**3GPP TSG-RAN WG2 Meeting #116bis Electronic DRAFT R2-220xxxx**

**Online, 17 – 25 January 2022**

**Title:** LS on PDC for Time Synchronization

**Response to:**

**Release:** Release 17

**Work Item:** NR\_IIOT\_URLLC\_enh-Core

**Source:** RAN2

**To:** RAN3

**Cc:** RAN1, RAN4

**Contact Person:**

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**Attachments:** -

**1. Overall Description:**

In RAN2#116bis e-meeting, based on the latest RAN1 progress as indicated in [R2-2200080], RAN2 has discussed the open issues for Time Synchronization and focus on the specification impacts of RTT-based PDC and legacy TA-based PDC procedures. The agreements are achieved as below:

1. Both RTT-based PDC and legacy TA-based PDC are supported.
2. Both RTT-based UE side PDC and RTT-based gNB side PDC are supported. RTT-based gNB side PDC has to be a simple solution and converge by February meeting.
3. A single pair of TRS/PRS and SRS is configured via RRC signaling for RTT-based PDC.
4. For RTT-based UE side PDC, gNB Rx-Tx time difference, e.g., gNBRx-Tx, shall be provided to UE via DLInformationTransfer signaling.
5. No need to introduce additional activation for RTT measurement in UE side.
6. For RTT-based gNB side PDC, RRC measurement framework can be reused as baseline to provide UE Rx-Tx time difference report.
7. For RTT-based gNB side PDC, besides UE Rx-Tx time difference, no additional information needs to be reported to NW.
8. The signaling flow(s) of RTT-based PDC can be captured in stage-2 specification (taking the examples in [R2-2200991] or [R2-2201016] as baseline). The details can be further fine-tuned based on RAN2 agreements during stage-2 running CR review.
9. FFS an explicit indication to only activate UE side TA-based PDC is introduced in SIB or in unicast signalling and what is indicated
10. FFS For TA-based PDC, it’s no need to specify PD calculation related contents in RAN2.
11. Network configuration should guarantee that RTT-based PDC and TA-based PDC are not activated simultaneously for a UE.
12. RAN2 confirms to introduce separate R17 UE capabilities for RTT-based PDC and legacy TA-based PDC, as defined by RAN1 feature list.
13. RAN2 confirm the agreement in last meeting that reference time provided in dedicated signaling takes priority. FFS UE behavior when it receives reference time info via dedicated signaling.
14. It’s no need to specify solution for the issue of mismatch between propagation delay value and reference time information.

Moreover, in recent RAN2 e-meetings, some agreements related to TA-based PDC have been achieved as below:

RAN2#115 e-meeting:

1. RAN2 assumes that gNB can perform pre-compensation. RAN2 agrees to introduce signalling to enable/disable UE-side PDC.
2. The gNB can enable/disable UE-side PDC via unicast-RRC signalling for Rel-17.

RAN2#116 e-meeting:

1. The gNB can enable/disable UE-side PDC via unicast and broadcast RRC signalling.

RAN2 understands that the above agreements marked with highlight yellow may have impacts on RAN3 specifications, e.g., F1 application protocol. Therefore RAN2 respectfully ask RAN3 to take the above information into account and to see whether changes to specification are needed.

**2. Actions:**

**To 3GPP RAN3**

**ACTION:** RAN2 respectfully asks RAN3 to take the above information into account in their future work.

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

3GPP RAN2#117-e from 2022-02-21 to 2022-03-03 Electronic Meeting