**3GPP TSG-RAN WG2 Meeting #115 electronic R2-210xxxx**

**Online, August 16 – August 27, 2021**

**Title:** LS on UE Power Saving

**Response to:**

**Release:** Rel-17

**Work Item:** NR\_UE\_pow\_sav\_enh-Core

**Source:** RAN2, MediaTek Inc.

**To:** SA2, CT1, RAN3, RAN1

**Cc:**

**Contact Person:**

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**Attachments:** None

**1. Overall Description:**

RAN2 discussed **UE paging subgrouping** as part of the Rel-17 work on UE power saving enhancement (see RP-200938), in order to reduce power consumption in the UE due to false paging alarms (i.e. when the UE receives a paging message on PDSCH on its paging occasion, which is not intended for that UE). This is done by further dividing the UEs within a paging occasion into multiple subgroups. A UE will decode the Paging message in its Paging occasion only if it is received an indication that its subgroup is being paged. Two subgrouping approaches have been agreed, namely CN-assigned subgrouping and UEID-based subgrouping. No CN impact has been identified for UE-ID based subgrouping. The following provides the detailed agreements below for the 2 approaches:

CN-assigned subgrouping

* CN assigns subgroup ID.
* When AMF has assigned a UE with a Paging subgroup, some NAS signalling should be supported between AMF and UE to convey the related information to the UE. Exact information is FFS. The design and procedure are up to SA2/CT1.
* When AMF has assigned a UE with a Paging subgroup, some signalling should be supported between AMF and gNB(s) to inform gNB(s) about the related subgroup information for paging a UE in RRC\_IDLE/RRC\_INACTIVE. Exact information is FFS. The message(s) and associated design are up to RAN3.
* It is FFS when a UE in RRC\_INACTIVE has been assigned by CN a Paging subgroup, whether some signalling should be introduced between gNBs to inform each other about the UE’s subgroup for RAN paging.
* If RAN2 agrees to support UE assistance information to CN in support of paging subgroup assignment, RAN2 will focus on the paging probability and power profile attributes.

UEID-based subgrouping

* UEID-based subgroup method requires, in addition to the already available information for legacy UEID-based grouping in PO, the total number of supported UEID-based subgroups by the network.
* At least for UEID-based subgroup method the total number, Nsg, of supported subgroups by the network is decided by RAN and broadcasted in System Information.
* At least for UEID-based subgroup method the total number, Nsg, of supported subgroups is controlled on a cell basis and can be different in different cells.

Coexistence of CN-assigned and UEID-based subgrouping

* R2 assumes that all the cells within the registration area supports the same number of CN assigned subgroups, i.e. no remapping of CN assigned group ID to RAN subgroup ID (will revisit only if serious issues are found).
* For the purpose of continued discussions, R2 assumes that UE has separate UE capabilities for CN assigned and UEID based subgrouping, the actual decision to be taken later.
* RAN capability is known based on broadcast information. FFS with explicit indication or implicitly based configuration.

RAN2 also discussed **TRS/CSI-RS for RRC Idle and Inactive**, and agreed to the following:

* The TRS/CSI-RS configuration is provided in a new SIB.
* RAN2 assumes that TRS/CSI-RS configurations are broadcasted. Potential addition of dedicated signalling can be discussed in a later meeting based on company contributions.
* The legacy SI update procedure is used for changing TRS/CSI-RS configurations.
* Postpone the topic about TRS/CSI-RS availability until a later meeting when RAN1 also has progressed.
* On demand SI should be possible for the SIB with TRS/CSI-RS information.
* Postpone the discussion on segmentation of the new SIB until RAN1 has sent the list of the parameters and a potential structure.
* Postpone the discussion on splitting the TRS/CSI-RS information to a common and RS-specific part until RAN1 has sent the list of the parameters and a potential structure.

**2. Actions:**

**To SA2, and CT1:**

RAN2 respectfully asks SA2, and CT1 to take the above information into account for their future work, and provide further information on the following issue once concluded:

* NAS signalling between AMF and UE to convey the related information to the UE.

**To RAN3:**

RAN2 respectfully asks RAN3 to take the above information into account for their future work, and provide further information on the following issues once concluded:

* Signalling between AMF and gNB(s) to inform gNB(s) about the related subgroup information for paging a UE in RRC\_IDLE/RRC\_INACTIVE.
* Signalling between gNBs to inform each other about the UE’s subgroup information for RAN paging.

**To RAN1:**

RAN2 respectfully asks RAN1 to take the above information into account for their future work, and provide further information on the following issues once concluded:

* TRS/CSI-RS availability.
* List of the parameters and a potential structure for TRS/CSI-RS information.

**3. Date of Next RAN2 Meetings:**

TSG RAN WG2 Meeting #116-e 1 November – 12 November, 2021 e-Meeting

TSG RAN WG2 Meeting #117 21 February – 25 February, 2022 Athens, GR