**3GPP TSG RAN meeting #90e RP-20xxxx**

**Electronic Meeting, Dec. 7 - 11, 2020**

## Status Report to TSG

**Agenda item:** 9.8.8

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** | NR Multicast and Broadcast Services | | | | |
| included in this status report | Study Item:  No | Core part:  Yes | Performance part:  No | | Testing part:  No |
| **Acronym** | NR\_MBS | | | | |
| **Unique ID** | 860048 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-201038 | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item:  N/A | Core part:  09/2021 | Performance part:  N/A | Testing part: N/A | |
| **Overall Completion level** | Study Item:  N/A | Core part:  RAN1: 15%  RAN2: 20%  RAN3: 25% | Performance Part:  N/A | Testing part: N/A | |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |  |
| --- | --- | --- |
| **Leading WG** | | TSG RAN WG2 |
| **Rapporteur** | **Name** | Zhenzhen CAO |
| **Company** | Huawei |
| **Email** | caozhenzhen@huawei.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.  
 One time unit (TU) corresponds to ~ 2 hours in the meeting.  
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.  
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

Due to COVID-19 pandemic, this WI has been rescheduled and started only from Q3/2020 which is 6 months delay compared to the original schedule agreed in RP- RP-193248. For the new schedule, TUs need to be allocated for WG meetings in Q4/2020 and onwards.

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

RAN1#103-e agreements

**Mechanisms to support group scheduling for RRC\_CONNECTED UEs**

**Agreements:** For convenience of discussion, consider the following clarification as RAN1 common understanding.

* **PTP transmission**: For RRC\_CONNECTED UEs, use UE-specific PDCCH with CRC scrambled by UE-specific RNTI (e.g., C-RNTI) to schedule UE-specific PDSCH which is scrambled with the same UE-specific RNTI.
* **PTM transmission scheme 1**: For RRC\_CONNECTED UEs in the same MBS group, use group-common PDCCH with CRC scrambled by group-common RNTI to schedule group-common PDSCH which is scrambled with the same group-common RNTI. This scheme can also be called group-common PDCCH based group scheduling scheme.
* **PTM transmission scheme 2**: For RRC\_CONNECTED UEs in the same MBS group, use UE-specific PDCCH with CRC scrambled by UE-specific RNTI (e.g., C-RNTI) to schedule group-common PDSCH which is scrambled with group-common RNTI. This scheme can also be called UE-specific PDCCH based group scheduling scheme.
* Note: The ‘UE-specific PDCCH / PDSCH’ here means the PDCCH / PDSCH can only be identified by the target UE but cannot be identified by the other UEs in the same MBS group with the target UE.
* Note: The ‘group-common PDCCH / PDSCH’ here means the PDCCH / PDSCH are transmitted in the same time/frequency resources and can be identified by all the UEs in the same MBS group.
* FFS whether or not to have additional definition of transmission scheme(s)

Agreements**:** For RRC\_CONNECTED UEs, if initial transmission for multicast is based on PTM transmission scheme 1, at least support retransmission(s) can use PTM transmission scheme 1.

* FFS: whether to support PTP transmission for retransmission(s).
* FFS: whether to support PTM transmission scheme 2 for retransmission(s).
* FFS: How to indicate the association between PTM scheme 1 and PTP transmitting the same TB.
* FFS: If multiple retransmission schemes are supported, then can different retransmission schemes be supported simultaneously for different UEs in the same group?

**Working assumption:**

For multicast of RRC-CONNECTED UEs, a common frequency resource for group-common PDCCH / PDSCH is confined within the frequency resource of a dedicated unicast BWP to support simultaneous reception of unicast and multicast in the same slot

* Down select from the two options for the common frequency resource for group-common PDCCH/ PDSCH
  + Option 2A: The common frequency resource is defined as an MBS specific BWP, which is associated with the dedicated unicast BWP and using the same numerology (SCS and CP)
    - FFS BWP switching is needed between the multicast reception in the MBS specific BWP and unicast reception in its associated dedicated BWP
  + Option 2B: The common frequency resource is defined as an ‘MBS frequency region’ with a number of contiguous PRBs, which is configured within the dedicated unicast BWP.
    - FFS: How to indicate the starting PRB and the length of PRBs of the MBS frequency region
* FFS whether UE can be configured with no unicast reception in the common frequency resource
* FFS on details of the group-common PDCCH / PDSCH configuration
* FFS whether to support more than one common frequency resources per UE / per dedicated unicast BWP subjected to UE capabilities

Agreements: Support TDM between one unicast PDSCH and one group-common PDSCH in a slot based on UE capability for RRC\_CONNECTED UEs.

Agreements: Support SPS group-common PDSCH for MBS for RRC\_CONNECTED UEs

* FFS: use group-common PDCCH or UE-specific PDCCH for SPS group-common PDSCH activation/deactivation
* FFS: whether to support more than one SPS group-common PDSCH configuration per UE
* FFS: whether and how uplink feedback could be configured
* FFS: retransmission of SPS group-common PDSCH

Agreements: For PTM transmission scheme 1, the CORESET for group-common PDCCH is configured within the common frequency resource for group-common PDSCH.

* FFS: number of CORESET(s) for group-common PDCCH within the common frequency resource for group-common PDSCH

Agreements: For search space set of group-common PDCCH of PTM scheme 1 for multicast in RRC\_CONNECTED state, the CCE indexes are common for different UEs in the same MBS group.

Agreements: Down select from the two options for BDs/CCEs limit for Rel-17 MBS

* Option 1: the maximum number of monitored PDCCH candidates and non-overlapped CCEs per slot per serving cell defined in Rel-15 is kept unchanged for Rel-17 MBS.
* Option 2: For UEs supporting CA capability, the budget of BDs/CCEs of an unused CC can be used for group-common PDCCH to count the number of BDs/CCEs, which is similar to the method used for multi-DCI based multi-TRP in Rel-16.

Agreements:For RRC\_CONNECTED UEs, support inter-slot TDM between unicast PDSCH and group-common PDSCH in different slots (mandatory for the UE supporting MBS).

Agreements:Further study the following cases for simultaneous reception of unicast PDSCH and group-common PDSCH in a slot based on UE capability for RRC\_CONNECTED UEs.

* Case 1: support TDM between multiple TDMed unicast PDSCHs and one group-common PDSCH in a slot
* Case 2: support TDM among multiple group-common PDSCHs in a slot
* Case 3: support TDM between multiple TDMed unicast PDSCHs and multiple TDMed group-common PDSCHs in a slot
* Case 4: support FDM between multiple TDMed unicast PDSCHs and multiple TDMed group-common PDSCHs in a slot
* Case 5: support FDM among multiple group-common PDSCHs in a slot
* FFS: maximum number of PDSCHs in a slot simultaneous received per UE

Agreements:For search space set of group-common PDCCH of PTM scheme 1 for multicast in RRC\_CONNECTED state, further study the following options.

