Outlook on 5G:
Network Transformation & Key challenges

Network Planning & Strategy, TRUE Corporation

30 May 2018

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- Outlook on 5G Services.
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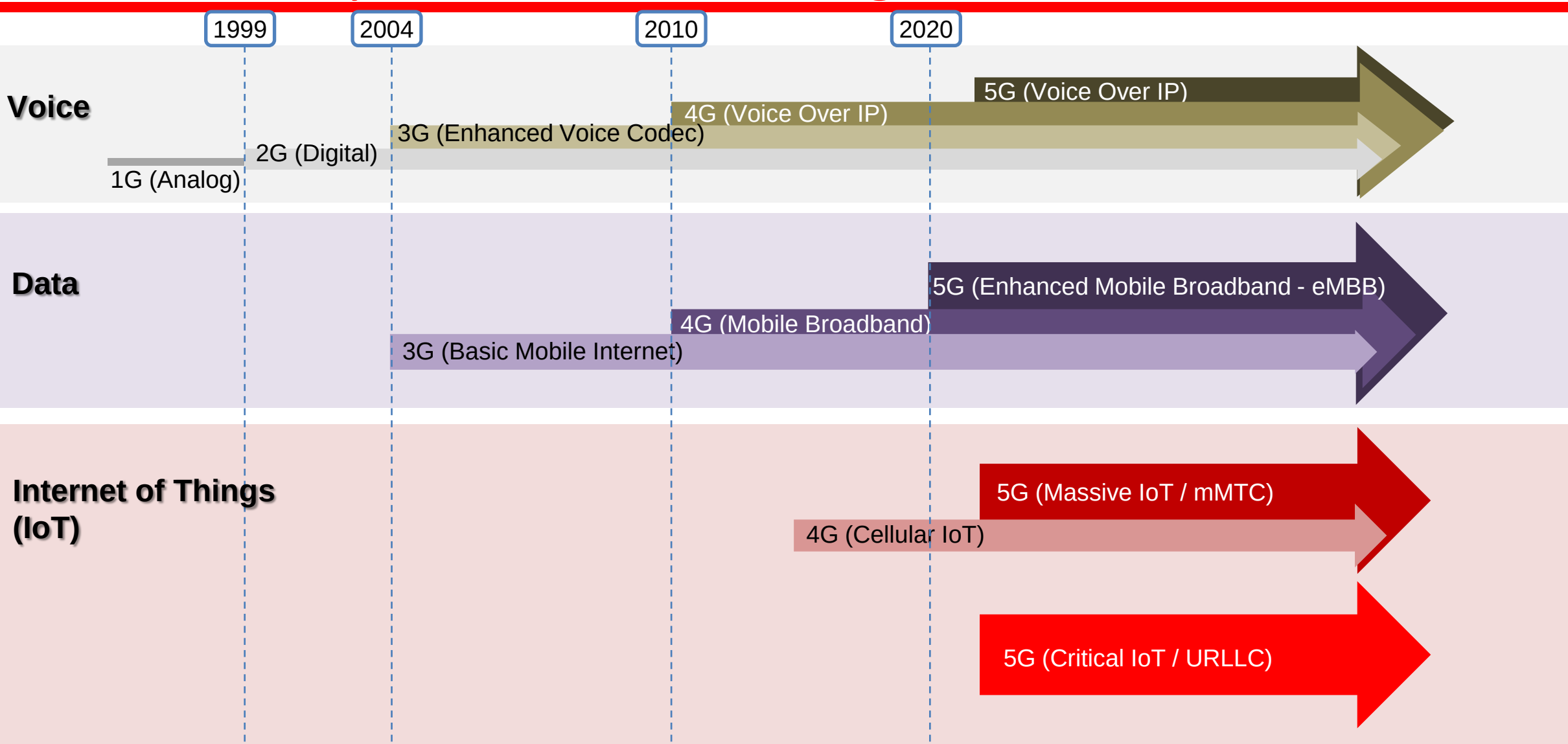
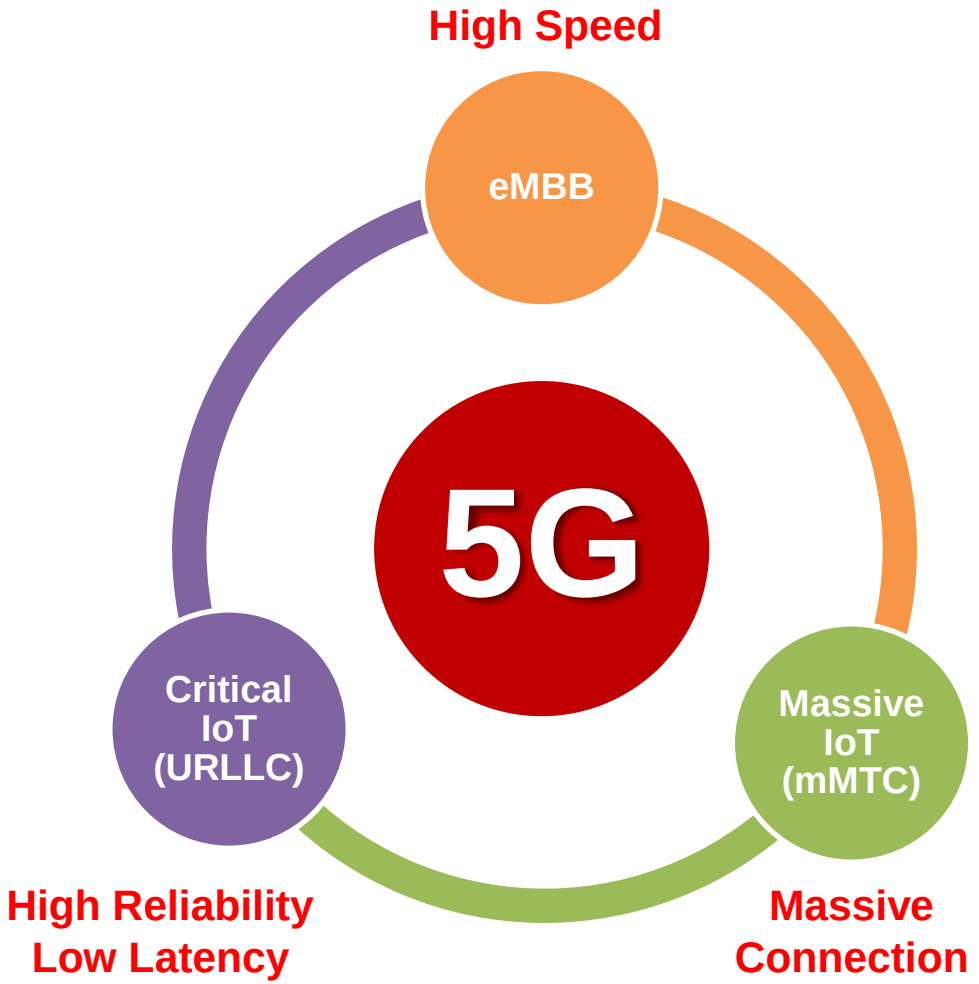
A brief history of mobile network generations



