

Initial reflections on 6G standardization

6G Release 20 SI Status

Physical layer

- Waveform for communications agreed
 - CP-OFDM in DL and CP-OFDM/DFT-S-OFDMS in UL
- Numerology (Sub-carrier spacing)
 - 15 kHz FDD, 30 kHz TDD for up to 8 GHz and 120 kHz for FR2
- Decisions on waveform and numerology key for efficient multi-radio spectrum sharing (MRSS) between 5G and 6G
- Modulation
 - Uniform QAM as in 5G agreed as baseline
 - Geometric and Probabilistic shaping under study
 - Higher order QAM (>1024QAM) under study
- Channel coding
 - 5G LDPC for data and polar codes for control for data rates in NR Range
 - New base graph under study for LDPC for data rates beyond NR
- Coverage
 - Match coverage at ~3.5 GHz when designing coverage for ~7 GHz

Protocols

- Studies ongoing on
 - Improvements to control plane
 - Improvements to user plane
 - UE capability framework for 6G
 - Lower layer security
- Development of a common data collection framework
 - Can be used for various purposes AI/ML, sensing, positioning etc.

NTN

- Support for GEO, MEO, LEO constellations
- Support for GNSS-less operation
- Harmonized design with terrestrial
- Support interworking and mobility within NTN and between TN and NTN

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Architecture

- Naming
 - The nodeB in 6G is called the anB and the interfaces between them is the Xa interface
- RAN-CN functional split / interface
 - For 5G legacy features which to be based on the 5G RAN-CN functional split
 - Discussions on peer-to-peer vs. service-based interface
- Support for self-configuration and self-optimization, including ANR and collection of MDT data.
- Support for both Non-centralized and Co-sited deployments
- Fronthaul
 - 6G NodeB architecture includes a distinct logical Radio Unit (RU) with the functions and interface not specified in 3GPP (in ORAN).

Spectrum, RF, testing

- 6G bands will have the prefix "s"
- Channel bandwidth
 - Minimum is 3 MHz
 - Maximum is 400 MHz for base stations with UEs supporting 400MHz in DL (optional) and 200 MHz in UL

Migration

- Stand-alone operation with multi-radio spectrum sharing (MRSS) between 5G and 6G is the main migration solution
- Additional aggregation scenarios studied are aggregation of 5G and 6G cells with either 5G or 6G RAN node as anchor or aggregation in CN

O-RAN 6G status

— O-RAN 6G work starting now!

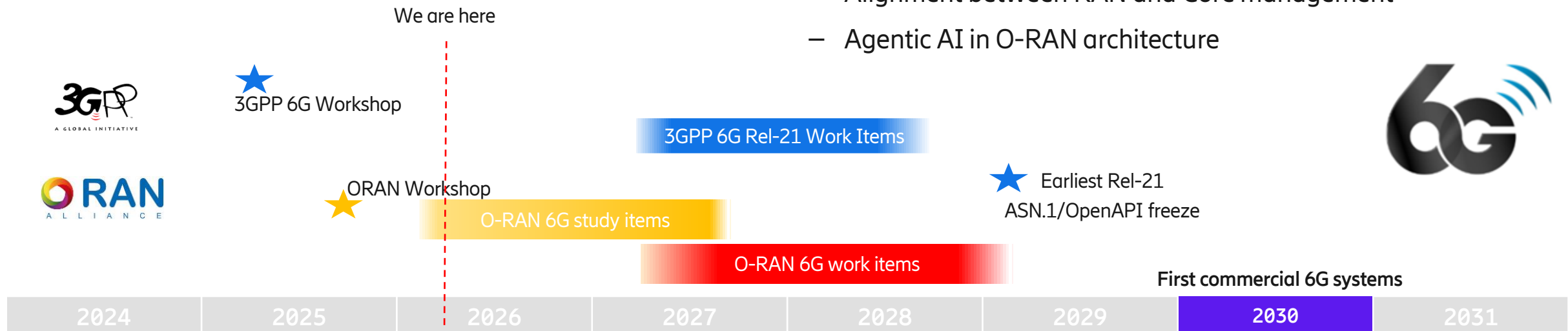
- First 6G workshop in the end of October. 29 presentations from different companies.
- Use case and requirement study started, more studies during 2026

• High level principles

- Critical that we achieve **one 6G system** across 3GPP and O-RAN
- Critical that 3GPP and O-RAN **time plans are aligned**, no delay for O-RAN deployments
- G-agnostic SMO evolution

• Some key discussion topics

- Evolution of non-RT and near-RT RICs
- Alignment between RAN and Core management
- Agentic AI in O-RAN architecture





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