* Option 1: Define a new search space type specific for multicast
* Option 2: Reuse the existing CSS type(s) in Rel-15/16
  + FFS: whether modifications are needed for multicast
* Option 3: Reuse the existing USS in Rel-15/16 with necessary modifications for MBS
  + FFS: detailed modifications

Agreements:No specification enhancement in Rel-17 to support SDM between unicast PDSCH and group-common PDSCH in a slot for RRC\_CONNECTED UEs.

Agreements**:** For PTM transmission scheme 1, if Option 2A or Option 2B for common frequency resource for group-common PDCCH/PDSCH is agreed, the FDRA field of group-common PDCCH is interpreted based on the common frequency resource.

Agreements: For search space set of group-common PDCCH of PTM scheme 1 for multicast in RRC\_CONNECTED state, further study the following options for the monitoring priority of search space set

* Option 1: The monitoring priority of search space set for multicast is the same as existing Rel-15/16 CSS
* Option 2: The monitoring priority of search space set for multicast is the same as existing Rel-15/16 USS
* Other options are not precluded
* The monitoring priority is used at least for PDCCH overbooking case
  + FFS for other cases (e.g., to prune PDCCH in terms of whether it’s unicast or multicast, etc.)

**Mechanisms to improve reliability for RRC\_CONNECTED UEs**

Agreements:

For RRC\_CONNECTED UEs receiving multicast, at least for PTM scheme 1, support at least one of the following:

* ACK/NACK based HARQ-ACK feedback for multicast,
  + From per UE perspective, UE feedback ACK or NACK.
  + From UEs within the group perspective,
    - FFS: PUCCH resource configuration for ACK/NACK feedback e.g., shared or separate PUCCH resources.
  + FFS details including conditions for it to be used
* NACK-only based HARQ-ACK feedback for multicast,
  + From per UE perspective, UE only feedback NACK.
  + From UEs within the group perspective~~, further down-select between:~~
    - FFS: PUCCH resource configuration for NACK only feedback.
  + FFS details including conditions for it to be used
* To decide in RAN1#104-e whether or not to support only one or both of the above schemes
  + If both are supported, FFS configuration/selection of ACK/NACK-based and NACK-only based HARQ-ACK feedback

Agreements:

For RRC\_CONNECTED UEs receiving multicast, for ACK/NACK based HARQ-ACK feedback if supported for group-common PDCCH scheduling, PUCCH resource configuration for HARQ-ACK feedback from per UE perspective is, down-select one of the following options:

* Option 1: shared with PUCCH resource configuration for HARQ-ACK feedback for unicast
* Option 2: separate from PUCCH resource configuration for HARQ-ACK feedback for unicast
* Option 3: Option 1 or option 2 based on configuration

Agreements:

For RRC\_CONNECTED UEs receiving multicast, for NACK-only based HARQ-ACK feedback if supported for group-common PDCCH scheduling, PUCCH resource configuration for HARQ-ACK feedback from per UE perspective is separate from PUCCH resource configuration for HARQ-ACK feedback for unicast.

* FFS PUCCH format

Agreements:

Enabling/disabling HARQ-ACK feedback for MBS is supported, further down-select between:

* Option 1: DCI
* Option 2: RRC configures enabling/disabling
* Option 3: RRC configures the enabling/ disabling function and DCI indicates enabling /disabling
* FFS: Option 4: MAC-CE indicates enabling/disabling
* FFS: Option 5: RRC configures the enabling/ disabling function and MAC-CE indicates enabling /disabling

Agreements:

For slot-level repetition for group-common PDSCH of RRC\_CONNECTED UEs, for indicating the repetition number, further down-select among:

* Opt 1: by DCI
* Opt 2: by RRC
* Opt 3: by RRC+DCI
* FFS: Opt 4: by MAC-CE
* FFS: Opt 5: by RRC+MAC-CE
* FFS details for each option.
* FFS further enhancements for configuration of slot-level repetition

Agreements:

From the perspective of RRC\_CONNECTED UEs receiving multicast, at least for PTM scheme 1 initial transmission, retransmission supports, for the purpose of down-selection, options are:

* Option 1: group-common PDCCH scheduled group-common PDSCH
* Option 2: UE-specific PDCCH scheduled PDSCH
  + Alt 1: PDSCH is UE-specific PDSCH
  + Alt 2: PDSCH is group-common PDSCH
* Option 3: both option 1 and option 2
* FFS other options
* FFS CBG based retransmission

Agreements:

FFS whether CSI feedback enhancement is needed for MBS, including but not limited:

* New CQI measurement
* New CSI report formats
* Targeted BLER
* CSI-RS configuration
* A-CSI-RS transmission triggering
* SRS configuration

Agreements:

For ACK/NACK based HARQ-ACK feedback if supported, both Type-1 and Type-2 HARQ-ACK codebook are supported for RRC\_CONNECTED UEs receiving multicast,

* FFS details of HARQ-ACK codebook design.
* FFS whether enhanced Type-2 and/or Type-3 HARQ-ACK codebook is supported or not.

**Basic functions for broadcast/multicast for RRC\_IDLE/RRC\_INACTIVE UEs**

Agreements:For RRC\_IDLE/RRC\_INACTIVE UEs, support group-common PDCCH with CRC scrambled by a common RNTI to schedule a group-common PDSCH, where the scrambling of the group-common PDSCH is based on the same common RNTI.

* FFS details

Agreements:

* For RRC\_IDLE/RRC\_INACTIVE Ues, beam sweeping is supported for group-common PDCCH/PDSCH.
  + FFS: Details for support of beam sweeping for group-common PDCCH/PDSCH.

**Agreements:** For RRC\_IDLE/RRC\_INACTIVE UEs, define/configure common frequency resource(s) for group-common PDCCH/PDSCH.

* the UE may assume the initial BWP as the default common frequency resource for group-common PDCCH/PDSCH, if a specific common frequency resource is not configured.
* FFS: the relation of the common frequency resource(s) (if configured) and initial BWP.
* FFS: whether to configure one/more common frequency resources
* FFS: configuration and definition details of the common frequency resource

**Agreements:** From physical layer perspective, for broadcast reception, the same group-common PDCCH and the corresponding scheduled group-common PDSCH can be received by both RRC\_IDLE/RRC\_INACTIVE UEs and RRC\_CONNECTED UEs.

* FFS details.

 Agreements**:** For RRC\_IDLE/RRC\_INACTIVE UEs, CSS is supported for group-common PDCCH.

* FFS: reuse current CSS type, define a new CSS type, etc.
* FFS other details.

 Agreements: For RRC\_IDLE/RRC\_INACTIVE UEs, a CORESET can be configured within the common frequency resource for group-common PDCCH/PDSCH. CORESET0 is used by default if the common frequency resource for group-common PDCCH/PDSCH is the initial BWP and the CORESET is not configured.

