3GPP TSG-RAN WG2 #110-e draft-R2-2006029

Electronic meeting, 1st - 12th June, 2020

**Title: [DRAFT]** Reply LS on Rel-16 UE feature lists

**Response to:** LS on Rel-16 RAN1 UE feature lists for NR (R1-2003072)

**Release:** Rel-16

**Work Item:** NR\_UE\_pow\_sav, NR\_IAB-Core, NR\_eMIMO-Core, NR\_IIOT-Core, NR\_2step\_RACH-Core, 5G\_V2X\_NRSL-Core, NR\_Mob\_enh-Core, NR\_pos-Core, NR\_unlic-Core, LTE\_NR\_DC\_CA\_enh-Core, NR\_SON\_MDT-Core, NR\_CLI\_RIM, NG\_RAN\_PRN-Core, TEI16, NR\_L1enh\_URLLC-Core

**Source:** Intel Corporation/NTT DoCoMo [To be RAN WG2]

**To:** RAN WG1, RAN WG4

**Cc:**

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**Attachments:** -

1. **Overall Description:**

RAN2 would like to thank RAN1 and RAN4 for their LSes on UE feature lists for Rel-16. Based on discussions during RAN2#110-e, RAN2 would like to inform RAN1 and RAN4 on the below for the various questions asked.

1. **eMIMO WI one-row vs two-row:**

In RAN2 view, there is no significant difference in signalling maximum number of SRS resources and any TMPI(s) supported by the UE using one row or two rows.

**2.1 Interpretation of the support of TMPI(s) for lower configurations in mode-2 operation**

RAN2 wonders whether the UL full power mode-2 supporting TPMIs for the lower configuration of coherency/port config can be deduced from the reported set of TPMIs, or does the UE need to explicitly report supported TPMIs for each coherency/port config the UE can support as part of it’s capability?

1. **MsgB size in relation to Msg2/Msg4:**

MSGB can contain one or more successRAR, one or more fallbackRAR, and can contain one RRC payload. MSGB size without RRC payload is generally comparable in size (i.e. NOT significantly larger compared) to that of Rel-15 Msg2 – the slight difference coming from successRAR being slightly larger than fallbackRAR (4 bytes larger) for the multiplexed case. MSG-B size can be comparable as MSG4 when the RRC payload is included. Similar to Msg2, RAN2 also assumes MsgB maximum size can be limited by the physical coverage of the cell

Further it is the view of RAN2 that the network may not know the UE ID (e.g. in the fallback case) and the network may not yet have the UE capability (in initial access cases), In these scenarios, the NW cannot ensure that PDSCHs scheduled for the UE would not exceed the UE capability (i.e. the signalled capability is not useful). One company in RAN2 feels that if a default value for number of PDSCH(s) a Rel-16 UE should support, this issue can be avoided, while another company prefers that RAN1 specifies a restriction on the maximum size of MsgB in order to not add additional UE requirements.

1. **NR-DC cell grouping capability4:**

RAN2 has agreed to design the NR-DC cell grouping capability for the UE using the LTE style of capability signaling. RAN2 intends to restrict the NR-DC cell grouping signaling to NR DC combinations with up to 5 bands and for NR DC combinations with more than 5 bands in the combination, the UE cannot signal NR-DC cell grouping. The motivation for the above is that in LTE, there were no DC combinations defined with more than 5 bands, and RAN2 views the same with NR. RAN2 may consider simplify the cell grouping signaling for the case where all FR1 bands are in MCG and all FR2 bands are in SCG, even for inter-band DC with more than two bands.

**4.1 Further restrictions that are applicable to NR -DC combinations**

RAN2 would like to request RAN1 and RAN4 if they see any additional restrictions in the definition of NR-DC combinations that can help reduce the NR-DC cell grouping capability reporting at the UE.

