

3GPP TSG RAN Rel-19 workshop
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Agenda: 5

Views on NR MBS evolution in Rel-19



MBS evolution in 3GPP

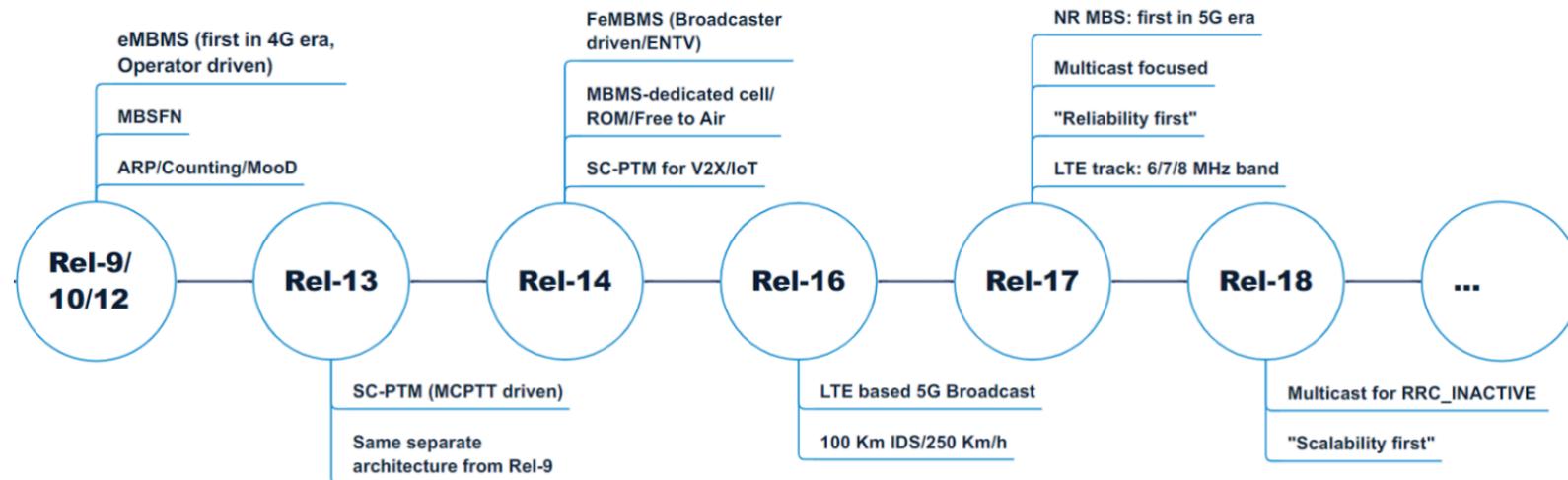


Fig 1. evolution of MBS in 3GPP

- **Observation:**

- Rel-17 and Rel-18 NR MBS lay the foundation and focus on reliability and scalability, respectively.
- Missing parts: larger coverage, vertical and new scenarios (e.g., RedCap, NTN), and higher throughput support.

Potential features - Coverage enhancement

• Motivation and candidate techniques:

- eCP can be used to support MBS to cover larger number of UEs in larger area (R1-2305964).
- Single Frequency Network (i.e., MBSFN in LTE) can significantly boost performance especially on cell edge reception quality. In Rel-17, MBSFN can be supported by implementation with no spec impacts.

• Potential issues:

- Coexistence of NCP unicast and eCP MBS, e.g.,
 - separate active BWPs for MBS and unicast,
 - enhanced CFR definition, i.e., different CP types for CFR and associated DL BWP,
 - enhanced UE capability on FDM reception of unicast and MBS with different CP types, or
 - in a TDM way?
- Architecture impacts from MBSFN, e.g.,
 - systematic impacts to SA2/RAN3 from SYNC protocol.
 - RAN2/RAN1 on new physical channel (i.e., PMCH).

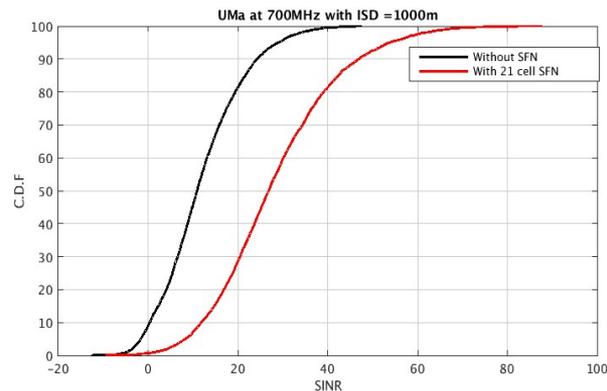


Fig 2. there are benefits, and impacts too for MBSFN.

Potential features - New cases & scenarios

- **Motivation and candidate techniques:**

- IoT is one of the major use cases for MBS: In Rel-18, RedCap for broadcast is being enhanced as TEI18; and whether to support multicast reception in RRC_INACTIVE for RedCap UE is not clear.
- Support of NTN or IoT-NTN: NTN or NTN with IoT aims to provide service in large coverage / to large number of UEs that fits into the use case of MBS.

- **Potential issues:**

- RedCap UE support, e.g.,
 - backward compatibility & resource efficiency (e.g., same MTCH PDSCH resources intended for various types of UEs, as in LTE that certain service targets both eMTC M1 & M2 UEs).
 - future proofing, to better support new UE types, e.g., eRedCap UEs.
 - gNB awareness of intended UE types.
- NTN or IoT-NTN support, e.g.,
 - MAC enhancement based on existing enhancement on unicast.
 - service continuity of broadcast and multicast.
 - location dependent services support in case of NTN cells.

Potential features - Lift the limitations

- **Motivation and candidate techniques:**

- Rel-17/18 NR MBS was designed in a way to limit UE complexity, e.g., no CA for multicast (only one carrier can be configured for multicast), no cross-carrier scheduling and FDMed transmission were limited.
- However, this limits network implementation flexibility, sometimes worsens the performance, therefore MBS might not be able to support new use cases, e.g., XR.

- **Potential features to be supported:**

- CA for multicast reception, e.g., support of MBS configuration on more than one carriers.
- cross-carrier scheduling for multicast.
- FDMed PDSCH reception between SPS PDSCHs as well as between SPS PDSCH and DG PDSCH (between MBS services, between unicast and MBS).

Suggestions on Rel-19 NR MBS evolution

- **High priority:**
 - eCP, e.g., study the intended ISD, on which SCS (15 or 30 KHz), simultaneous reception of unicast and broadcast with different numerology). [RAN1]
- **Medium priority:**
 - RedCap, however pending on RAN2 progress on TEI18 and Rel-18 NR MBS enh. [RAN2]
 - Throughput enhancement, e.g., CA, cross-carrier scheduling for multicast, FD-Med reception on specific cases especially SPS transmission. [RAN1]
- **Low priority:**
 - MBSFN (due to its systematic impacts, e.g., new physical channel PMCH and introduction of SYNC protocol). [RAN1, RAN2, RAN3]

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