* FFS: configuration details of the CORESET for group-common PDCCH/PDSCH

#### 2.1.2 Remaining Open issues

* Group scheduling mechanism for MBS in RRC\_CONNECTED state, including enhancements to enable simultaneous operation with unicast reception
* Reliability improvement mechanisms for MBS in RRC\_CONNECTED state
* Required changes for MBS in RRC\_IDLE/ RRC\_INACTIVE states

## 2.2 RAN2

#### 2.2.1 Agreements

RAN2#112-e agreements

***Broadcast and multicast sessions support, RRC states and other aspects related to SA2 LS***

* For Rel-17, R2 specifies two *modes*:

**1: One *delivery mode* for high QoS (reliability, latency) requirement, to be available in CONNECTED (possibly the UE can switch to other states when there is no data reception TBD)**

**2: One *delivery mode* for “low” QoS requirement, where the UE can also receive data in INACTIVE/IDLE (details TBD).**

**R2 assumes (for R17) that delivery mode 1 is used only for multicast sessions.**

**R2 assumes that delivery mode 2 is used for broadcast sessions.**

**The applicability of delivery mode 2 to multicast sessions is FFS.**

* No data: When there is no data ongoing for the multicast session, the UE can stay in RRC\_CONNECTED. Other cases FFS
* It is up to SA2 to decide whether the multicast session activation/deactivation mechanism is supported or not, and RAN2 will discuss if there is any RAN2 impacts based on SA2 inputs.
* It is up to SA2 to decide on the support of local MBS service, and RAN2 will discuss the RAN2 impacts based on SA2 inputs.
* In general, Information of MBS services/groups subscribed by the UE (e.g. TMGI) and QOS requirements of a MBS service should be provided to RAN. Detail information e.g. for PTM PTP switch if any is FFS.
* The function of mapping from QoS flows to MBS RBs in SDAP is needed for NR MBS. TBD whether any SDAP header is needed.

***Layer 2 architecture***

* (Working assumption) no SDAP functions other than “mapping from QoS flows to radio bearers” and “transfer of user plane data” are supported for MBS. FFS whether to support QoS flows to radio bearers remapping.
* In general: RAN2 wait for SA3’s progress for discussing security issues. TBD whether we need to send LS to SA3.
* RoHC (at least U-mode) can be configured for NR MBS bearers. This is applicable for Mcast, assume this is applicable also to broadcast.
* RoHC is located at PDCP.
* The reordering and in-order delivery function in PDCP is supported for NR MBS.
* The following PDCP functions are also supported for NR MBS: transfer of data; maintenance of PDCP SNs; duplicate discarding. Other PDCP functions are FFS.
* RLC AM is supported for PTP transmission of NR MBS.
* RLC UM is supported for PTP transmission of NR MBS.
* RLC UM is supported for PTM transmission of NR MBS.
* RLC TM is not supported for PTP transmission of NR MBS.
* RLC TM is not supported for PTM transmission of NR MBS.
* FFS for PTM if multiplexing/de-multiplexing of different logical channels are to be supported in MAC for NR MBS.
* Working assumption: RLC-AM for PTM is not supported (can be revisited but it means that proponents of RLC-AM for PTM need to demonstrate the need, to change this).

***Service continuity***

* R2 aim to support lossless handover for MBS-MBS mobility for service that requires this (TBD which detailed scenario but at least PTP-PTP)
* In order to support the lossless handover for 5G MBS services, at least DL PDCP SN synchronization and continuity between the source cell and the target cell should be guaranteed by the network side to realize. The design of specific approach to realize this can be involved with WG RAN3.
* From network side, the source gNB may forward the data to the target gNB and the target gNB will deliver the forwarding data. Meanwhile, the SN STATUS TRANSFER should be extended to cover the PDCP SN for MBS data; Then (TBD after or in parallel) the UE receives the MBS in the target cell by the target cell according to target configuration.
* From UE side, PDCP status report may be supported as well.

***Idle/Inactive support***

* UE receives the MBS configuration (for broadcast/delivery mode 2) by BCCH and/or MCCH (TBD), and this can be received in Idle / Inactive mode. Connected mode FFS (dep on UE cap and where service is provided etc). A notification mechanism is used to announce the change of MBS Control information.

#### 2.2.2 Remaining Open issues

* Remaining issues for delivery mode 1, including but not limited to:
  + L2 architecture and MBS bearer configuration;
  + Dynamic switch issues (e.g. transparent or any signaling needed);
  + Use cases of PDCP status reporting and retransmission;
  + Remaining issues for lossless support.
* Remaining issues for delivery mode 2, including but not limited to:
  + BCCH and/or MCCH based PTM configuration;
  + PTM configuration change notification.
* RAN2 aspects of group scheduling, including but not limited to:
  + DRX;
  + SPS as agreed by RAN1.

## 2.3 RAN3

#### 2.3.1 Agreements

**RAN3#110-e agreements**

***General***

* Baseline CRs to TS38.300, TS 38.401, TS 38.463, TS 38.423, TS 38.470, and TS 38.410 are endorsed.

***Reply LS to SA2***

* Reply LS to SA2 agreed in R3-207059, provide answers to the SA2 questions, ask SA2 to clarify some aspects for the MBS activation/deactivation, provide feedback about the provision of QoS requirement and feedback that RAN3 will develop protocol support to control both transmission modes for shared N3 transport between the MB-UPF and the NG-RAN.

***Necessary Enhancements to NG-RAN Architecture***

* An NR MBS Session is identified by an NR MBS Session Identifier which is unique within one PLMN
* The following agreements from RAN3#109-e on NR multicast are also applicable for NR broadcast:
  + WA pending SA2 progress (to progress discussion in RAN3):
    - One or more QoS flows may be used within a single MBS session
    - Each MB QoS flow belongs to one MBS Session
    - Each MB QoS flow is associated with a QoS profile
    - NR MBS supports both GBR and non-GBR QoS
    - One Shared NG-U tunnel is used per MBS session.
  + We Define MBS session resource in analogy with PDU session resource, e.g. including radio part, CP part, NG-UP part, MBS context in RAN
  + MBS session resource establishment is requested by 5GC (similarly to the PDU session establishment for unicast)
* 5GC shared MBS traffic delivery: as specified in TS 23.501.
* Agree TPs for 38.300 and 38.401 in R3-206384.

***Session Management over NG***

* Agree to have MBS Session Start/Release procedure for Broadcast but naming is FFS.
* Agree TP for 38410 in R3-207054 to introduce NGAP procedures to support Broadcast.
* Agreed that only PTM applies for broadcast (i.e. no PTP).

***Dynamic Change between PTP and PTM for UEs in RRC\_CONNECTED State***

* Restrict the terms PTP and PTM for RAN internal delivery decision for the various mode. Agreed that for broadcast only PTM is applicable and for Multicast both PTP and PTM are applicable; PTP and PTM definitions need to be further discussed
* PTP and PTM modes can be used simultaneously in the same cell.
* The PTP-PTM Switching function is only applicable for a multicast MBS Session and resides in NG-RAN node. It enables the NG-RAN node to decide for which UEs to use PTP or PTM (PTP, PTM to be defined with RAN2) for the MBS session.
* The NG-RAN node takes its decision based on information such as MBS Session QoS requirements, number of joined UEs, UE individual feedback on reception quality, and other criteria. The same QoS requirements apply regardless of the decision.
* One TP to 38.300 agreed in R3-207055.

