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View on 5G Radio Technologies and Standardization

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3GPP RAN workshop on 5G
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Consideration on 5G Requirements

- 3GPP 5G air interface should meet the requirements **not limited to the three usage cases** defined for IMT-2020
  - Enhanced Mobile Broadband
  - Ultra-reliable and low latency communications (URC)
  - Massive machine type communications (Massive MTC)
  - **Additional use cases, which are currently not foreseen**

- 5G should consider **different key capabilities** depending on **the specific scenarios of each use case**
  - **eMBB**: indoor hotspot, dense urban, urban coverage, rural coverage, high speed, etc.
  - **URC**: self-driving, automatic control, virtual reality, etc.
  - **Massive MTC**: metering, wearable devices, etc.

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Overview of 5G Air Interface

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Design Principle

5G air interface should be **unified** for operation and implementation, **flexible** for diverse service requirements and **scalable** for unseen use cases currently

- **Unified design to fit for all requirements**
  - Design a unified framework for all use cases and scenarios
  - Unified air interface should be applied regardless of diverse use cases
- **Flexible configurations for diverse service requirements**
  - Fit for end-to-end network slicing to support diverse requirements
  - Flexible air interface configurations for specific scenarios
- **Scalable for additional use cases, which are currently not foreseen**

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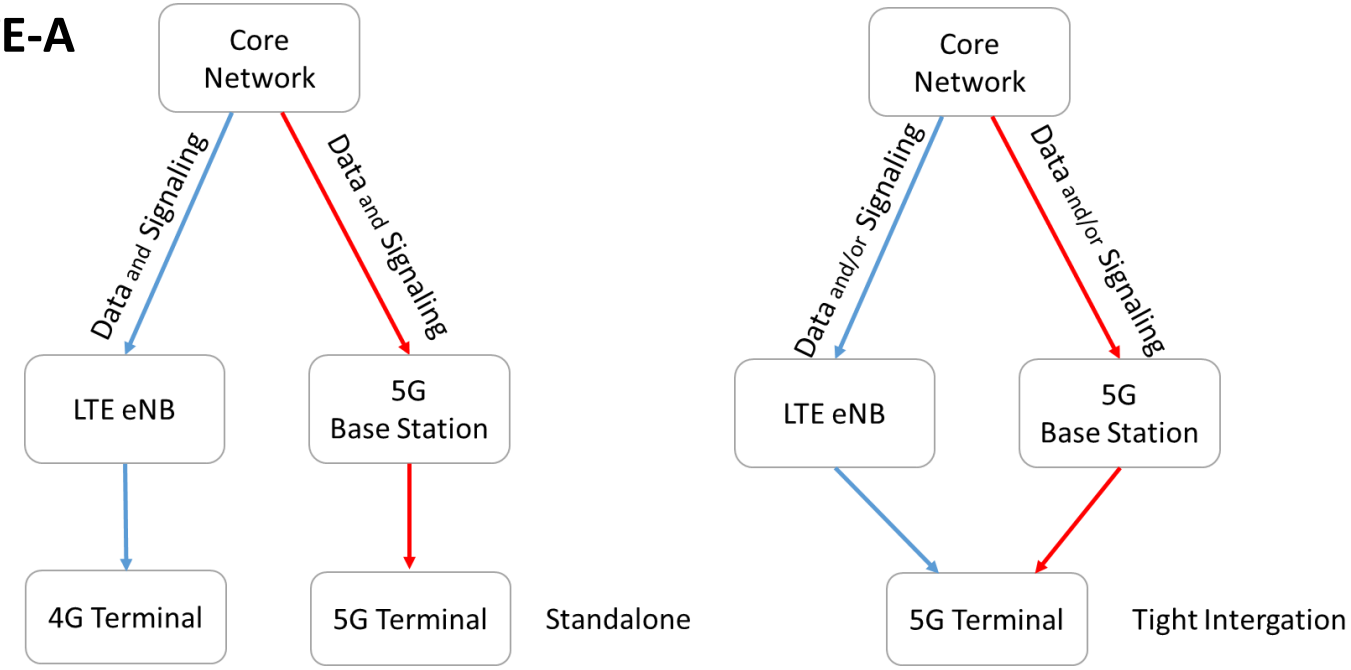
Design of 5G Air Interface