5G Services


High Speed
eMBB
5G
Critical IoT (URLLC)
Massive IoT (mMTC)
High Reliability Low Latency
Massive Connection

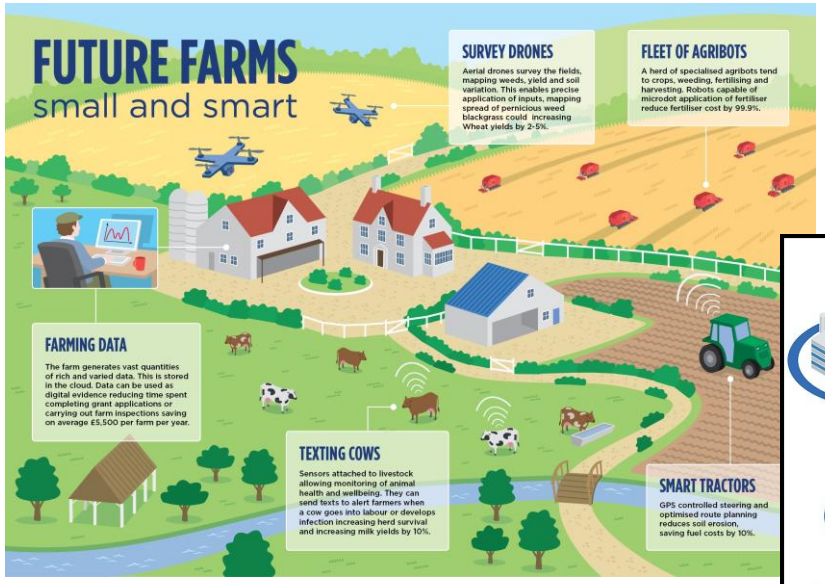
5G Use cases: eMBB

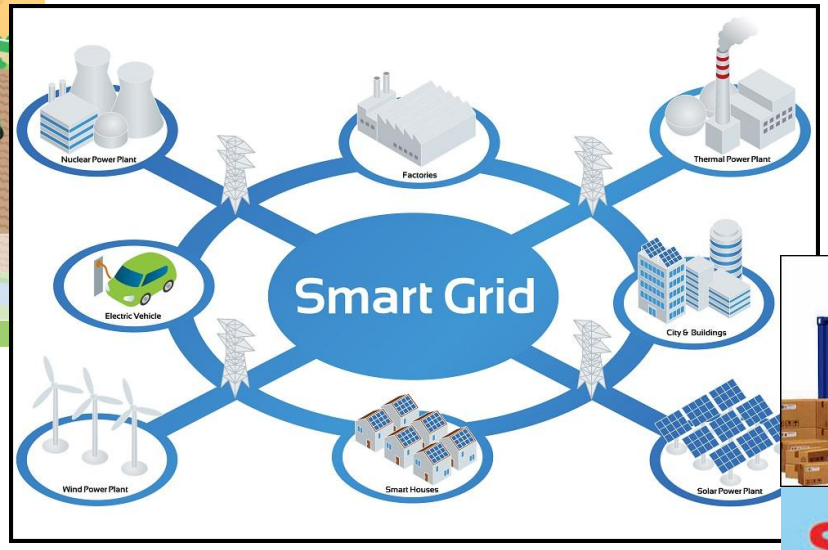
Virtual Reality

Augmented Reality

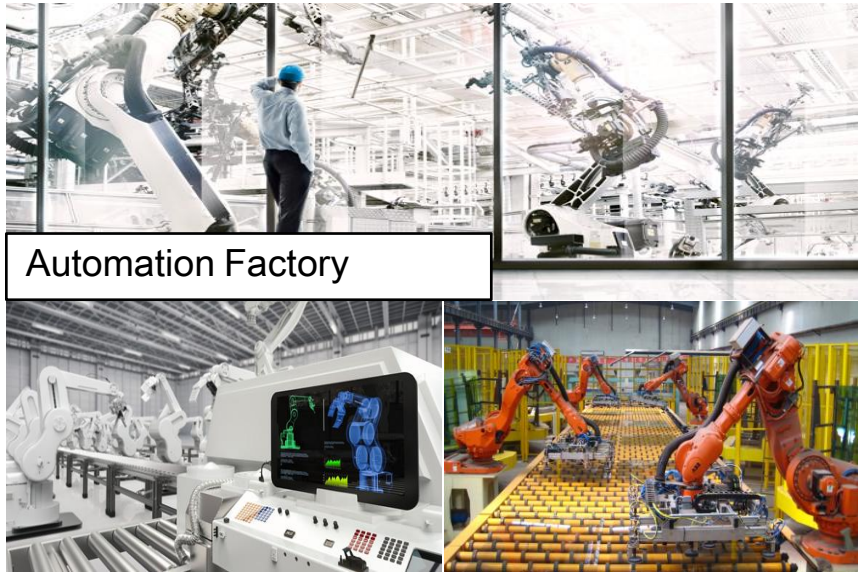
8K Ultra HD Video