***Bearer Management over F1/E1***

* Use a shared F1-U tunnel for PTM transmission of an MBS radio bearer for an MBS Session
* About F1-U transport establishment
  + - * + Support the method that gNB-DU assigns the DL F1-U GTP-U tunnel info, provides it to gNB-CU-CP and then gNB-CU-CP forwards it to gNB-CU-UP.
        + FFS if IP multicast method is supported or not.
* About MBS Context
  + - * + Provide the MBS Session id, QoS profile from gNB-CU to gNB-DU.
        + Provide the MBS Session id, QoS profile from gNB-CU-CP to gNB-CU-UP.
* About MBS Bearer management
  + - * + F1/E1 MBS Bearer management procedure can be discussed, but details on e.g. information to signal are pending RAN2/SA2 progress.
      * One TP to 38.401 agreed in R3-207056.

***MBS Transmission Area***

* Broadcast session is associated with Broadcast service area which is provided by 5GC.
* On NG-C interface, Broadcast service area info (e.g. a list of cell IDs) is indicated in the NGAP MBS session resource signaling, for broadcast sessions. FFS for multicast session.

***Mobility with Service Continuity for UEs in RRC\_CONNECTED State***

***Mobility between MBS Supporting Nodes***

* For multicast, NR MBS shall provide means for minimization of data loss during mobility
* These means may be partly network deployment/implementation partly protocol support
* For multicast, in order to allow the UE to detect loss of data or duplication of data, RAN3 shall continue discussing solutions to support alignment of PDCP SNs in between gNBs.
* (in continuation of last meeting agreements):
  + - * + Xn Handover Request and NG Handover Request message contain MBS context information for the UE.
        + MBS context information within the UE context shall contain all MBS multicast session information the UE has joined.
* (confirming the agreement form last meeting, contained in st2 TP):
  + - * + The MBS configuration decided at target gNB is sent to the UE via the source gNB (details e.g. RRC container etc. pending RAN2 progress).
        + RAN3 will work on concepts to enable coordinated assignment of PDCP SNs to MBS user data packets within a gNB and between gNBs (to be coordinated with RAN2 if needed). Details FFS.
* One TP to 38.300 agreed in R3-207057.

***Mobility between MBS Supporting and non-MBS Supporting Nodes***

* RAN3 to deprioritize any detailed study on mobility between MBS-supporting gNBs and non-MBS-supporting gNBs, with the exception of studying impacts on Session management, until SA2 clarifies requirements and achieves some basic agreements

***Others***

* The discussion on CHO for MBS is deprioritized in R17.
* Proposals for Handover enhancements on reliable and low-latency NR MBS are deprioritized in R17.

***Others***

* Reception of broadcast service is supported in Rel-17 and according to RAN2 agreement, UE RRC state is of no relevance for reception of broadcast.
* Confirm that session management for broadcast services should be discussed in RAN3 (Already covered in AI22.2.2)
* For broadcast services reception, service reception continuity issues should be discussed in RAN3 based on the progress in RAN2.
* Whether the reception of multicast services is supported in idle/ inactive mode and the impact to RAN3, is pending RAN2 progress.

#### 2.3.2 Remaining Open issues

* Session management over NG
* MBS Bearer management over F1 and E1
* Mobility with Service Continuity for UEs in RRC\_CONNECTED State

