**3GPP TSG-RAN WG3 Meeting #115-e *R3-222625***

**Online, 21st February 3rd March 2022**

**Title: [DRAFT]** LS on further outstanding issues in TS 23.247

**Response to:**

**Release:** Release 17

**Work Item:** 5MBS, NR\_MBS-Core

**Source:** Ericsson (will be RAN3)

**To:** SA2, RAN2

**Cc:**

**Contact Person:**

#### Name:

**Tel. Number:**

E-mail Address:

**Send any reply LS to: 3GPP Liaisons Coordinator,** **mailto:3GPPLiaison@etsi.org**

**Attachments:** -

# 1. Overall Description:

RAN3 would like to provide further feedback on issues contained in the latest version of TS 23.247 concerning NG-RAN.

## 1.1 first feedback

#### *7.2.1.3 Multicast session join and session establishment procedure*

*NOTE 4: A PDU Session UP activation is not triggered by the N2 SM information if it only includes information related to the multicast MBS session and associated QoS flows and is received by an MBS capable NG RAN node.*

*...*

Editor's Note: The implication of not triggering PDU Session UP activation in NG-RAN when SMF informs the NG-RAN of UE join requires RAN collaboration.

**RAN3 feedback**

There are two views in RAN3 on how to realise the above:

**view 1:** A PDU Session with deactivated UP corresponds to an NG-RAN UE context configuration w/o any corresponding PDU Session Resources, i.e. neither NG-RAN resources for the PDU Session tunnel on NG-U/N3 nor a DRB are configured. A PDU Session Resource configuration consisting of an NG-U termination *only* is neither possible as per TS 38.413 nor allowed as per TS 38.300. It is also to be noted that NR-RAN functions foresee the support of MRB-only configurations in Rel-17.

 With the above understanding, the implication of not triggering UP activation for the associated PDU Session at joining is that the associated PDU Session Resource Context is not established in the gNB and therefore at least the joining information needs to be provided to the UE Context in the gNB by means different than PDU Session Resource signalling on NG-C/N2. The impacted NGAP procedures would be: Initial Context Setup, UE Context Modification, Handover Preparation, Downlink NAS transport. Impact on XnAP procedures is given as well (Handover Preparation, Retrieve UE Context).

**view 2:** A PDU Session with deactivated UP corresponds to an NG-RAN UE context configuration w/ PDU Session Resources, i.e. with NG-U/N3 tunnel configured, but without a DRB. Implications on how to deal with contradicting statements as of TS 38.300 have not been discussed thoroughly in RAN3 yet.

## 1.2 second feedback

RAN3 would like to inform SA2 that RAN3 has agreed on two schemes to enable neighbouring gNBs allocating the same PDCP SN to MBS user data packets

**alternative 1** foresees theMB-UPF to associate identical sequence number information on NG-U/N3mb to gNBs allowing them to translate the NG-U/N3mb sequence numbers into PDCP Sequence Numbers which enables UEs at inter-gNB handover to detect duplicates and, if configured, request retransmissions.

**alternative 2** enables NG-RAN nodes sharing a common UP entity comprising (SDAP)/PDCP protocol entities and a NG-U/N3mb termination at NG-RAN.

 RAN3 denotes such entity a “shared NG-U termination”, referenced by a GTP-U tunnel address.

 Consequently, UEs receiving MBS user data issued through such a “shared NG-U termination” are able, at inter-gNB handover to detect duplicates and, if configured, request retransmissions - in the same way as in alternative 1.

**combination of alternatives 1&2:** RAN3 agreed that it is possible to combine both schemes and apply it for both, broadcast and multicast MBS sessions.

**Protocol support for alternative 1** is foreseen in TS 38.415, the NG-U User Plane protocol.

**Protocol support for alternative 2:**

RAN3 is discussing the possibility to support exchange availability of “shared NG-U terminations” via the NG-C/N2 interface in the following way:

- if the gNB is able to “offer” a “shared NG-U termination”, it provides a reference to the MB-SMF.

- in turn, the MB-SMF would provide information about “available NG-U termination”, as offered by gNBs, to other gNBs on a per MBS Session(/Area Session ID) basis.

Protocol impact is foreseen on NG-C/N2

- for broadcast: At *MBS Session Start for Broadcast* and *MBS Session Update for Broadcast*.

- for multicast: At *Establishment of shared delivery toward RAN node* and *Multicast session update*.

## 1.3 third feedback

RAN3 has reviewed all the Editor’s Notes in the latest version of TS 23.247 §7.2.3 concerning mobility between gNBs supporting NR MBS:

*7.2.3.2 Xn based handover from MBS supporting NG-RAN node*

*7.2.3.3 N2 based handover from MBS supporting NG-RAN node*

*Editor's note: Details on data forwarding, if applicable, needs to wait for RAN WGs.*

**RAN3 feedback**

RAN3 agreed to support synchronisation of PDCP SN allocation and NG-RAN in Rel-17 will support re-transmission of packets for NR MBS. Data forwarding between gNBs supporting NR MBS is supported and will be specified.

## 1.4 fourth feedback

RAN3 has discussed minimisation of data loss during handover with non-supporting NG-RAN nodes involved and came to the following conclusions:

**handover from supporting to non-supporting NG-RAN node:**

 data forwarding is supported; the point in time when the supporting gNB stops data forwarding by inserting end-marker packets is a matter of implementation.

**handover from non-supporting to supporting NG-RAN node, reconfiguring a UE from individual to shared delivery:**

 enabling detection and removal of duplicates is a matter of implementation.

# 2. Actions:

**To SA2 group.**

**ACTION: RAN3 kindly asks SA2 the following:**

**on first feedback:** please answer which view is appropriate and, if view 1 is appropriate, whether indicated protocol changes can be supported by appropriate 5GC functions.

**on second feedback:** please answer whether SA2 can support NG-C/N2 protocol support for alternative 2.

**on third feedback:** please note RAN3’s decision.

**on fourth feedback:** please note RAN3’s decision

**To RAN2 group.**

**ACTION: RAN3 ask RAN2 to take the above information into count, where applicable for RAN2’s work on NR MBS**

**3. Date of Next TSG-RAN WG3 Meetings:**

TSG-RAN WG3 Meeting#116-e 16th - 27th May 2022

TSG-RAN WG3 Meeting#117 22nd - 26th August 2022