**3GPP TSG-RAN WG2 Meeting #112-e R2-2011226**

**Online meeting, 2nd - 13th November, 2020**

**Title: [DRAFT]** **Reply** LS on questions to RAN WGs on dual Radio UE (2Rx/2Tx or 2Rx/1Tx) support for simultaneous communication with both SNPN and PLMN

**Response to:** S2-2007827

**Release:** Release 17

**Work Item:** FS\_eNPN

**Source:** Futurewei [TSG RAN WG2]

**To:** TSG SA2

**Cc:** TSG RAN WG4

**Contact Person:**

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**Attachments:** n/a

**1. Overall Description:**

RAN2 would like to thank SA2 for the LS in S2-2007827 (R2-2010691). RAN2 has discussed support for simultaneous communication with both SNPN and PLMN for the following dual Radio UE architectures:

1. Dual radio UE using independent Rx/Tx per network (SNPN and PLMN)
2. Dual radio UE using independent Rx per network (SNPN and PLMN) and a single Tx for one of the two networks only, e.g. the SNPN (whereby UL user-plane and NAS traffic for the other network is tunnelled via the first network using existing IP-based OTT mechanisms)

RAN2 has the following responses on SA2’s questions:

Q1: is a) technically feasible without any new Access-Stratum mechanism and standardization?

A1: For scenario a) dual radio UE using independent Rx/Tx per network, RAN2 concluded that it is technically feasible for the UE to simultaneous communicate with both SNPN and PLMN (assuming a single RAT) without new AS mechanisms.

This assumes that the UE’s RF frontend is able to operate independently on the carrier frequencies/bands in use in each network. In other words, this assumes that independent operation in both networks does not result in significant interference between the two radios. Handling of such interference can be left to UE implementation without requiring standard impact, or *minimum performance requirements may need to be standardized by RAN4.*

Q2: is b) technically feasible taking into account the uplink Access Stratum activity in each network?

A2: For scenario b) dual radio UE using independent Rx per network (SNPN and PLMN) and a single Tx for one of the two networks only, RAN2 reiterated that if the UE’s RRC state is RRC\_CONNECTED in the first network (e.g. PLMN) then its RRC state cannot also be RRC\_CONNECTED in the second network (e.g. SNPN), i.e. the UE can only be in RRC\_IDLE in the second network, therefore L1/L2 control signals or messages (comprising AS feedback) cannot be sent. In other words, the UE can only be in RRC\_CONNECTED in one of the networks and thus, it can only send AS feedback to the network in which it is RRC\_CONNECTED.

While being in RRC\_IDLE in the second network, the UE can however receive broadcast traffic via the air interface of this second network

From RAN2 perspective, tunnelling of any data traffic (e.g. user plane and NAS) of the second network via the first network is feasible while the UE is in RRC\_IDLE in the second network. But it is not feasible to tunnel L1/L2 control signals or messages (comprising AS feedback), for UEs in RRC\_IDLE.

Q3: whether in case of b) is it feasible to achieve a very low PER for low latency multicast traffic without sending access stratum feedback to the network (e.g. the SNPN RAN)?

A3: RAN working groups are currently considering two delivery modes for MBS: One is used by UEs in RRC\_CONNECTED to support high QoS services, and the other to support low QoS services which can also be received by UEs in RRC\_INACTIVE/RRC\_IDLE.

To receive multicast traffic RAN2 is so far assuming that the UE should use the high QoS mode (high reliability, low latency), and AS feedback is normally required to support reliable reception of multicast traffic, i.e. the UE needs to be in RRC\_CONNECTED for the high QoS mode.

To receive broadcast traffic, RAN2 is so far assuming that the UE can use the low QoS mode, and AS feedback is not necessary for the low QoS mode, and therefore, the broadcast traffic can also be received by UE in RRC\_IDLE/RRC\_INACTIVE.

Therefore, if the use case being considered by SA2 (**very low PER for** **low latency multicast traffic)** requires the use of the high QoS MBS delivery mode, then RAN2 assumes this would require sending access stratum feedback to the network.

**2. Actions:**

**ACTION:** RAN2 respectfully asks SA2 to take into account RAN2 feedback to the questions raised in LS S2-2007827.

**3. Date of Next TSG-RAN WG2 Meetings:**

3GPP RAN2#113-e 25th of Jan – 5th of Feb 2021 Electronic Meeting

3GPP RAN2#113-bis-e 12th of April – 20th of April 2021 Electronic Meeting