1. **V2X:**

To capture properly PC5 bands “without network control/configuration” in the UE capability in a forward compatible manner, RAN2 views that this is feasible from signalling point of view because PC5 frequency bands/band combination will be defined in UE capability signalling. However, whether one can differentiate with and without network control/configuration by PC5 band should be dependent on how RAN4 specifies the PC5 bands, related PC5 BCs, e.g., whether PC5 bands / BCs are separately defined for the operation with and without network control/configuration.

In NR Uu case, it has been RAN2 assumption that RAN4 band support is release independent meaning that if/when a certain band is introduced in Rel-16, the Rel-15 UE can also support it as long as this UE indicates the support of this band in UE capability. If new frequency bands continue to be introduced by RAN4 in a release independent manner, the current Sidelink frequency bands support signalling should be able to handle this. Similarly, RAN2 views that FG capability based on the PC5 bands can also be introduced in a release independent manner. Also from future-proofing perspective, RAN2 views that the PC5 bands introduced by RAN4 would be uniquely identifiable from the Uu bands, based on the band number of the new PC5 bands, and also wonders whether/how this can be maintained if the PC5 bands are not defined by RAN4 (for example, some ITS or DSRC bands).

1. **Misc items related to the UE feature lists:**

**6.1 Dormancy support interpretation in RAN1 UE feature list:**

Regarding FG 18-4/4a/4b in RAN1 UE feature lists, it is RAN2’s view that if RAN1 agrees to allow the UE to report the support of dormancy per band combination, if the UE reports that it supports dormancy for a band combination, the UE should support the dormancy for all the fallback band combinations of this reported band combination. RAN2 would like to RAN1 to notify if this is not RAN1’s intention.

**6.2 FG interpretation in RAN1 and RAN4 UE feature lists:**

It is the view of RAN2 (from RP-200502 [1]) that a UE supporting a feature group should support all the components of the feature group. Based on the UE feature list content, this appears to be not applicable to all the FGs from the lists, and so request RAN1 and RAN4 to clearly indicate the relation among components within a FG when it is not according to the RAN guidance. It should be noted that as in LTE since Rel-11, NR capability signaling has been defined per NR feature. In other words, there is no “feature group” in the existing NR capability signaling. Unless there is a strong rationale for groping the features, it is desirable that the term of feature group and feature grouping should be not used any more in the UE feature list.

1. **UE capability signalling timeline impact based on the availability of RAN1 and RAN4 UE feature lists:**

RAN2 would also like to provide the timeline of designing the signalling based of the availability of RAN1 and RAN4 UE feature lists as below:

* RAN2 plan to start working on the capability signalling design aspects under the assumption that the UE feature lists from RAN1 and RAN4 are available to RAN2 by the end of RAN1 and RAN4 WG meetings (viz., end of June 5th, 2020).
* Any content that is FFS will NOT be considered/discussed as part of the UE capability signalling for the June specification version but could be considered in the next quarter.
* Further agreements, if any, from email discussions after the RAN1 and RAN4 meetings cannot be part of June specification version but could be considered in the next quarter.

1. **Actions:**

**To RAN1:** RAN2 respectfully asks RAN1 to take the above into account and to provide RAN1 views on the questions in 2.1, 4.1, 6.1 and 6.2. RAN2 also respectfully requests that RAN1 provide the UE feature list by end of RAN1 meeting (end of June 5th), while considering the content from item 7 above.

**To RAN4:** RAN2 respectfully asks RAN4 to take the above into account and to provide RAN4 views on the questions in 4.1, the views on V2X in 5, and FG interpretation in 6.2. RAN2 also respectfully requests that RAN4 provide the UE feature list by end of RAN4 meeting (end of June 5th), while considering the content from item 7 above.

To RAN1/RAN4: RAN2 respectfully asks RAN1 and RAN4 not to use the term of feature group and feature grouping any more in the UE feature list.

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

TSG-RAN WG2 Meeting #111-bis 2020-10-12 to 202010-16 India

TSG-RAN WG2 Meeting #112 2020-11-16 to 2019-11-20 US

**4. References:**

[1] RP-200502 Informational summary on email discussion Rel16\_UE\_capabilities