**3GPP TSG-RAN WG3 Meeting #114bis-e *R3-221170***

**E-meeting, 17-26 Jan 2022**

**Agenda item: 22.2.2**

**Source: ZTE**

**Title:** **(TP for TS 38.300) Multicast Session Management**

**Document for: Approval**

1. Introduction

This contribution provides TP for BL CR of TS 38.300.

1. TP for TS38.300

16.x.5 Multicast Handling

16.x.5.1 Session Management

The 5GC initiates PDU Session Setup procedure including multicast session information and PDU session setup information with NG-RAN node to setup MBS related resources for one or multiple multicast sessions. The 5GC initiates PDU Session Modify procedure including multicast session information and PDU session modify information with NG-RAN node to setup, modify, or release MBS related resources for one or multiple multicast sessions.

There are two delivery modes as specified in TS 23.501[X].

- MBS shared delivery mode

- MBS individual delivery mode

In MBS shared delivery mode, the MBS context for a multicast session is setup in the NG-RAN node when the first UE joins the multicast session in the NG-RAN node and is released when the last UE leaves the multicast session in this NG-RAN node.

In MBS shared delivery mode, shared NG-U resources are used. The NG-RAN node initiates Multicast Distribution Establishment procedure with 5GC, to allocate shared NG-U resources for a multicast session, or for one area session of a location dependent multicast session. The NG-RAN node initiates Multicast Distribution Release procedure with 5GC, to release the established shared NG-U resources for a given multicast session, or for one given area session of a multicast session. The shared NG-U resources consist of one shared NG-U tunnel per multicast session or per area session of a location dependent multicast session which can be one of the following types:

- one shared GTP-U tunnel per NG-RAN node if unicast transport is used.

- one shared GTP-U tunnel across all involved NG-RAN nodes if multicast transport is used.

The 5GC initiates Multicast Session Update procedure with NG-RAN node to update session information for a multicast session, or an area session of a location dependent multicast session.

The 5GC initiates Multicast Session Activation procedure to notice NG-RAN node the activation of a multicast session and initiates Multicast Session Deactivation procedure to notice NG-RAN node the deactivation of a multicast session.

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1. Annex A: RAN3#113\_e agreements on MBS Session Management

RAN3 continue the work based on current SA2 agreements, if any issues identified in RAN3 later, LS coordination or companies’ internal coordination with other groups are allowed.

mapped QoS flows: unicast QoS flows requested to be established, i.e. included in the legacy QoS flow lists in a way, that non-support RAN nodes would attempt to establish unicast QoS flows and supporting RAN nodes can identify them as mapped QoS flows based on the associated QoS information.

associated QoS flow information: information encompassing: QoS flow QoS parameters for associated QoS flows and mapping information between mapped (unicast) QoS flows and associated QoS flows. The respective information is included in a way that non-supporting RAN nodes would not establish respective RAN resources irrespective the multicast session state.

The reference to the MBS Session which the UE has joined. and, if applicable, the associated QoS flow information~~s~~, are included in the corresponding ~~a~~ PDU Session Resources Item and maintained within the NG-RAN UE Context during active and de-activated MBS sessions. If the (supporting) gNB identifies QoS flows requested to be setup as mapped QoS flows based on information contained in the associated QoS flow information the (supporting) gNB shall not establish unicast resources for those QoS flows. At Xn handover, during an active multicast session, if interworking with non-supporting gNBs is supported in the network, the source node includes both associated QoS flow information and mapped QoS flows within the UE Context in the Handover Request message.

**NG RAN MBS Session Resource Context**: Encompasses CP and UP, transport and radio resources to support an MBS Session. For multicast it encompasses also the MBS Session state (active, de-activated) information about joined UEs.

Define a gNB triggered class 1 procedure to trigger the setup of NG-U resources.

The main application of this procedure is related to setup of NG-U resources.

If an MBS Session Resource within a gNB serves multiple MBS service areas, the same NG MBS Session Resource context may be associated with multiple NG-U resources.

During an ongoing multicast session, NG-U resources maybe setup or released upon UE mobility by means of a gNB triggered procedure.

Introduce a new class 2 procedure for multicast MBS Group Paging in NGAP and XnAP as Multicast Group paging (NGAP) and RAN Multicast Group Paging (XnAP) respectively~~. name and content FFS~~.