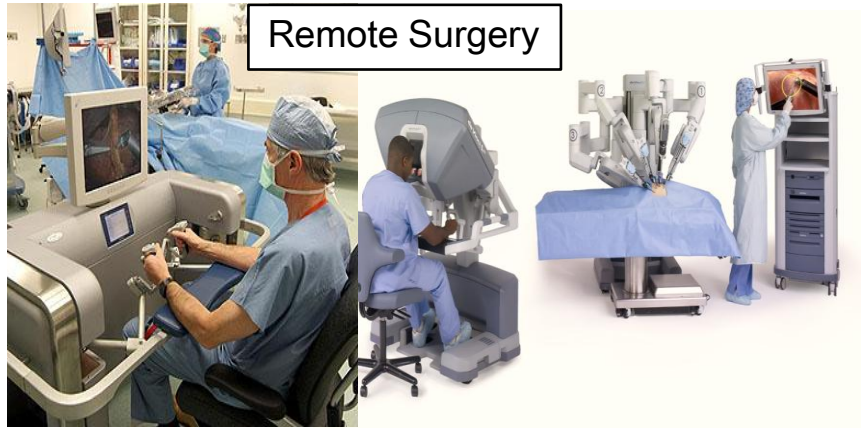
5G Use cases: Massive IoT





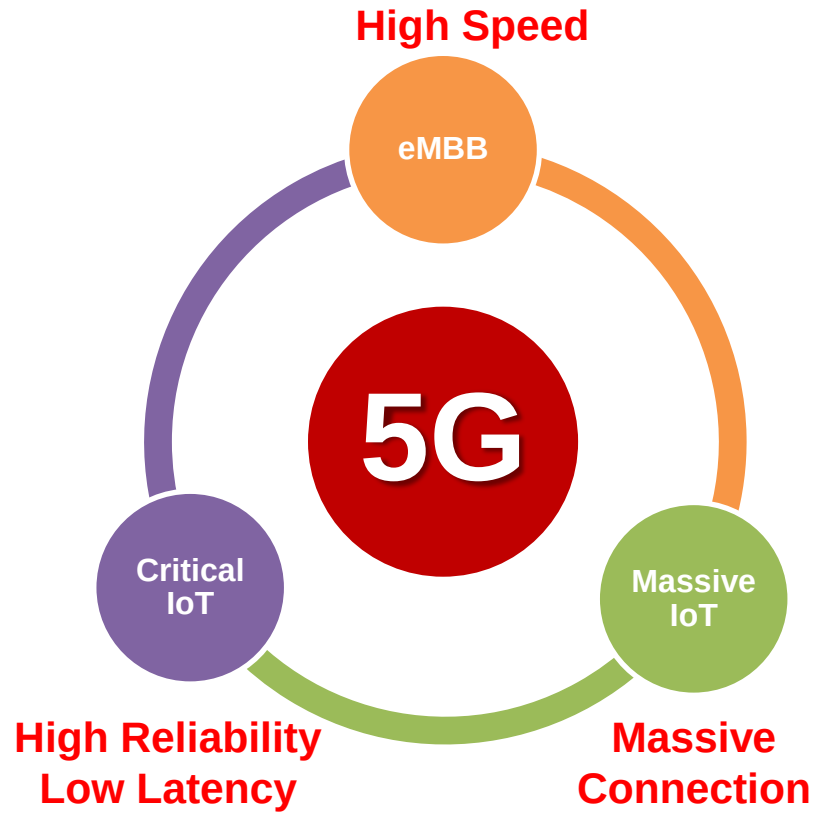
5G Use cases: Critical IoT





5G Services


5G Vision
What 5G is about
eHealth
Traffic priority
Connected house
Domotics
Smart Mobility
Smart Wearables
Utility management
Water quality
Smart car
