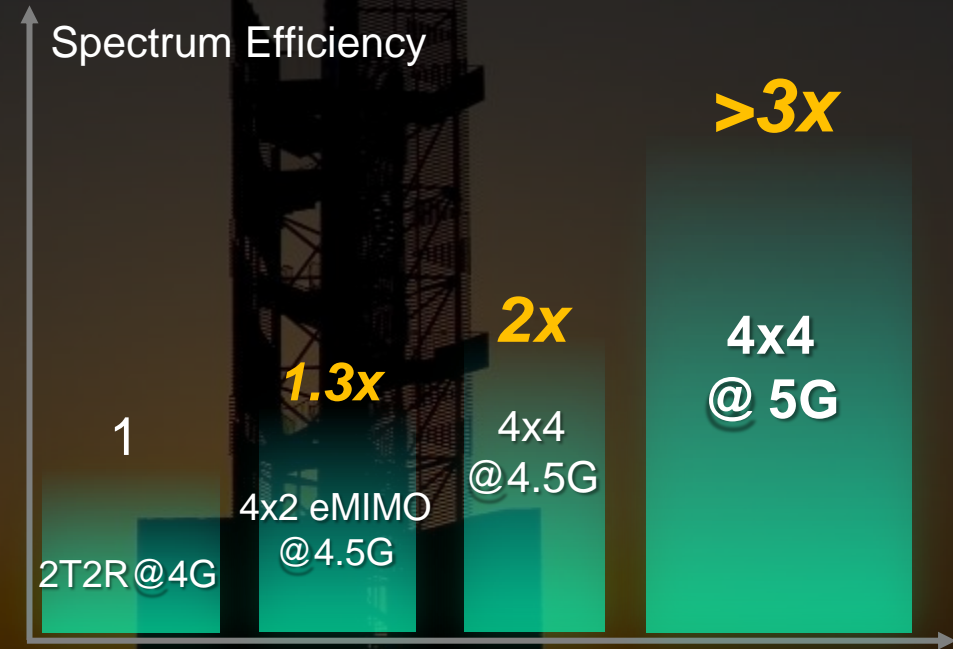


Multi-Antenna Significantly Improve Capacity in Sub-6GHz

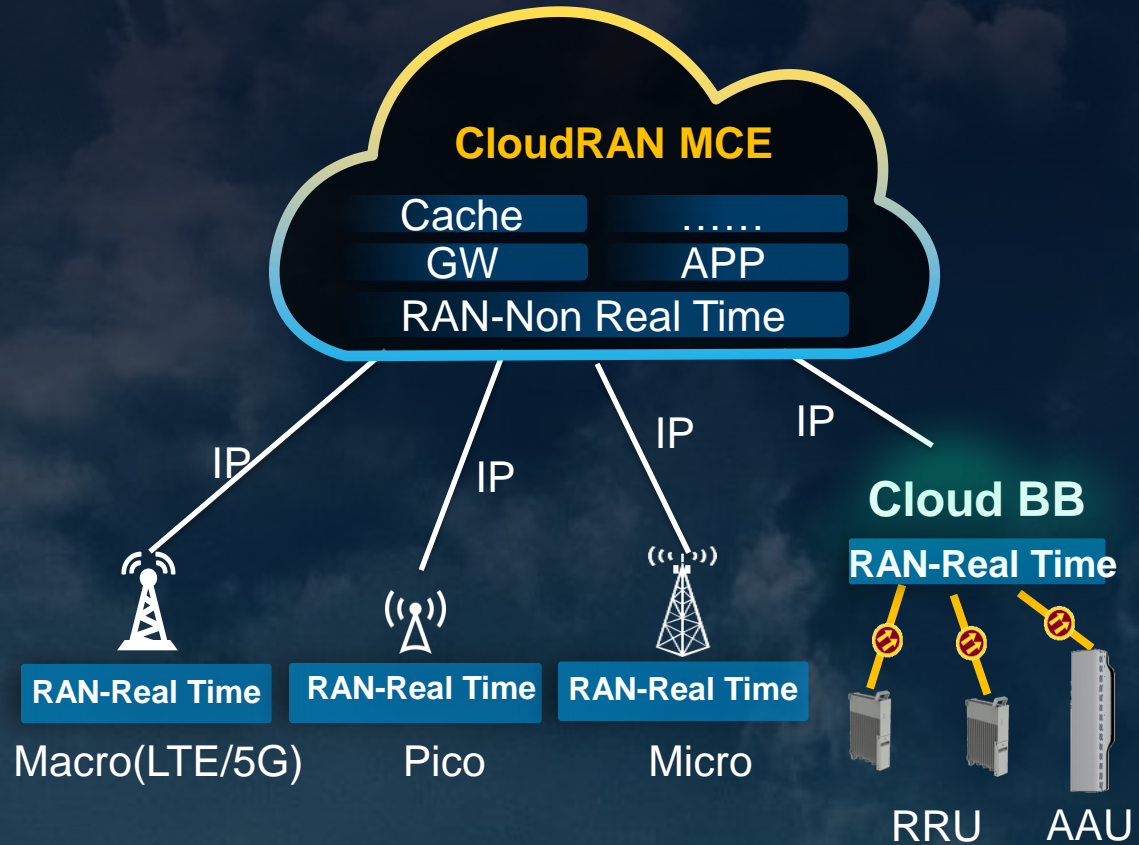
C-Band + M-MIMO Boost Capacity with Affordable Complexity