## 2.4 RAN4

#### 2.4.1 Agreements

#### 2.4.2 Remaining Open issues

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

**RAN1#103-E contributions:**

1. R1-2008033 Updated NR MBS work plan CMCC
2. R1-2008940 Summary#1 on mechanisms to support group scheduling for RRC\_CONNECTED UEs for NR MBS Moderator (CMCC)
3. R1-2009504 Summary#2 on mechanisms to support group scheduling for RRC\_CONNECTED UEs for NR MBS Moderator (CMCC)
4. R1-2009573 Summary#3 on mechanisms to support group scheduling for RRC\_CONNECTED UEs for NR MBS Moderator (CMCC)
5. R1-2009629 Summary#4 on mechanisms to support group scheduling for RRC\_CONNECTED UEs for NR MBS
6. R1-2009677 Summary#5 on mechanisms to support group scheduling for RRC\_CONNECTED UEs for NR MBS Moderator (CMCC)
7. R1-2009744 Summary#6 on mechanisms to support group scheduling for RRC\_CONNECTED UEs for NR MBS Moderator (CMCC)
8. R1-2008034 Discussion on group scheduling mechanisms CMCC
9. R1-2007556 Group scheduling for MC/BC services FUTUREWEI
10. R1-2007562 Resource configuration and group scheduling for RRC\_CONNECTED UEs Huawei, HiSilicon
11. R1-2007637 Group scheduling for RRC\_CONNECTED UEs CHENGDU TD TECH LTD.
12. R1-2007691 Discussion on mechanisms to support group scheduling for RRC\_CONNECTED UEs vivo
13. R1-2007835 Discussion on group scheduling mechanism for RRC\_CONNECTED UEs in MBS CATT
14. R1-2008064 Support of group scheduling for RRC\_CONNECTED UEs LG Electronics
15. R1-2008192 On mechanisms to support group scheduling for RRC\_CONNECTED UEs Samsung
16. R1-2008242 Group scheduling for NR Multicast and Broadcast Services OPPO
17. R1-2008375 Considerations on MBMS group scheduling for RRC\_CONNECTED UEs Sony
18. R1-2008449 Discussion on group scheduling mechanism for RRC\_connected UEs Apple
19. R1-2008826 Mechanisms to Support Group Scheduling for RRC\_CONNECTED UEs ZTE
20. R1-2008833 Discussion on mechanisms to support group scheduling for RRC\_CONNECTED UEs ETRI
21. R1-2008882 Group Scheduling Mechanisms to Support 5G Multicast / Broadcast Services for RRC\_CONNECTED UEs Nokia, Nokia Shanghai Bell
22. R1-2008926 Discussion on group scheduling mechanism for NR MBS Lenovo, Motorola Mobility
23. R1-2008961 Discussion on NR MBS group scheduling for RRC\_CONNECTED UEs MediaTek Inc.
24. R1-2009000 Group Scheduling for NR-MBS Intel Corporation
25. R1-2009055 Discussion on mechanisms to support group scheduling for RRC\_CONNECTED UEs Asia Pacific Telecom co. Ltd
26. R1-2009165 On group scheduling mechanism for NR multicast and broadcast Convida Wireless
27. R1-2009238 On Optimal Multiplexing for Simultaneous Operation of Broadcast/Multicast and Unicast Services BBC
28. R1-2009274 Views on group scheduling for Multicast RRC\_CONNECTED UEs Qualcomm Incorporated
29. R1-2009305 Mechanisms to support group scheduling for RRC\_CONNECTED Ues Ericsson
30. R1-2009464 FL summary on improving reliability for MBS for RRC\_CONNECTED UEs Moderator (Huawei)
31. R1-2009539 FL summary#2 on improving reliability for MBS for RRC\_CONNECTED UEs Moderator (Huawei)
32. R1-2009654 FL summary#3 on improving reliability for MBS for RRC\_CONNECTED UEs Moderator (Huawei)
33. R1-2009716 FL summary#4 on improving reliability for MBS for RRC\_CONNECTED UEs Moderator (Huawei)
34. R1-2009275 Views on reliability enhancement for Multicast RRC\_CONNECTED UEs Qualcomm Incorporated
35. R1-2007557 Improving reliability for MC/BC services FUTUREWEI
36. R1-2007563 Mechanisms to improve reliablity for RRC\_CONNECTED UEs Huawei, HiSilicon
37. R1-2007638 Study on the reliability for RRC\_CONNNECTED UEs CHENGDU TD TECH LTD.
38. R1-2007692 Discussion on mechanisms to improve reliability for RRC\_CONNECTED UEs vivo
39. R1-2007836 Discussion on reliability improvement mechanism for RRC\_CONNECTED UEs in MBS CATT
40. R1-2008035 Discussion on reliability improvement CMCC
41. R1-2008065 Mechanisms to improve reliability of Broadcast/Multicast service LG Electronics
42. R1-2008193 On mechanisms to improve reliability for RRC\_CONNECTED UEs Samsung
43. R1-2008243 UL feedback for RRC-CONNECTED UEs in MBMS OPPO
44. R1-2008450 Discussion on MBS reliability improvement for RRC\_connected UEs Apple
45. R1-2008715 Reliability improvement for RRC\_CONNECTED UEs in MBS Potevio
46. R1-2008827 Mechanisms to Improve Reliability for RRC\_CONNECTED UEs ZTE
47. R1-2008883 Reliability Improvements for RRC\_CONNECTED UEs Nokia, Nokia Shanghai Bell
48. R1-2008893 Views on improving reliability for RRC\_CONNECTED UEs in MBS Google Inc.
49. R1-2008927 Discussion on reliability improvement for RRC-CONNECTED UEs Lenovo, Motorola Mobility
50. R1-2008962 Discussion on HARQ operation for NR MBS reliable transmission MediaTek Inc.
51. R1-2009001 Mechanisms to Improve Reliability for NR-MBS Intel Corporation
52. R1-2009166 On reliability enhancement for NR multicast and broadcast Convida Wireless
53. R1-2009306 Discussion on reliability mechanisms for NR MBS Ericsson
54. R1-2009465 Feature lead summary on RAN basic functions for broadcast/multicast for UEs in RRC\_IDLE/ RRC\_INACTIVE states Moderator (BBC)
55. R1-2009553 Summary#2 on RAN basic functions for broadcast/multicast for UEs in RRC\_IDLE/ RRC\_INACTIVE states Moderator (BBC)
56. R1-2009554 Summary#3 on RAN basic functions for broadcast/multicast for UEs in RRC\_IDLE/ RRC\_INACTIVE states Moderator (BBC)
57. R1-2007837 Discussion on basic functions for broadcast/multicast for RRC\_IDLE/RRC\_INACTIVE UEs CATT, CBN
58. R1-2007564 Discussion on multicast support for IDLE/INACTIVE UEs Huawei, HiSilicon
59. R1-2007639 Basic functions for MBS for RRC\_IDLE/RRC\_INACTIVE UEs CHENGDU TD TECH LTD.
60. R1-2007693 Discussion on basic functions for broadcast/multicast for RRC\_IDLE/RRC\_INACTIVE Ues vivo
61. R1-2008036 Discussion on NR MBS in RRC\_IDLE/RRC\_INACTIVE states CMCC
62. R1-2008066 Basic function for broadcast/multicast LG Electronics
63. R1-2008194 On basic functions for broadcast/multicast for RRC\_IDLE/RRC\_INACTIVE UEs Samsung
64. R1-2008244 Discussion on enhancements for IDLE and INACTIVE state UEs OPPO
65. R1-2008828 Basic Functions for Broadcast or Multicast for RRC\_IDLE or RRC\_INACTIVE UEs ZTE
66. R1-2008884 Basic Functions for Broadcast / Multicast for RRC\_IDLE / RRC\_INACTIVE UEs Nokia, Nokia Shanghai Bell
67. R1-2008928 Basic functions for broadcast/multicast in idle/inactive states Lenovo, Motorola Mobility
68. R1-2009002 NR-MBS for RRC\_IDLE/INACTIVE UEs Intel Corporation
69. R1-2009167 On NR multicast and broadcast for RRC\_IDLE/RRC\_INACTIVE UEs Convida Wireless
70. R1-2009276 Discussion on broadcast/multicast for RRC\_IDLE/RRC\_INACTIVE UEs Qualcomm Incorporated
71. R1-2009307 Support for NR multicast reception in RRC Inactive/Idle Ericsson
72. R1-2007641 Effects of NR MBS on PDSCH and PDCCH CHENGDU TD TECH LTD.
73. R1-2007694 Other issues for Rel-17 MBS vivo
74. R1-2007838 Discussion on search space type definition for group scheduling CATT
75. R1-2008067 Other aspects for MBS LG Electronics
76. R1-2008245 PUCCH resource allocation for UL feedback in MBMS OPPO
77. R1-2008317 Resource for receiving MBS Huawei, HiSilicon
78. R1-2008829 Preliminary Simulation Results of Rel-17 MBS ZTE
79. R1-2009308 Assumptions for Performance Evaluations of NR-MBS Ericsson