Car - to - car communication
Security & Survillance
Entertainment
Apps beyond imagination
Smart parking
Smart Grids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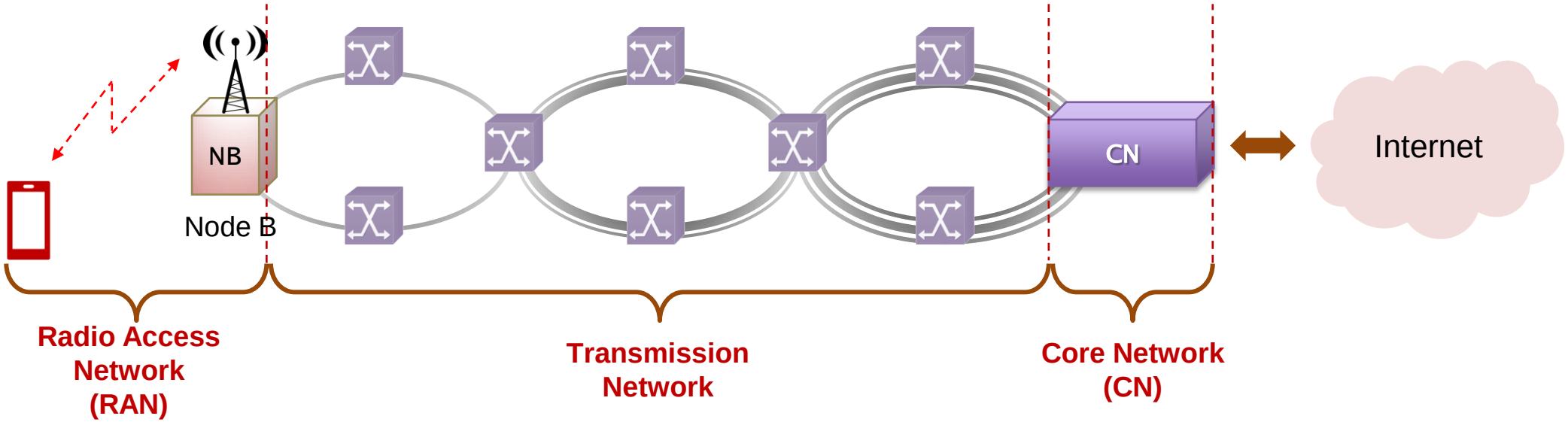
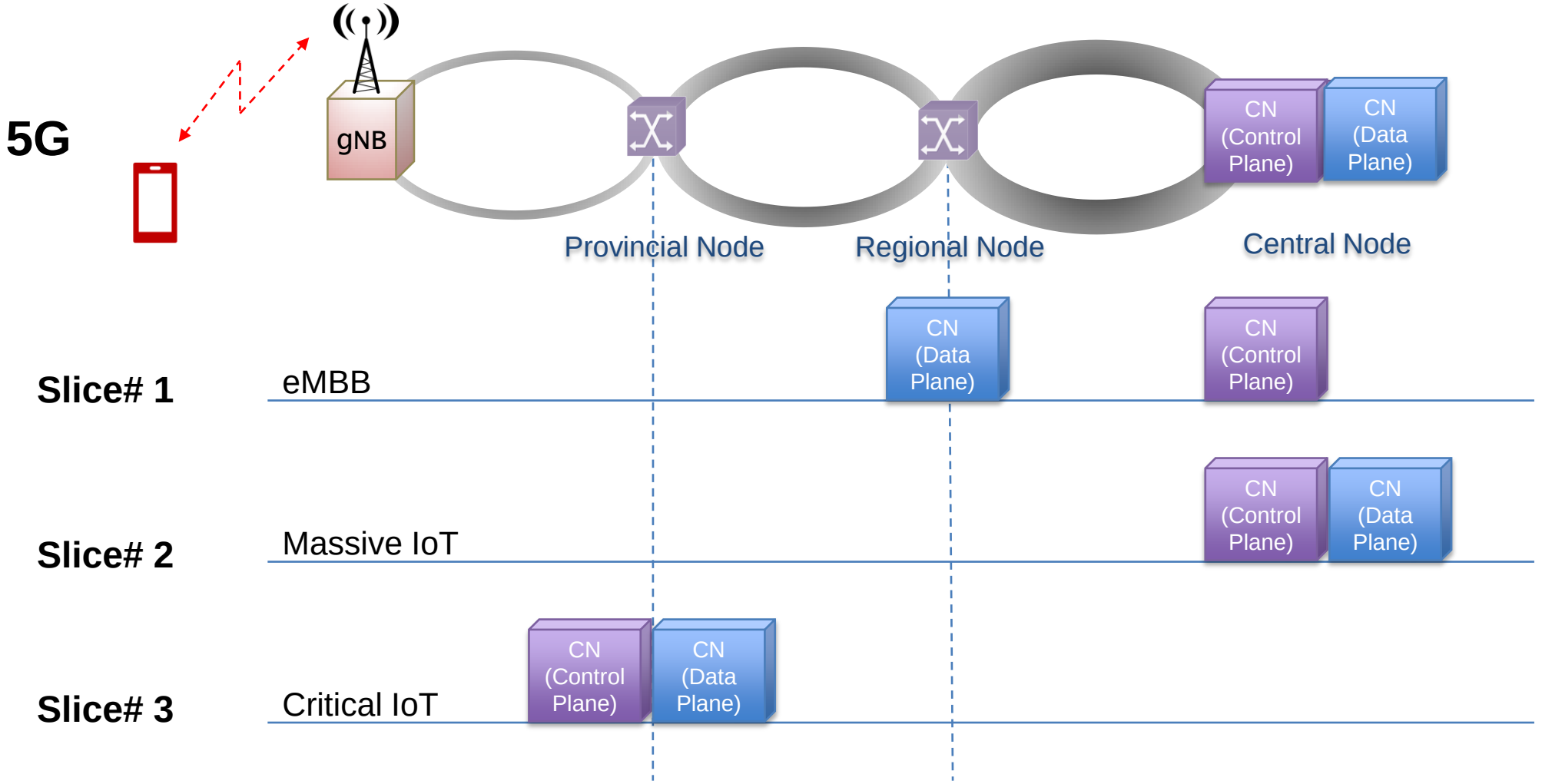
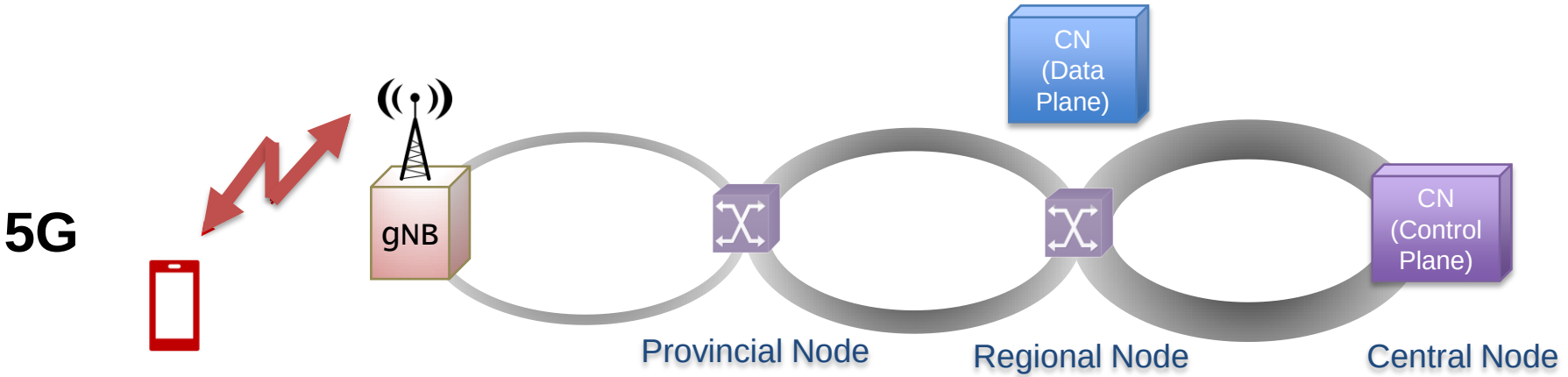
Mobile Network Infrastructure: Overview

