# *5G Standardization update*
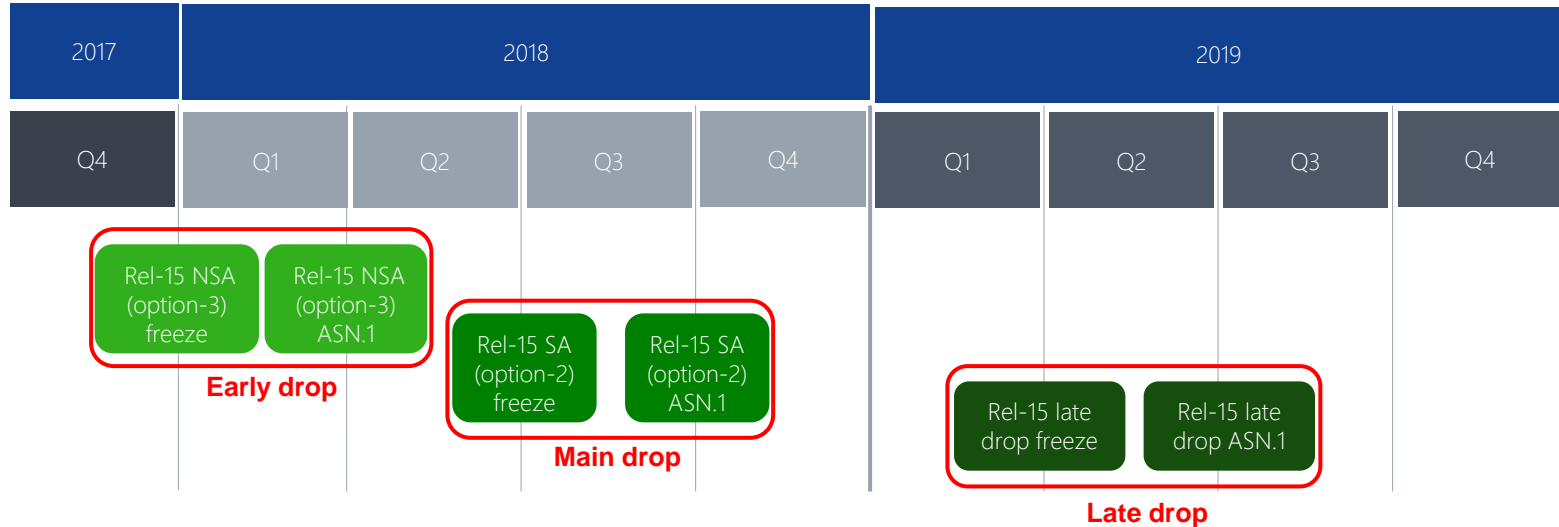
Balazs Bertenyi – Chairman of 3GPP RAN

# *Outline*

📶 Release 15 stability and completion

📶 Release 16 progress

📶 Release 17 planning

# Release 15 completion

# *Release 15 stability and completion*

| 2017 | 2018 | | | | 2019 | | | |
|---|---|---|---|---|---|---|---|---|
| Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |

Rel-15 NSA (option-3) freeze | Rel-15 NSA (option-3) ASN.1

**Early drop**

Rel-15 SA (option-2) freeze | Rel-15 SA (option-2) ASN.1

**Main drop**

Rel-15 late drop freeze | Rel-15 late drop ASN.1

**Late drop**

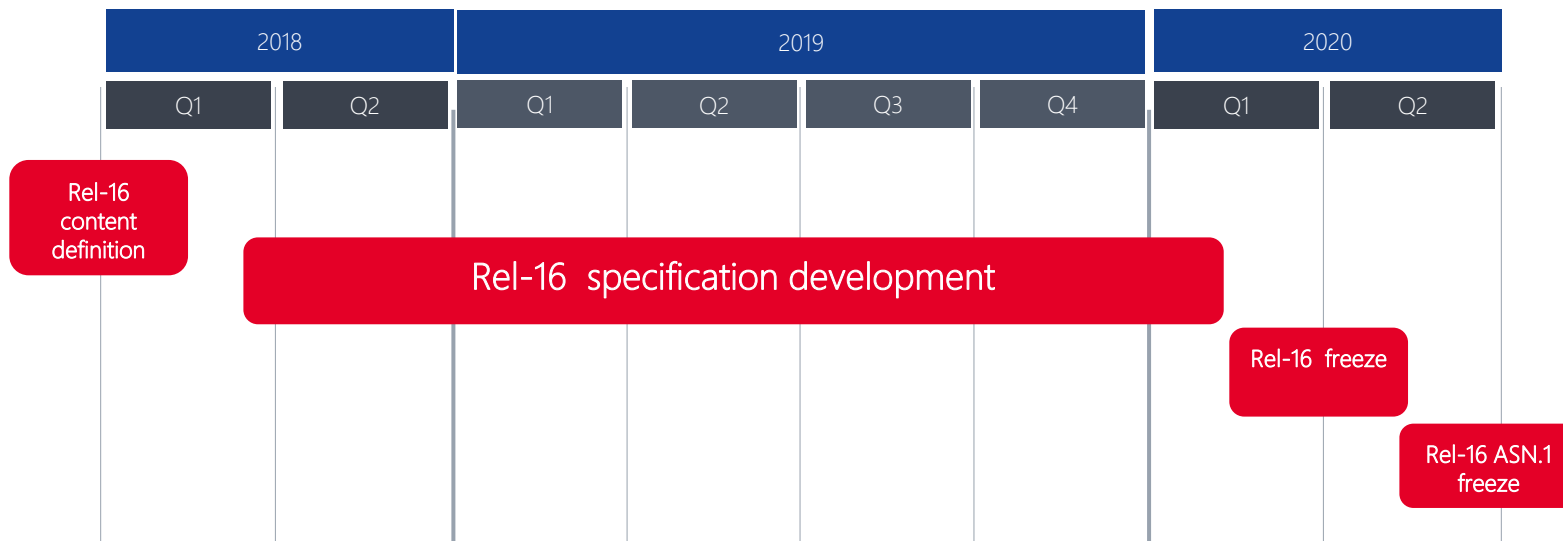- Rel-15 NSA is driving commercial launches across the globe (based on March/2019 version of specs

- Rel-15 SA coming soon, first in China, driven by vertical IoT business

- Rel-15 late drop finalized specs for migration architectures

# *Release 16 progress*

# *Release 16 timeline*

| 2018 | | 2019 | | | | 2020 | |
|------|------|------|------|------|------|------|------|
| Q1 | Q2 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |

**Rel-16 content definition**

**Rel-16 specification development**

**Rel-16 freeze**

**Rel-16 ASN.1 freeze**

Rel-16 focus equally on functions for Verticals and overall System Improvements

# *Release 16 progressing towards completion*

- 5G V2X
  - Targeting advanced use cases beyond LTE V2X
- Industrial IoT and URLLC enhancements
  - Adding 5G NR capabilities for full wired Ethernet replacement in factories: Time Sensitive networking, etc… with high reliability
- 5G NR operation in unlicensed bands
  - Includes both Licensed Assisted Access (LAA), as well as Standalone Unlicensed operation
- System improvements and enhancements
  - Positioning
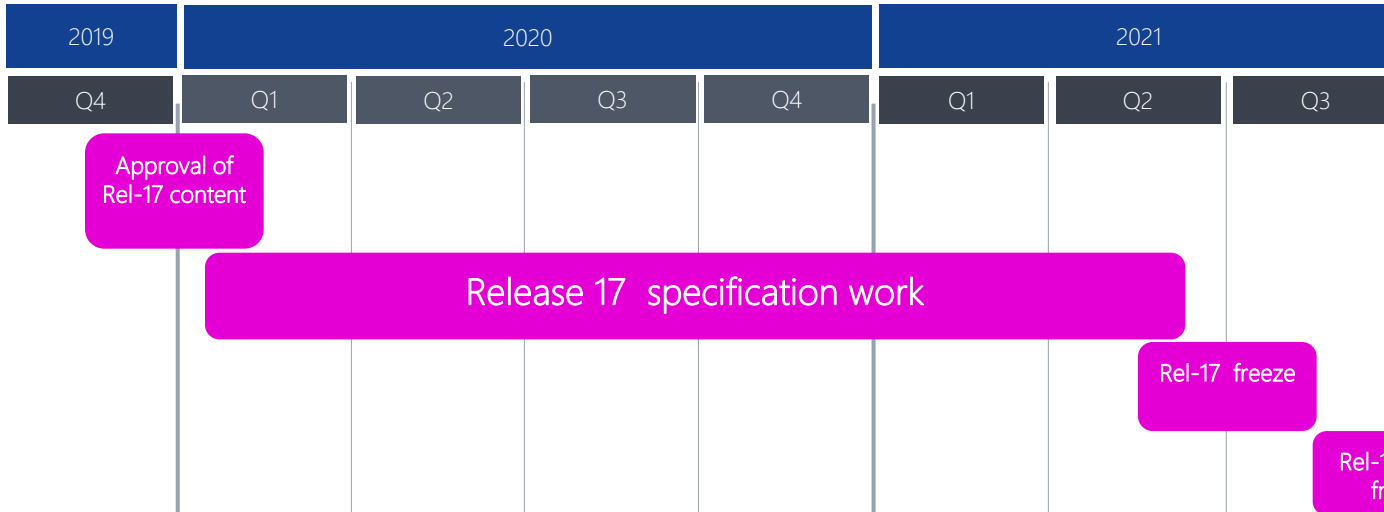  - MIMO enhancements
  - Power Consumption improvements