**RAN2#112-e contributions:**

1. R2-2008751 Reply LS on RAN impact of FS\_5MBS Study (RP-202086; contact: Huawei) RAN
2. R2-2008755 LS on RAN impact of FS\_5MBS Study (S2-2006044; contact: Huawei) SA2
3. R2-2008768 Reply LS on RAN impact of FS\_5MBS Study (SP-200884; contact: Huawei) SA
4. R2-2008791 Discussion on Requirement and Architecture of MBS CATT
5. R2-2008792 Reliability Enhancement for PTM Transmission CATT
6. R2-2008793 Open Issues on Dynamic PTM and PTP Switch CATT
7. R2-2008794 Open Issues on Mobility with Service Continuity CATT
8. R2-2008795 Discussion on Miscellaneous Issues CATT
9. R2-2008796 Summary of Email Discussion Post111-e906 MBS Idle mode support CATT
10. R2-2008797 Further Discussion on MBS Idle Mode Support CATT, CBN
11. R2-2008865 Considerations on Protocol stack and network architecture OPPO
12. R2-2008866 Discussion on reliability for MBS reception OPPO
13. R2-2008867 Dynamic PTM and PTP switching with service continuity OPPO
14. R2-2008868 Discussion on mobility with MBS Service continuity OPPO
15. R2-2008869 Discussion on MBS reception of idle or inactive mode UE OPPO
16. R2-2008874 Discussion on group-based scheduling for MBS OPPO
17. R2-2008929 Discussioin on the protocol stack for NR MBS CHENGDU TD TECH LTD.
18. R2-2008930 Dynamic switch between PTM and PTP with service continuity CHENGDU TD TECH LTD.
19. R2-2008931 Discussion on mobility with service continuity CHENGDU TD TECH LTD.
20. R2-2008932 Consideration on reliability for NR MBS CHENGDU TD TECH LTD.
21. R2-2008933 NR MBS for RRC\_IDLE/RRC\_INACTIVE UE CHENGDU TD TECH LTD.
22. R2-2008934 RAN2 related aspects for NR MBS CHENGDU TD TECH LTD.
23. R2-2008940 IDLE/INACTIVE UE support for NR MBS TCL Communication Ltd.
24. R2-2008945 Reliability and latency handling during NR multicast mobility TCL Communication Ltd.
25. R2-2008989 Dynamic switch between PTM and PTP for service continuity Intel Corporation
26. R2-2008990 MBS service continuity in mobility Intel Corporation
27. R2-2008991 MBS support for IDLE and INACTIVE states Intel Corporation
28. R2-2009034 NR Multicast PTM bearer RLC AM mode operation Qualcomm Inc, British Telecom, Kyocera, FirstNet, AT&T
29. R2-2009035 NR Multicast Broadcast mobility enhancements with service continuity Qualcomm Inc
30. R2-2009036 NR Multicast Vs Broadcast comparison and Radio Bearer Architecture aspects Qualcomm Inc
31. R2-2009037 Enhancements for supporting loss less PTM PTP switching Qualcomm Inc
32. R2-2009038 NR Multicast-Broadcast services and configuration for UEs in different RRC states Qualcomm Inc
33. R2-2009054 HO for NR MBS MediaTek Inc.
34. R2-2009103 Consideration on PTP/PTM switching Shanghai Jiao Tong University
35. R2-2009126 HARQ operation for NR MBS reliable transmission MediaTek Inc.
36. R2-2009127 Dynamic PTM-PTP switch MediaTek Inc.
37. R2-2009128 NR MBS Radio Bearer Structure MediaTek Inc.
38. R2-2009154 Discussion on reliability of MBS service Spreadtrum Communications
39. R2-2009155 Discussion on dynamic PTM PTP switch Spreadtrum Communications
40. R2-2009156 Discussion on sevice continuity during mobility Spreadtrum Communications
41. R2-2009157 MBS for Idle and Inactive mode UE Spreadtrum Communications
42. R2-2009196 MBS L2 Architecture, user plane and control plane Intel Corporation
43. R2-2009197 MBS service reliability improvement Intel Corporation
44. R2-2009283 Discussion on NR MBS structure allowing service for idle UEs Futurewei
45. R2-2009303 MBS Protocol Architecture and Logical Channel Aggregation Futurewei
46. R2-2009304 ARQ of PTM with Logical Channel Aggregation Futurewei
47. R2-2009305 Service Continuity during Dynamic PTM/PTP Switch with Logical Channel Aggregation Futurewei
48. R2-2009313 PDCP Operation for MBS Nokia, Nokia Shanghai Bell
49. R2-2009314 MBS split bearer configuration and PTP/PTM switching Nokia, Nokia Shanghai Bell
50. R2-2009315 Miscellaneous Aspects of MBS Nokia, Nokia Shanghai Bell
51. R2-2009319 Consideration on MBS support in idle/inactive modes ETRI
52. R2-2009320 Discussion on RAN level QoS handling for MBS service area TCL Communication Ltd.
53. R2-2009334 Updated NR MBS workplan Huawei, CMCC, HiSilicon
54. R2-2009335 Discussion on SA2 LS on RAN impact of FS\_5MBS Study Huawei, HiSilicon
55. R2-2009336 Draft reply LS to SA2 on RAN impact of FS\_5MBS Study Huawei, HiSilicon
56. R2-2009337 Summary of Email discussion Post111-e-904 MBS L2 Architecture Huawei, HiSilicon
57. R2-2009338 Reliability enhancement for NR MBS Huawei, HiSilicon
58. R2-2009339 Support of dynamic switch between PTP and PTM Huawei, HiSilicon
59. R2-2009340 Service continuity during inter-cell mobility Huawei, HiSilicon
60. R2-2009341 General aspects for NR MBS Huawei, HiSilicon
61. R2-2009342 RRC states for MBS reception and Idle/Inactive UE support Huawei, HiSilicon
62. R2-2009343 38.300 running CR for NR MBS Huawei, HiSilicon
63. R2-2009440 Dynamic PTP PTM switch LG Electronics Inc.