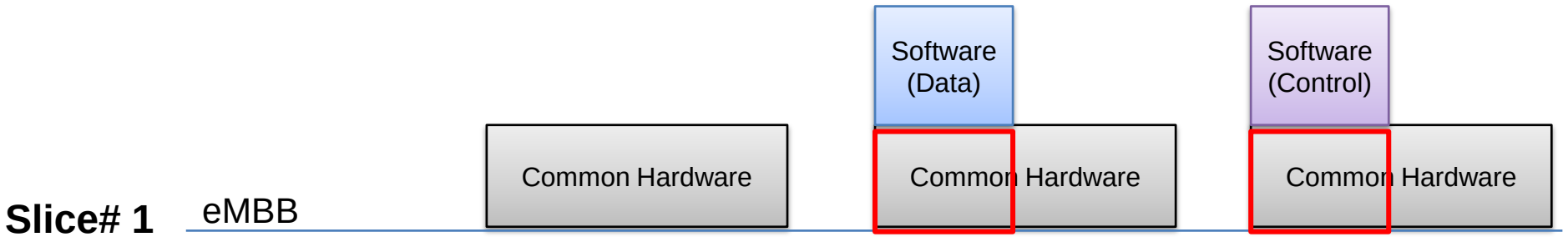


CN transformation: Network Slicing

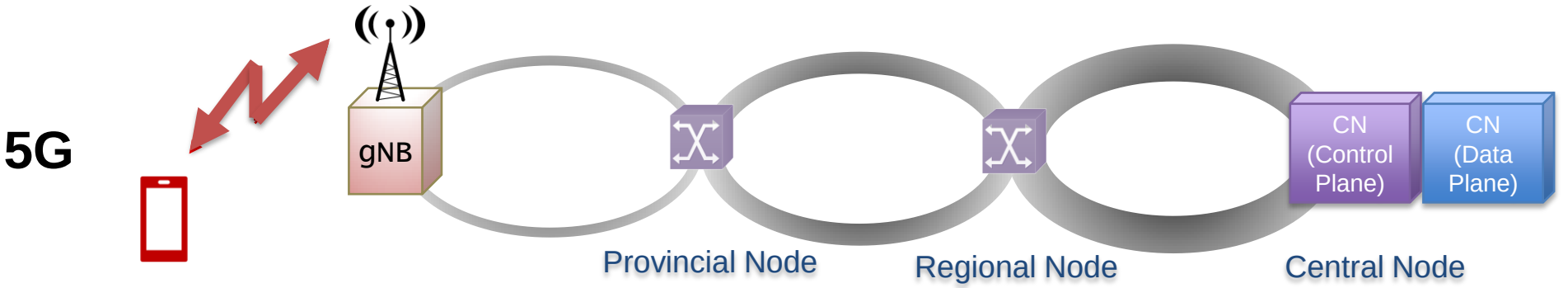


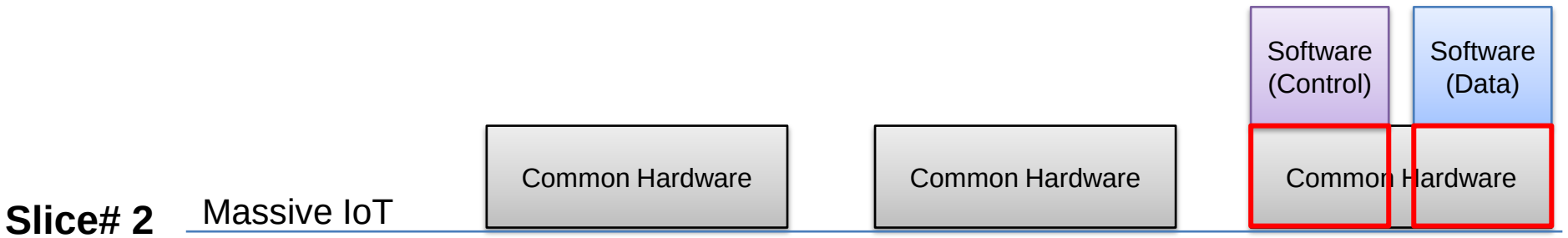
CN transformation: Network Virtualization



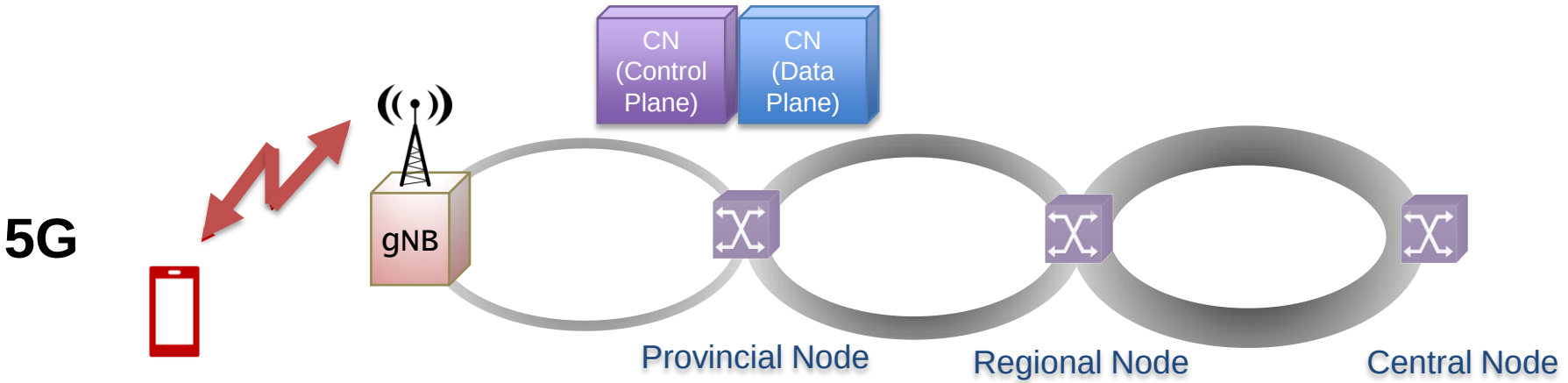


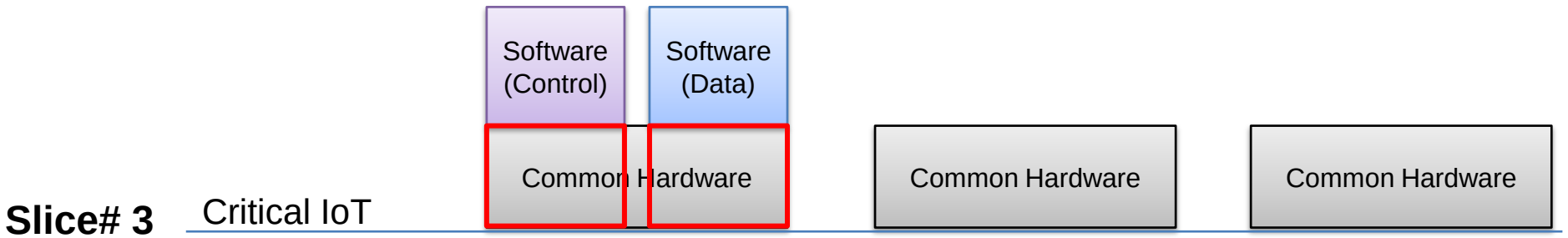
CN transformation: Network Virtualization