- **5G should cover both sub-6GHz and beyond-6GHz spectrum**
  - Sub-6GHz for continuous coverage, with the same ISD as LTE/UMTS
    - Both TDD and FDD, suitable for deploying on refarming spectrum
    - For eMBB, Massive MTC and URC; flexible bandwidth from 200kHz to up to 100MHz
  - Beyond-6GHz for capacity
    - Only for eMBB; bandwidth up to 300MHz
- **5G should have the abilities for standalone operation and tight integration with LTE-A**



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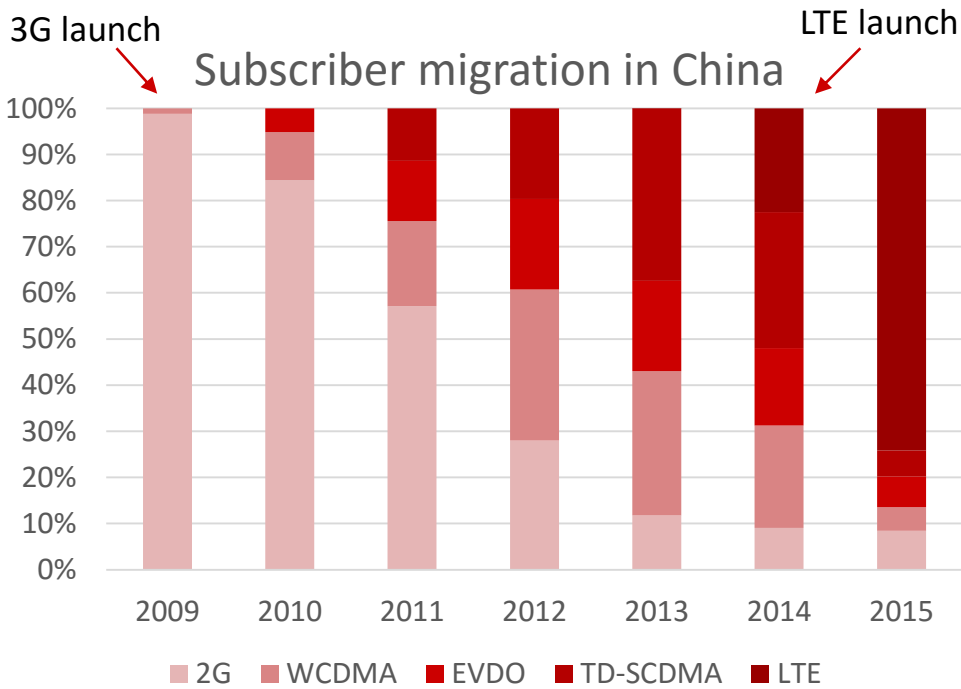
View on 5G Operations



- **Subscriber migration takes long time**
  - For the initial years, new RAT have low subscriber migration

- **5G operation could be divided into two steps**
  - **Step1 Initial deployment**
    - Coverage is the most important aspect
    - Sub-6GHz spectrum is more suitable for ensuring initial coverage
  - **Step2 Capacity boosting**
    - Exploring abundant beyond-6GHz spectrum for capacity
    - Refarming sub-6GHz spectrum

Proposal: 5G techniques for sub-6GHz should have high priority for initial deployment