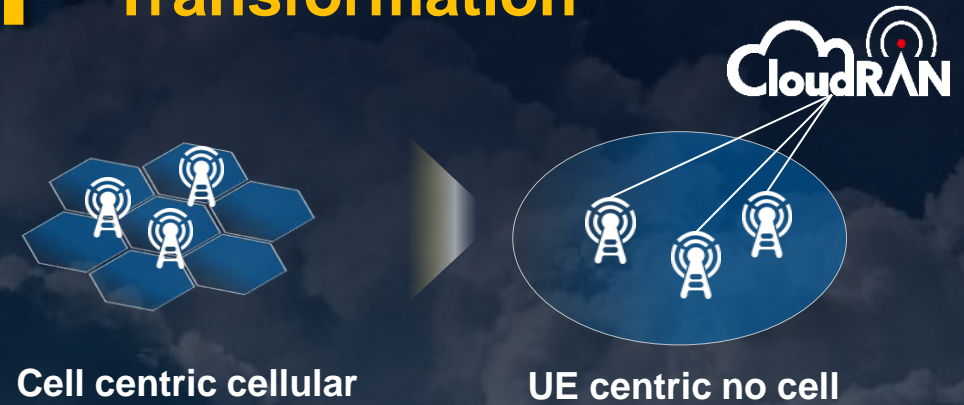
Start with 4T4R within Sub-3GHz FDD



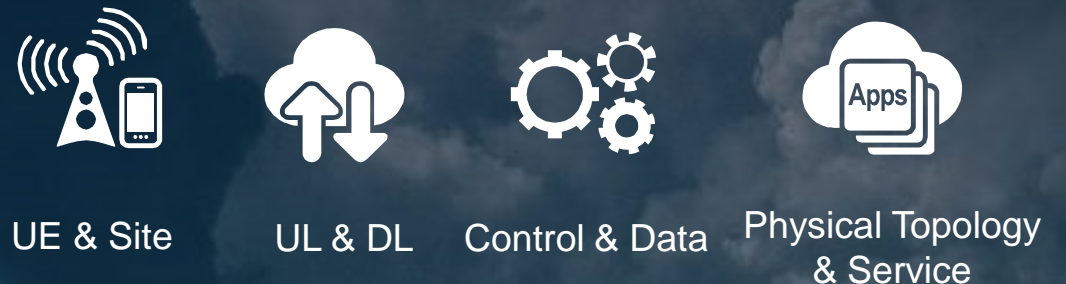
From SingleRAN to CloudRAN, Essential to Prepare for 5G