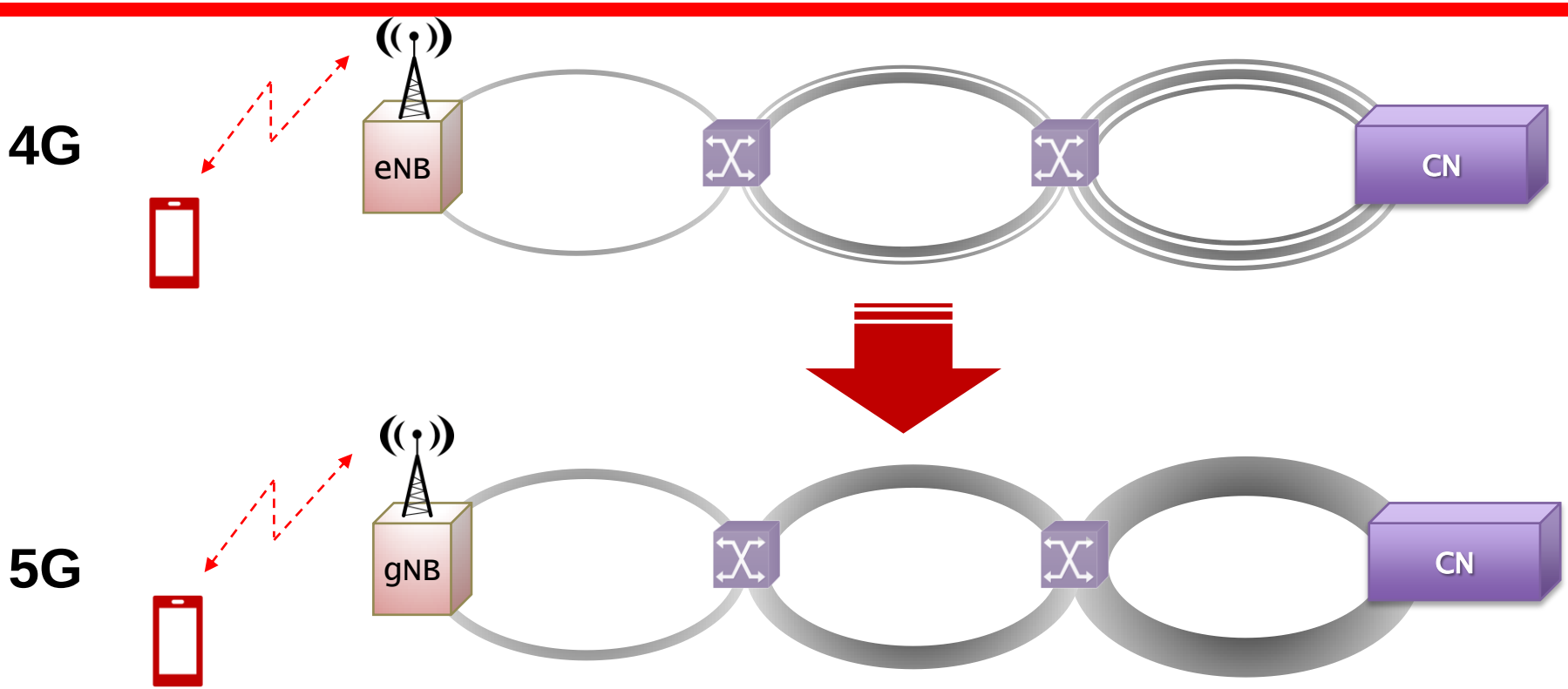


CN transformation: Network Virtualization





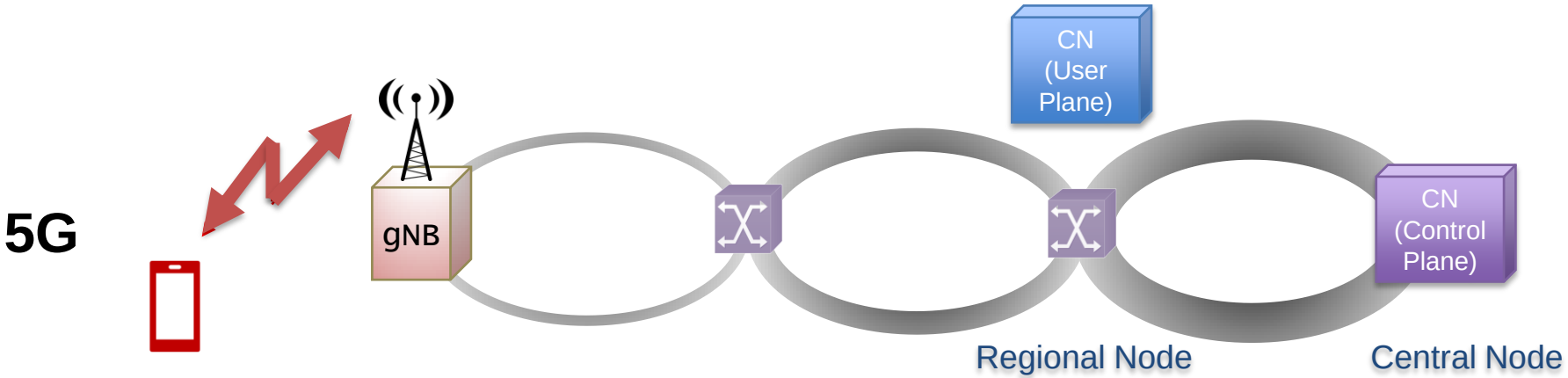
Transmission Network Transformation



Key Transformation:

- More transmission capacity.
- Low latency.
- Precise time synchronization.
- IPv6

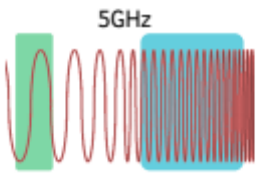
Radio Network transformation



Key Transformation:

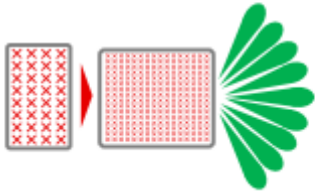
- More flexible =>Virtualized RAN.
- More radio capacity, lower latency.

New spectrum



- 700MHz, 1.5, 2.3 and 3.5GHz
- mmW bands, >6GHz (2020+) enabling massive MIMO
- But also refarming

True Massive MIMO

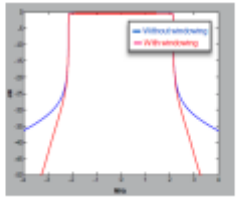


- Beamforming
- Multiuser beamforming

Larger bandwidth

- Larger contiguous BW

Confined OFDM & Very low latency



- Spectrum more confined
- Vision of 1ms latency

5G Spectrum: Key challenges for 5G deployment in Thailand

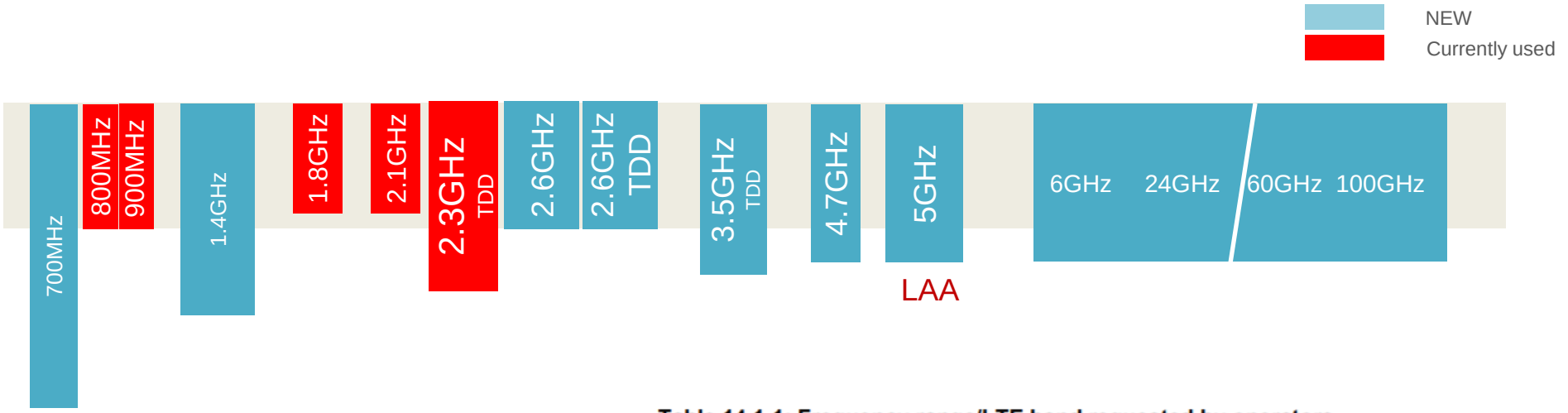


Table 14.1-1: Frequency range/LTE band requested by operators

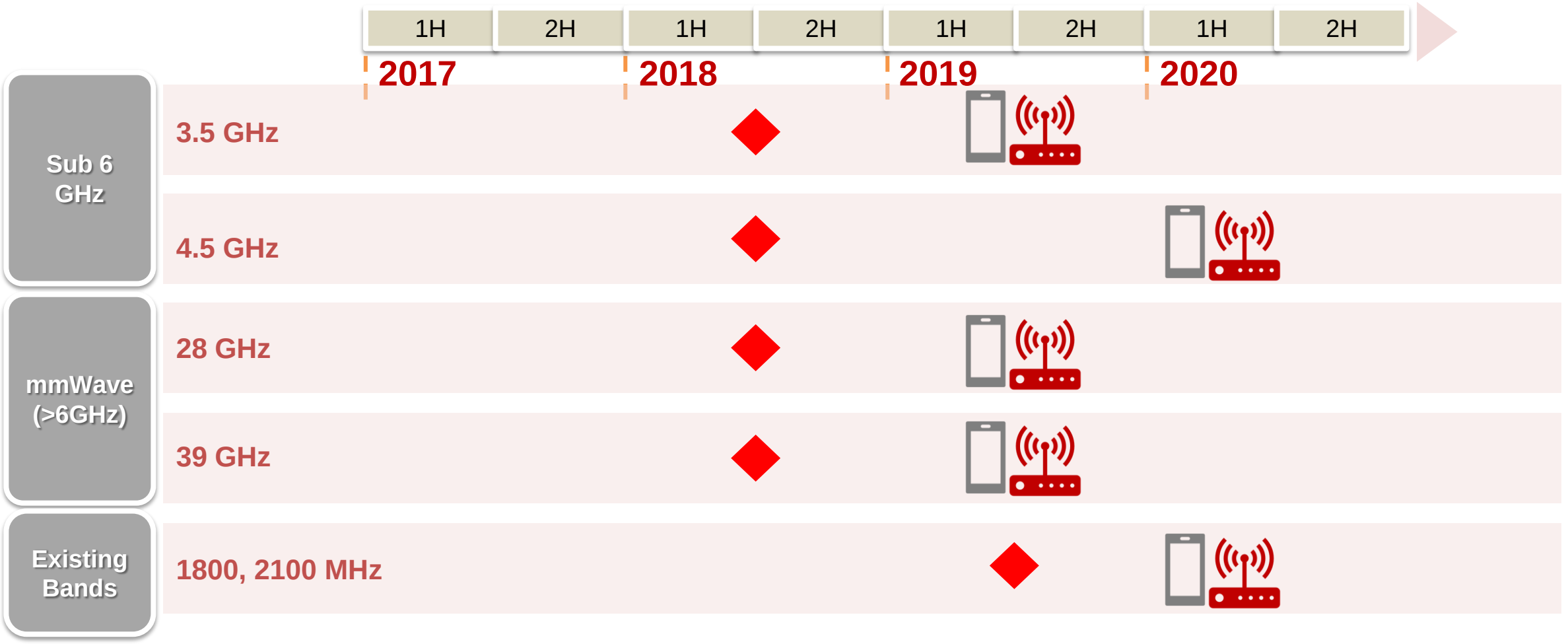
Frequency range/LTE band	Operators whose request is included in the frequency range
3.3-4.2 GHz	NTT DOCOMO, INC., KDDI, SBM, CMCC, China Unicom, China Telecom, KT, SK Telecom, LG Uplus, Etisalat, Orange, Telecom Italia, British Telecom, Deutsche Telekom
4.4-4.99 GHz	NTT DOCOMO, INC., KDDI, SBM, CMCC, China Unicom, China Telecom,
24.25-29.5 GHz	NTT DOCOMO, INC., KDDI, SBM, CMCC, KT, SK Telecom, LG Uplus, Etisalat, Orange, Verizon, T-mobile, Telecom Italia, British Telecom, Deutsche Telekom
31.8-33.4GHz	Orange, Telecom Italia, British Telecom
37-40 GHz	AT&T, Verizon, T-mobile
1.427-1.518G	Etisalat
Band 1	China Unicom, China Telecom
Band 3	CMCC, China Telecom
Band 7	CHTTL, British Telecom
Band 8	CMCC
Band 20	Orange
Band 28	Orange
Band 41	Sprint, China Telecom, C-Spire, China Unicom
band 66	T-mobile