64. R2-2009441 MBS in IDLEI NACTIVE LG Electronics Inc.
65. R2-2009444 MBS service continuity LG Electronics Inc.
66. R2-2009445 Consideration on properties of NR for multicastbroadcast LG Electronics Inc.
67. R2-2009461 General Considerations on Mobility with Service Continuity Samsung R&D Institute India
68. R2-2009494 Consideration on MBS transmission reliability Apple
69. R2-2009495 PTM PTP switch with MBS service continuity Apple
70. R2-2009496 Mobility with MBS service continuity Apple
71. R2-2009497 MBS reception in CONNECTED state Apple
72. R2-2009498 MBS reception in IDLE/INACTIVE state Apple
73. R2-2009537 Group Scheduling and Multiplexing Aspects Samsung R&D Institute India
74. R2-2009555 IDLE and INACTIVE state UE operation Nokia, Nokia Shanghai Bell
75. R2-2009575 Reliable MBS Transmission Sharp
76. R2-2009576 Dynamic switch between PTP and PTM Sharp
77. R2-2009579 Discussion on introducing counting and UE interest indication mechanism for UE in idle/inactive mode China Unicom
78. R2-2009600 Reliability Enhancements for NR MBS Samsung
79. R2-2009601 PTM PTP Switching and MBS Bearer Type Samsung
80. R2-2009611 IDLE /IN\_ACTIVE UE support of MBS NEC
81. R2-2009612 Reliability of NR MBS NEC
82. R2-2009613 Service Continuity for Connected mode UE NEC
83. R2-2009614 Simultaneous transmission of multicast/unicast NEC
84. R2-2009641 Discussion on the counting scheme for dynamically switching PTM and PTP ITRI
85. R2-2009668 Framework for NR MBS Broadcast and Multicast services Lenovo, Motorola Mobility
86. R2-2009673 Clarification on the dynamic switching in MAC Beijing Xiaomi Mobile Software
87. R2-2009674 UE assistance information for connected mobility Beijing Xiaomi Mobile Software
88. R2-2009740 L2 architecture for NR MBS ZTE, Sanechips
89. R2-2009741 Consideration on MBS reliability guarantee ZTE, Sanechips
90. R2-2009742 Dynamic mode switching for NR MBS ZTE, Sanechips
91. R2-2009743 Consideration on lossless handover for NR MBS ZTE, Sanechips
92. R2-2009744 Support of Idle and Inactive mode UEs for NR MBS ZTE, Sanechips
93. R2-2009822 draft\_Reply LS on RAN impact of FS\_5MBS Study ZTE, Sanechips
94. R2-2009879 On HARQ and RLC for 5G MBS reliability Lenovo, Motorola Mobility
95. R2-2009880 5G MBS dynamic switch between PTP and PTM with service continuity Lenovo, Motorola Mobility
96. R2-2009881 Connected Mode Mobility with Service Continuity Lenovo, Motorola Mobility
97. R2-2009883 Security for PTP and PTM switching Sony
98. R2-2009884 PTP/PTM MRB and RLM Sony
99. R2-2009902 Open issues on MBS idle mode support MediaTek Inc.
100. R2-2009953 MBS reception in Idle and Inactive mode Ericsson
101. R2-2009954 SA2 questions about RRC state transitions for multicast Ericsson
102. R2-2009959 PTM to PTP Dynamic Switch Ericsson
103. R2-2009960 Mobility for NR MBS Ericsson
104. R2-2009961 Reliability for multicast operation Ericsson
105. R2-2009962 Aspects of Group Sscheduling Ericsson
106. R2-2010064 On Stage-2 aspects and overview of NR MBS Samsung
107. R2-2010078 RRC IDLE/ INACTIVE aspects of NR MBS Samsung
108. R2-2010139 Dynamic PTM/PTP Switching Convida Wireless
109. R2-2010143 MBS Mobility Management Nokia, Nokia Shanghai Bell
110. R2-2010145 On NR multicast and broadcast for RRC\_IDLE/RRC\_INACTIVE UEs Convida Wireless
111. R2-2010160 On reliability enhancement for NR multicast and broadcast Convida Wireless
112. R2-2010214 General considerations on NR MBS vivo
113. R2-2010215 Discussion reliability for RRC\_CONNECTED UEs vivo
114. R2-2010216 Dynamic PTM PTP switch for RRC Connected UE vivo
115. R2-2010217 MBS Service Continuity for RRC Connected UE vivo
116. R2-2010218 Control of transmission area and group scheduling vivo
117. R2-2010219 Discussion on Idle and Inactive mode UEs vivo
118. R2-2010234 Consideration of control plane aspects for NR MBS Kyocera
119. R2-2010382 Consideration on Reliability Enhancement for MBS CMCC
120. R2-2010383 Discussion on Dynamic PTM PTP switch with service continuity CMCC
121. R2-2010384 Discussion on Mobility with Service Continuity CMCC
122. R2-2010385 Summary of [Post111-e][905][MBS] Connected Mode Mobility with Service Continuity (CMCC) CMCC
123. R2-2010386 Discussion on Beam Level MBS Deployment CMCC
124. R2-2010387 Discussion on Idle and Inactive UE MBS Reception CMCC
125. R2-2010411 Discussion on user-plane channel structure for MBS LG Electronics Inc.
126. R2-2010412 Discussion on reliability improvement and UL feedback in NR multicast LG Electronics Inc.
127. R2-2010643 Discussion on UE mode in CONNECTED states TD Tech
128. R2-2010644 Discussion on MBS support for UE in IDLE and INACTIVE states TD Tech
129. R2-2011022 Summary of [AT112-e][036][MBS] SA2 LS on MBS Huawei, HiSilicon
130. R2-2011133 Draft reply LS to SA2 on RAN impact of FS\_5MBS Study Huawei, HiSilicon
131. R2-2011170 [DRAFT] Reply LS on RAN impact of FS\_5MBS Study Huawei, HiSilicon
132. R2-2011271 Reply LS on RAN impact of FS\_5MBS Study RAN2