# *Release 17 planning*

# *Release 17 - Key milestones*

- RAN#84 (June/2019): One full day was set aside for initial presentations on Rel-17 proposals
  - Consolidation of multi-company proposals into Work Areas, start email discussion on these
- RAN#85 (September/2019): Review of email discussion progress on Work Areas, adjust where necessary
- RAN#86 (December/2019): Approval of Release 17 content

| 2019 | 2020 | | | | 2021 | | |
|------|------|------|------|------|------|------|------|
| Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |

Approval of Rel-17 content

Release 17 specification work

Rel-17 freeze

Rel-17 ASN.1 freeze

# *Release 17 Work Areas 1/3*

- **NR Light**
  - Optimal operation for mid-tier NR devices (e.g MTC, wearables, etc…), incl power saving aspects
- **Small data transfer optimization**
  - Small Data and Inactive Data transmission (both Uplink and Downlink)
- **Sidelink enhancements**
  - Includes V2X, Commercial, Critical Communications
  - Includes FR2 (>6GHz) aspects
  - Achieve maximum commonality between commercial, V2X, and Critical Communication usage of sidelink
- **NR above 52.6 GHz (inlc 60GHz unlicensed)**
  - Preparing for waveform decision for >52.6GHz, and decision cut off point (between waveforms)
- **Multi SIM operation**
  - Identify the RAN impact of target use cases for Multi SIM operation, identify specification impacts
- **NR multicast broadcast**
  - Main drivers: V2X and Public Safety

# *Release 17 Work Areas 2/3*

- **Coverage enhancements**
  - Clarify requirements for all relevant scenarios focusing on extreme coverage
  - Data rate target FFS.
  - Includes both indoor as well as wide area

- **NB-IoT and eMTC enhancements**
  - Enhancements motivated by current commercial deployments

- **IIoT and URLLC enhancements**
  - Header compression aspects and other Release 16 leftovers

- **MIMO enhancements**
  - Enhancements motivated by current commercial deployments
  - E.g.: Support for cases with high speed mobility, better support for FDD

- **NR for Non Terrestrial Networks**

- **Integrated Access and Backhaul Enhancements**
  - E.g. Mobile IAB

# *Release 17 Work Areas 3/3*

⮞ Generic enhancements to NR-U
- • Generic unlicensed operation enhancements not covered by any other item

⮞ Power saving enhancements
- • Enhancements for power saving of smartphones
- • Network power saving aspects

⮞ RAN data collection enhancements
- • Includes SON and MDT enhancements
- • Data collection to enable AI

⮞ Positioning enhancements
- • Factory/campus positioning, IoT, V2X positioning, 3D positioning, cm level accuracy, incl latency and reliability improvements

# *Release 17 content definition*

- Email discussion for each Work Area to be conducted on the RAN_Drafts exploder until December/2019
  - This is an open email exploder, anyone can follow the discussions
  - Each email discussion to use a dedicated tag in the Subject: (and potential sub-tags) for easy traceability

- Release 17 content definition decision in December (3GPP TSG#86):

  Only a small subset of all Work Areas will be taken on board!

  *Note: What is left out can again be considered in Release 18*

# Thank You !

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