Main stream for 5G New Radio

New 5G spectrum bands in Thailand remain to be addressed.

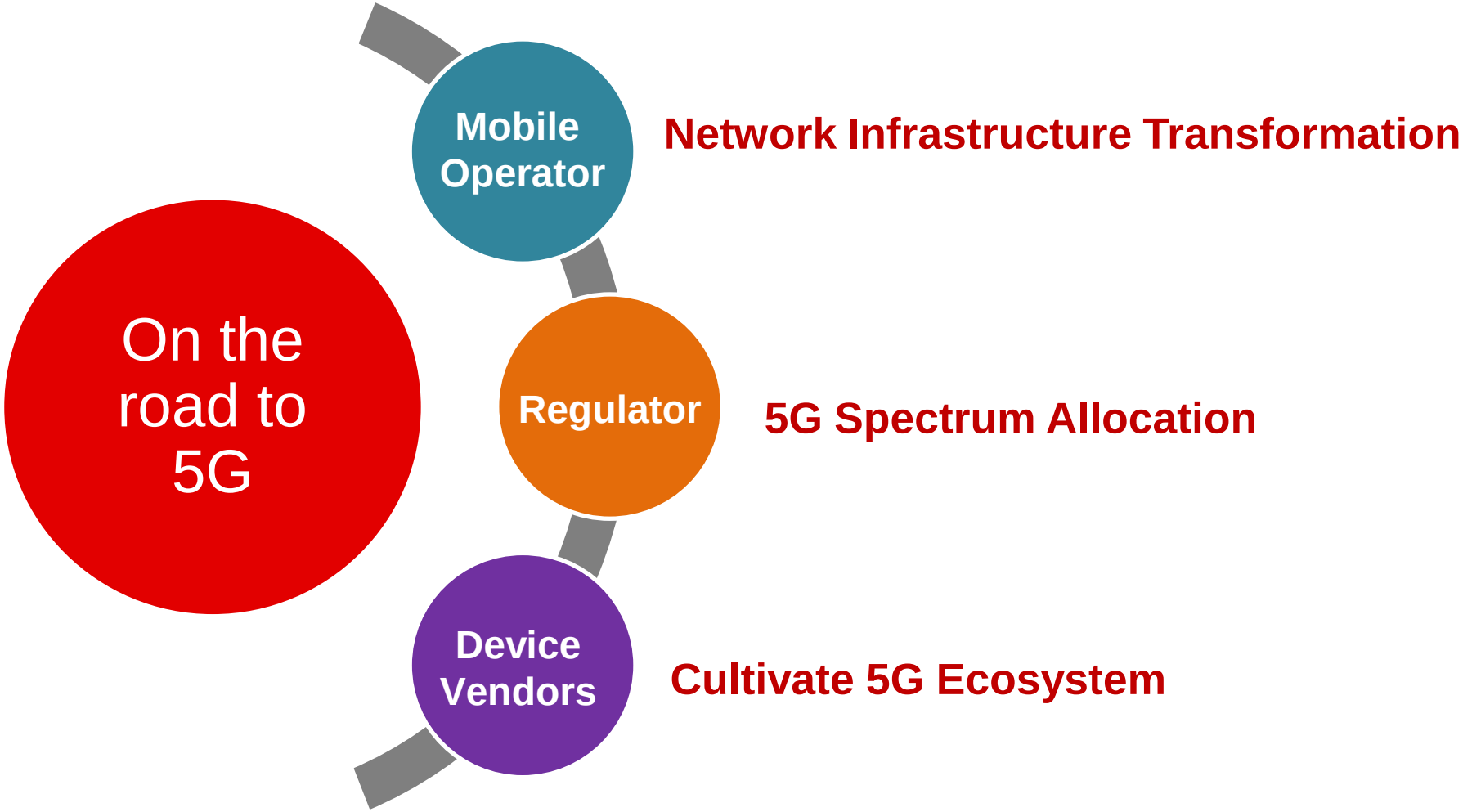
Source: ETSI,TR 138.912 V.14.00

5G Ecosystem: 5G Device Roadmap (Speculated)



Source: Ericsson

Outlook to 5G: Summary



THANK YOU