The NGAP Multicast Group Paging procedure shall carry the following information: MBS Session ID, MBS Service Area(s), a list of (UE specific paging Identity/Identities or a derived identity/identities. FFS: how to deal with (UE specific) DRX information.

Introduce MBS Session and Associated QoS flow information on highest PDU Session information level containing:

- MBS Session ID.

- MBS QoS flow ID

- MBS QoS flow QoS parameters

- mapped QoS flow ID information

Dependent on the transparent SMF PDU Session container where such information is included, addition, modification and release of such information is supported.

Include “MBS support information” in relevant NGAP SMF containers which informs the SMF whether the gNB has understood the Rel-17 MBS related information.

It is proposed that the “MBS support information” is encoded as an enumeration with one value, e.g. “support”.

Handling of “MBS support information” in the relevant SMF containers at handover from non-supporting to supporting gNBs: the supporting RAN node will include the “MBS support information” within transparent SMF containers of all established PDU Session Resources.

1. Annex B: RAN3#114\_e agreements on MBS Session Management

**Multicast Session Management**

**About providing mapped QoS flow and associated QoS flow information from CN to RAN, update UE associated NGAP: *PDU Session Resource Modify Request Transfer* IE and *PDU Session Resource Setup Request Transfer* IE.**

**Introduce a non-UE associated NGAP Class1 Multicast Session Update procedure triggered by MB-SMF to support multicast session update in case the change of some of QoS parameters and/or service area.**

**Introduce non-UE associated NGAP Class1 Multicast Session Activation procedure and Multicast Session Deactivation procedure, FFS on whether a single procedure or separate procedures should be used for activation/update/deactivation.**

**Introduce one or two non-UE associated Class1 NGAP procedure(s), triggered by the gNB to implement Multicast Distribution Setup function, and Multicast Distribution Release function.**

**For location dependent Multicast MBS service, the MBS Distribution Setup/Release procedure is used to setup/release the NG-U tunnel for an area Session.**

**WA: introduce new MB-SMF containers in TS 38.413, subject to SA2/CT4. Applicable for both MC and BC.**

**Broadcast Session management**

**WA: Separate NGAP procedures are used to support Distribution Setup and Distribution Release.**

**WA: Different procedures are used for “Multicast Session Activation/Deactivation” and “Broadcast Session Start/Stop”.**

1. Annex C: RAN3#114bis\_e agreements on MBS Session Management

**Introduce new MB-SMF containers in TS 38.413. Applicable for both MC and BC.**

**Separate NGAP procedures are used to support Distribution Setup and Distribution Release.**

**Different procedures are used for “Multicast Session Activation/Deactivation” and “Broadcast Session Start/Stop”.**

**Broadcast Session Management:**

**For BC, establish the shared NG-U during Broadcast Session Setup Request/Response.**

**Include Session ID, Area Session ID (optional), Service Area information, MB-SMF container: MBS Session Information Request Transfer in the BROADCAST SESSION SETUP message and MBS Session Information Modify Request Transfer in the MODIFICATION REQUEST message.**

**-The MBS Session Information Request Transfer IE includes: shared NG-U TNL Information (optional) (carry IP multicast address), MBS QoS Flows To Be Setup List (QFI, QoS Flow level QoS parameters).**

**-The MBS Session Information Modify Request Transfer IE may include: shared NG-U TNL Information (optional), MBS QoS Flows To Be Setup or Modify List (QFI, QoS Flow level QoS parameters).**

**Include Session ID, Area Session ID (optional), and MB-SMF container: MBS Session Information Response Transfer, in the BROADCAST SESSION SETUP/ MODIFICATION RESPONSE messages.**

**-The MBS Session Information Response Transfer IE includes: DL UP Transport Layer Information (optional).**

**Multicast Session Management:**

**Define seperate procedures to support both Multicast Session Activation and Multicast Session Deactivation.**

**Define one procedure to support Multicast Session Update.**

**Perform admission control at session activation, if needed, and RAN node either accept the activation by sending session activation response message or reject the activation by sending activation failure message.**

**Include the MBS QoS Flow Level QoS Parameters and the MBS service area information(s) associated with the same MBS Session in the Multicast Session Update Request message.**

Editor Note: more agreements may be added based on further discussion in RAN3#114bis\_e.