1 Transformation



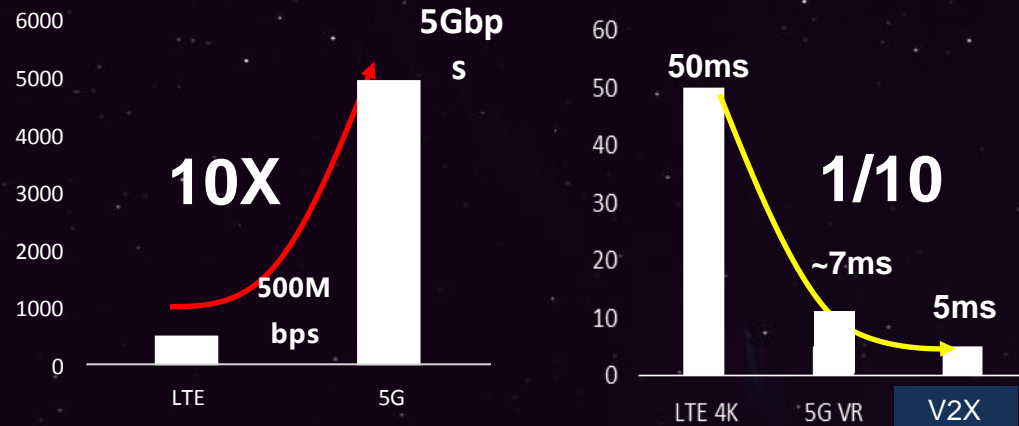
4 Decoupling



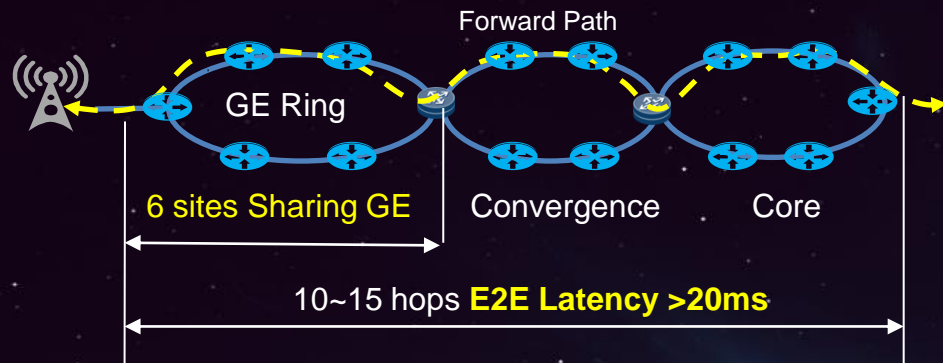
Making Bearer Network Ready for 5G

Low latency & High throughput Challenges

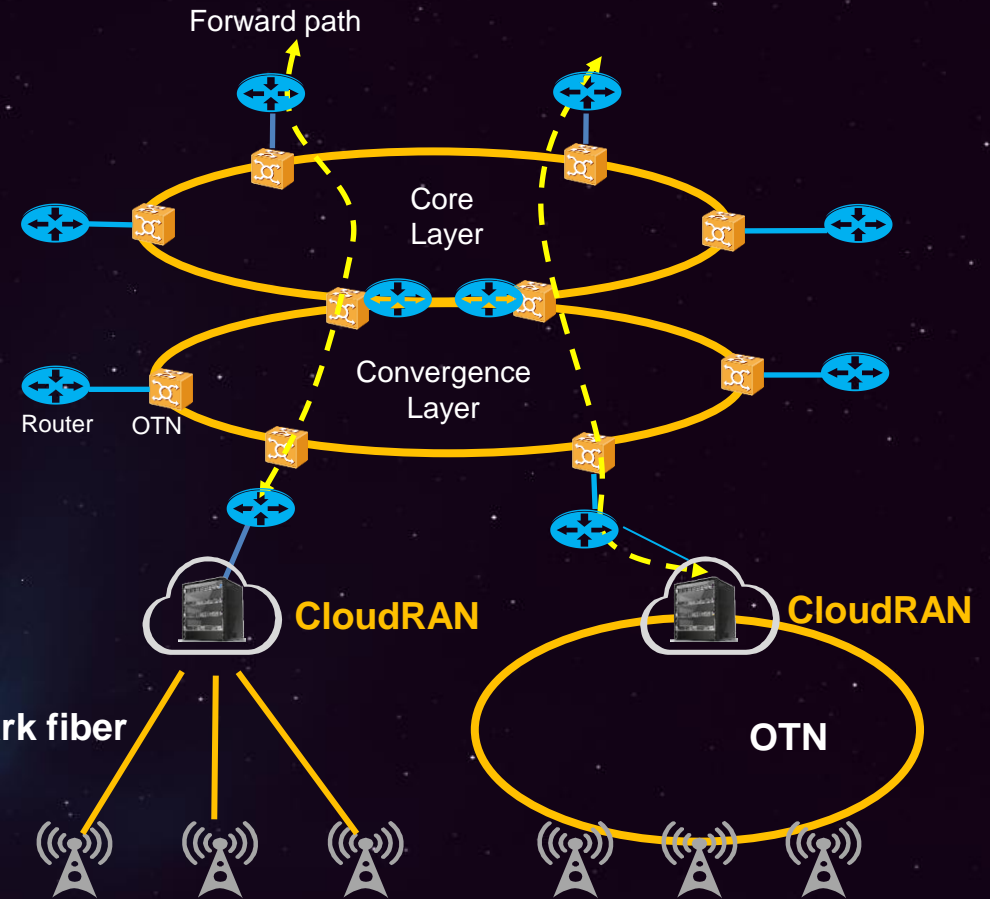
5G Requirement: Single sector **>5Gbps** , Latency **<5ms**



- Currently : Limited bandwidth, High Latency



5G Transport: 3 Hops & 100G WDM in Metro



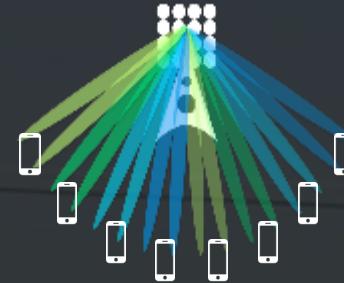
Joint Efforts to Bring 5G into Reality

C-band



- **10+Gbps** @200MHz BW
- 3D Beamforming
- **26 Layers**

28GHz



- **40+Gbps** @1GHz BW
- 8 Users
- **16 Layers**

C-band & 28GHz Dual-Connectivity



- **5Gbps+20Gbps**
- 8 + 8 Layers

C-band & 28GHz Mobility



- Inter-cell & Intra-cell
- **7 Gbps @ 300m** for 28GHz
- **600MHz @ 1km** for C-Band
- 50 km/h



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Take away: Bringing 5G Into Reality

- C-Band & Group 30/40 to be among first set of Global 5G Bands
- UL & DL Decoupling Enable C-Band NR to Co-Site with 1.8GHz LTE
- Massive MIMO on C-Band, 4T4R on Sub-3GHz Band
- CloudRAN is Essential to Prepare the Network for 5G Deployment
- Ultra Bandwidth & Low Latency Bearer Network is Essential for 5G



Keep on Exploring Far and Wide On 5G journey

Thank You

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