**RAN3#110-e contributions:**

1. R3-205907 Introduction of NR MBS Nokia, Nokia Shanghai Bell draftCR
2. R3-205909 Introduction of NR MBS Huawei, CMCC CR
3. R3-205982 Discussion on NR MBS architecutre CHENGDU TD TECH LTD. discussion
4. R3-206027 MBS bearer setup in F1 and E1 Samsung discussion
5. R3-206028 TP for MBS BLCR for 38.473-Addition of MBS feature Samsung other
6. R3-206029 Dynamic Change Between PTP and PTM Samsung discussion
7. R3-206030 Mobility Between MBS Supporting Nodes Samsung discussion
8. R3-206031 TP for MBS BLCR for 38.413-Session Management over NG Samsung other
9. R3-206058 Dynamic switch between PTM and PTP for RRC\_CONNECTED UE CHENGDU TD TECH LTD. discussion
10. R3-206059 Mobility between MBS supporting nodes CHENGDU TD TECH LTD. discussion
11. R3-206060 Mobility between an MBS supporting node and a NON-MBS supporting node CHENGDU TD TECH LTD. discussion
12. R3-206176 Session management procedure Qualcomm Incorporated discussion
13. R3-206177 Loss-less handover procedure for NR multicast Qualcomm Incorporated discussion
14. R3-206207 MBS assistance information Intel Deutschland GmbH discussion
15. R3-206244 Enhancement to NG-RAN architecture for MBS Nokia, Nokia Shanghai Bell other
16. R3-206245 MBS Stage 2 for Session management Nokia, Nokia Shanghai Bell other
17. R3-206247 MBS Session management for joining/leaving Nokia, Nokia Shanghai Bell other
18. R3-206248 MBS Session Management for NG-U resources setup Nokia, Nokia Shanghai Bell other
19. R3-206250 MBS Stage 2 for PTP-PTM Switching Nokia, Nokia Shanghai Bell other
20. R3-206251 MBS to MBS Mobility Key Principles Nokia, Nokia Shanghai Bell other
21. R3-206252 MBS Stage 2 for Mobility Management Nokia, Nokia Shanghai Bell other
22. R3-206253 MBS Mobility Control Plane Nokia, Nokia Shanghai Bell other
23. R3-206254 Support of MBS Seamless Mobility Nokia, Nokia Shanghai Bell other
24. R3-206299 Discussion on dynamic change between PTM and PTP CATT discussion
25. R3-206300 Discussion on general principle for MBS service continuity CATT discussion
26. R3-206301 Possible solutions to minimise data loss CATT discussion
27. R3-206302 TP on TS 38.300 on MBS service continuity CATT other
28. R3-206304 Minimising data loss on handover from non-MBS gNB toward MBS gNB CATT discussion
29. R3-206305 Service continuity from MBS gNB toward non-MBS gNB CATT discussion
30. R3-206306 Some Issues on Architecture of MBS CATT discussion
31. R3-206307 Consideration on MBS Transmission Area CATT discussion
32. R3-206309 MBS reception of Idle and In-active Ues CATT discussion
33. R3-206310 Discussion on NG session management CATT,CBN discussion
34. R3-206311 Draft LS to SA2 on multicast service area CATT LS out
35. R3-206312 Introduction of MBS(BL CR for 38.463) CATT CR
36. R3-206383 Introduction of NR Multicast and Broadcast Services Ericsson CR
37. R3-206384 [TP for BL CR 38.300/38.401] Capturing agreements on NG-RAN architecture for 5G MBS Ericsson other
38. R3-206385 [TP for BL CR 38.300] Session Management for NR MBS Ericsson other
39. R3-206386 [TP for NGAP BL CR] - MBS Session Resource Management for NR MBS Ericsson other
40. R3-206387 [TP for BL CR 38.300] Further Aspects of Dynamic PTP/PTM change for RRC\_CONNECTED Ues Ericsson other
41. R3-206388 On F1/E1 bearer management aspects Ericsson discussion
42. R3-206389 On 5G MBS Service Area Ericsson discussion
43. R3-206390 Minimization of data loss at mobility between MBS supporting nodes Ericsson discussion
44. R3-206391 [TP for BL CR 38.413] Session control for Xn and NG based mobility Ericsson other
45. R3-206392 [TP for BL CR XnAP] Session Control for Xn mobility Ericsson other
46. R3-206393 Session control for Xn and NG based mobility - interworking with NG-RAN nodes not supporting MBS Ericsson discussion
47. R3-206394 [TP for BL CR 38.413] Session control for Xn based mobility - interworking with NG-RAN nodes not supporting MBS Ericsson other
48. R3-206395 Further aspects for Session control signalling design - Dual Connectivity Ericsson discussion
49. R3-206396 IDLE and INACTIVE Support for NR MBS Ericsson discussion
50. R3-206408 (TP to TS 38.300 BL CR) Inclusion of the agreements of RAN3#109 Huawei other
51. R3-206409 (TP to TS 38.401 BL CR) Inclusion of the agreements of RAN3#109 Huawei other
52. R3-206410 [DRAFT] Reply LS on LS on RAN impact of FS\_5MBS Study Huawei LS out
53. R3-206411 (TP to TS 38.410 BL CR) Session Management over NGAP Huawei other
54. R3-206412 (TP to TS 38.401 BL CR) Decision on PTP and PTM Huawei other
55. R3-206413 (TP to TS 38.401 BL CR) Bearer management over F1 and E1 Huawei other
56. R3-206414 (TP to TS 38.470 BL CR) Bearer management over F1 interface Huawei other
57. R3-206415 (TP to TS 38.460 BL CR) Bearer management over E1 interface Huawei other
58. R3-206416 (TP to TS 38.300 BL CR) Mobility procedure between MBS supporting nodes Huawei other
59. R3-206417 (TP to TS 38.401 BL CR) Mobility procedure between MBS supporting nodes Huawei other
60. R3-206418 Minimize Data Loss during Mobility between MBS supporting nodes Huawei discussion
61. R3-206419 [DRAFT] LS on minimizing data loss during MBS mobility Huawei LS out
62. R3-206420 Mobility between MBS supporting and non-supporting nodes Huawei discussion
63. R3-206421 (TP to TS 38.410 BL CR) Support of Broadcast in NR MBS Huawei other
64. R3-206483 Provisioning of Broadcast Services in RAN Lenovo, Motorola Mobility discussion
65. R3-206484 Introduction of NR MBS Lenovo, Motorola Mobility CR
66. R3-206485 Shared Delivery over F1-U for 5G MBS Lenovo, Motorola Mobility discussion
67. R3-206486 MBS Session Management over NG interface Lenovo, Motorola Mobility discussion
68. R3-206487 Configuration and Dynamic switch between PTP and PTM Lenovo, Motorola Mobility discussion
69. R3-206488 5G MBS Transmission Mode and Area Control within NG-RAN Lenovo, Motorola Mobility discussion
70. R3-206489 PDCP Count Value Synchronization and Data Forwarding Lenovo, Motorola Mobility discussion
71. R3-206490 Support CHO for NR MBS with Service Continuity Lenovo, Motorola Mobility discussion
72. R3-206526 MBS BL CR for TS38.410 ZTE CR
73. R3-206527 Discussion on MBS session management ZTE discussion
74. R3-206528 Dynamic mode switching for NR MBS ZTE discussion
75. R3-206529 Bearer Management for NR MBS ZTE discussion
76. R3-206530 Discussion on multicast & broadcast transmission area ZTE discussion
77. R3-206531 Consideration on MBS mobility procedure ZTE discussion
78. R3-206532 Consideration on lossless handover for NR MBS ZTE discussion
79. R3-206533 Discussion on UE mobility between an MBS-supporting gNB and a non-MBS-supporting gNB ZTE discussion
80. R3-206534 Discussion on Broadcast service continuity in NR MBS ZTE discussion
81. R3-206556 Discussion on support of reliable and low-latency NR multicast mobility TCL Communication Ltd. discussion
82. R3-206650 Issues on dynamic change between PTP and PTM LG Electronics discussion
83. R3-206747 Consideration on Bearer Type Change for MBS Mobility LG Electronics discussion
84. R3-206776 Consideration on Dynamic Control of the Broadcast/Multicast Transmission Area LG Electronics discussion
85. R3-206784 On NG-RAN Architecture for 5G MBS CMCC discussion
86. R3-206785 Session management over NG interface CMCC discussion
87. R3-206802 Discussion on Mobility with Service continuity CMCC discussion
88. R3-206835 Consideration on MBS context management over F1 and E1 CATT discussion
89. R3-206862 CB: # 23\_NTN\_RegUpdate\_and\_Paging - Summary of email discussion Huawei - moderator discussion
90. R3-206863 CB: # 21\_NTN\_CellRelation - Summary of email discussion ZTE - moderator discussion
91. R3-206865 CB: # 20\_NTNcountry\_specific\_routing - Summary of email discussion China Telecom, Qualcomm - moderator discussion
92. R3-206904 CB: # 28\_MBS\_general - Summary of email discussion Huawei - moderator discussion
93. R3-206906 CB: # 57\_MBS\_LSs - Summary of email discussion Nokia - moderator discussion
94. R3-206907 CB: # 58\_MBSarch - Summary of email discussion Ericsson - moderator discussion
95. R3-206908 CB: # 59\_MBSsessionMgmt\_NG - Summary of email discussion Nokia - moderator discussion
96. R3-206909 CB: # 60\_MBS\_PTP-PTMdynChg - Summary of email discussion Nokia - moderator discussion
97. R3-206910 CB: # 61\_MBS\_F1-E1bearerMgmt - Summary of email discussion Huawei - moderator discussion
98. R3-206912 CB: # 63\_MBSmobility\_supporting\_nodes - Summary of email discussion Ericsson - moderator discussion
99. R3-206913 CB: # 64\_MBSmobility\_non-supporting\_nodes - Summary of email discussion ZTE - moderator discussion
100. R3-206914 CB: # 65\_MBSmobility\_AOB - Summary of email discussion Lenovo - moderato discussion
101. R3-206915 CB: # 66\_MBS\_AOB - Summary of email discussion CATT - moderator discussion

20.04.2020 minor adaptations for RAN #88e

18.02.2020 minor adaptations for RAN #87e

14.11.2019 minor adaptations for RAN #86

18.08.2019 minor adaptations for RAN #85

12.05.2019 minor adaptations for RAN #84

27.02.2019 minor adaptations for RAN #83

21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template