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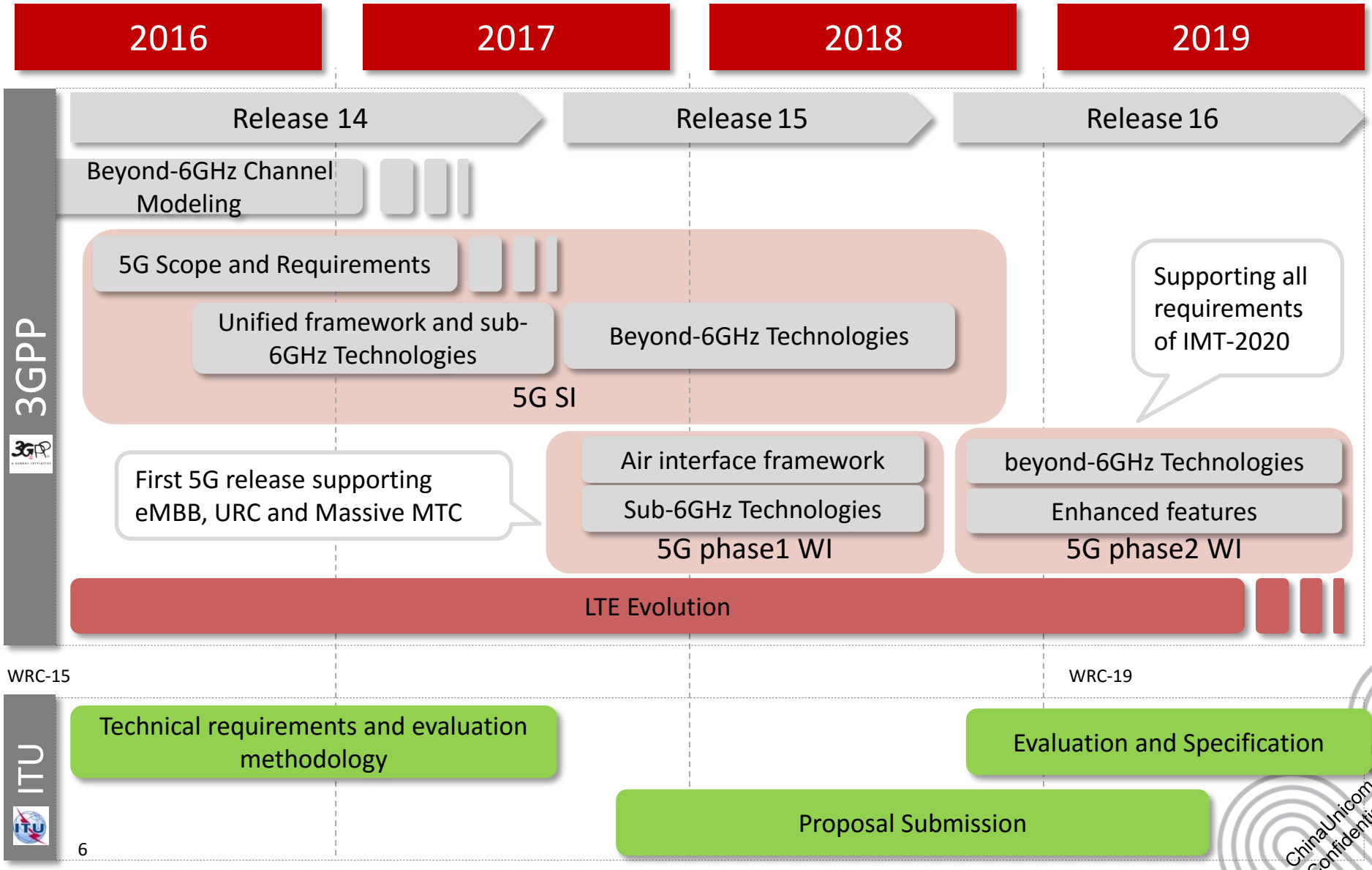
Timeline for 5G Standardizations



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Summary

- Unified, flexible and scalable air interface for 5G
- Standalone and tight-integration with LTE-A
- 5G covers both sub-6GHz and beyond-6GHz spectrum
- Sub-6GHz in priority
- 5G in R15 should supports at least the three use cases

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Thank you!

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