**SA WG2 Meeting #156E (e-meeting) S2-230xxxx**

**April 17 – 21, 2023 *revision of S2-230xxxx***

**Source: Nokia, Nokia Shanghai-Bell**

**Title:** **Avoiding PDU session modifications to transfer MBS assistance information during Xn handover**

**Document for: Approval**

**Agenda Item: 9.10.2**

**Work Item / Release: 5MBS\_Ph2 / Rel-18**

*Abstract:.* *This contribution discusses how to avoid PDU session modifications to transfer MBS session information and assistance information during Xn handover. A related CR is in S2-230xxxx*

# 1. Introduction

This contribution discusses how to avoid PDU session modifications to transfer MBS session information and assistance information during Xn handover. A related CR is in S2-230xxxx

# 2. Discussion

TS 23.247 contains the following:

*7.2.3.4 Xn/N2 based handover from non-MBS supporting NG-RAN node*

*When the UE has joined the multicast MBS session and the source NG-RAN node does not support MBS, the 5GC Individual MBS traffic delivery method is used for the multicast MBS session data delivery. When the Xn/N2 based handover procedure is triggered, the UE is handed over to the target NG-RAN node per existing Xn /N2 based handover procedure defined in TS 23.502 [6].*

*The following applies for an Xn based handover from an NG-RAN node not supporting 5G MBS:*

*- The source NG-RAN node requests the associated QoS Flow(s) in the associated PDU session to be handed over to the target NG-RAN node.*

*- In the Path Switch Request message, the target NG-RAN node, if MBS-capable, indicates it supports MBS to the SMF in the N2 SM information.*

*-* ***After successful handover, if the target NG-RAN node supports MBS, the SMF triggers modification of the associated PDU Session at the target NG-RAN node by including the multicast MBS session related information in N2 SM*** *Information as described in step 7 of clause 7.2.1.3, which may trigger the target NG-RAN node to initiate establishment of shared delivery as described in clause 7.2.1.4.*

*7.2.3.8 Mobility procedures to enable delivery of multicast MBS session data to UEs in RRC\_INACTIVE state*

*7.2.3.8.1 General*

*The procedures in clause 7.2.3.2, 7.2.3.3, 7.2.3.4, 7.2.3.6 and 7.2.3.7 apply with the following additions:*

*- If MBS assistance information is available at the SMF, depending on configuration the SMF may always provide the MBS session information comprising the MBS assistance information for the MBS session related to the MBS session that UE joined towards the target RAN node. This includes the following procedures:*

*- For the Xn based handover procedure,* ***if the target RAN node supports MBS, after the successful handover the SMF triggers the modification of the associated PDU session to provide the MBS assistance information for the MBS session within the MBS session information to target NG-RAN.***

*- During the N2 based handover preparation phase, the SMF provides the MBS assistance information in the MBS session information to target NG-RAN.*

*- During the connection resume procedure,* ***if the target RAN node supports MBS, after acknowledging the path switch request, the SMF triggers the modification of the associated PDU session to provide the MBS assistance information for the MBS session within the MBS session information to target NG-RAN****.*

*- The MBS session information transferred from source NG-RAN towards target NG-RAN also include MBS assistance information for the MBS session if such information is available at the source RAN node.*

*Editor's note: It is up to RAN WG to confirm that the MBS session information transferred from source NG-RAN towards target NG-RAN includes MBS assistance information.*

*NOTE 1:* ***In deployments where not all the MBS supporting NG RAN nodes support delivery of multicast MBS session data to UEs in RRC\_INACTIVE state, a source NG-RAN node not supporting delivery of multicast MBS session data to UEs in RRC\_INACTIVE state will not provide MBS assistance information for the MBS session to the target NG-RAN node.***

*7.2.4.2 Support of location dependent multicast service*

*7.2.4.2.3 Handover procedure*

*…*

*- If the UE has moved to another MBS service area of the MBS session:*

*- If the target NG-RAN node support MBS and RAN resource has not been allocated, the SMF provides the MBS session information related to the new Area session ID to NG-RAN.* ***For Xn handover, the SMF updates the PDU session with the N2 SM information using the Path Switch Request Ack message****. For N2 handover, the SMF updates the PDU session after the completion of the handover procedure. Per the received the MBS session information, the 5GC shared delivery is established.*

**Observation 1: There is a contradiction between normal handover procedures and location-dependent handover procedures related to how the SMF sends MBS session information to a target RAN node during Xn handover: In the path switch ACK message or via a subsequent PDU session modification that should be resolved from Rel-17 onwards.**

Using the path switch ACK avoids extra signalling messages but does not offer the RAN node the possibility to reject the modification. However, there is no reason for a RAN node to reject a PDU session modification only adding MBS session information (Note that associated QoS flows will be provided already before from the source RAN node even if it does not support MBS and applies individual delivery.

**Observation 2: PDU session modifications after Xn handover can become much more frequent in Rel-18.**

In Rel-17, such PDU session modifications were only required if the source NG RAN node did not support MBS (but the target NG RAN node does). In Rel-18, such PDU session modifications are required irrespective of whether the source NG RAN node supports MBS (because the source NG RAN node might not support and provide the Rel-18 MBS assistance towards a target RAN node supporting that).

**Proposal: Allow that the SMF provisions MBS session information (including MBS assistance information in Rel-18) within the XN handover path switch ACK message (from Rel-17 or REl-18 onwards)**

Nokia also intends to contribute in RAN3 accordingly.