3GPP TSG-RAN WG2 Meeting #117 electronic [R2-2203514](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203514.zip)

Online, February 21 - March 3, 2022

Source: Session Chair (InterDigital)

Title: Report for Rel-17 Small data, URLLC/IIoT and RACH partitioning

**Email discussions:**

* [AT117-e][500] Organizational Diana – URLLC/IIoT, Small data]

Scope:

* + - Share plans for the meetings and list of ongoing email discussions for the sessions related to URLLC/IIoT, Small data and NR-U, 2-step RACH, and power saving
    - Share meetings notes and agreements for review and endorsement
* [AT117-e][501][Sdata] CP additional open issues (Samsung)

Remaining CP open issues

Deadline: Proposals by rapporteur by Friday (intermediary deadlines for comments to be set by rapporteur)

* [AT117-e][502][Sdata] UP additional open issues (InterDigital)

Remaining UP open issues

Deadline: Proposals by rapporteur by Friday (intermediary deadlines for comments to be set by rapporteur)

* [AT117-e][503][IIoT] Tsynch additional open issues (Qualcomm)

Remaining Tsynch open issues

Deadline: Proposals by rapporteur by Friday (intermediary deadlines for comments to be set by rapporteur)

* [AT117-e][504][IIoT] QoS additional open issues (Nokia)

Remaining Tsynch open issues

Deadline: Proposals by rapporteur by Friday (intermediary deadlines for comments to be set by rapporteur)

* [AT117-e][505][RA Part] CP additional open issues (Huawei)

Remaining CP open issues

Deadline: Proposals by rapporteur by Friday (intermediary deadlines for comments to be set by rapporteur)

* [AT117-e][506][RA Part] UP additional open issues (Intel)

Remaining UP open issues

Deadline: Proposals by rapporteur by Friday (intermediary deadlines for comments to be set by rapporteur)

* [AT117-e][507][Sdata] UE Capabilities (Intel)

UE capabilities CRs (38.306/308.331)

Deadline: final approval by March 2nd

* [AT117-e][508][IIoT] UE Capabilities (Intel)

UE capabilities CR (38.306/308.331)

Deadline: final approval by March 2nd

* [AT117-e][509][Sdata] CR 38.300 (Nokia)

Review and agree to final CR 38.300

Deadline:

* [AT117-e][510][Sdata] CR 38.331 (ZTE)

Review and agree to final CR 38.331

Deadline:

* [AT117-e][511][Sdata] CR 38.321 (Huawei)

Review and agree to final CR 38.321

Deadline:

* [AT117-e][512][IIoT] CR 38.300 (Nokia)

Review and agree to final CR 38.300

Deadline:

* [AT117-e][513][IIoT] CR 38.331 (Ericsson)

Review and agree to final CR 38.331

Deadline:

* [AT117-e][514][IIoT] CR 38.321 (Samsung)

Review and agree to final CR 38.321

Deadline:

* [AT117-e][515][RA Part] CR 38.331 (Ericsson)

Review and agree to final CR 38.331

Deadline:

* [AT117-e][516][RA Part] CR 38.321 (ZTE)

Review and agree to final CR 38.321

Deadline:

* [AT117-e][511][Sdata

## 8.5 NR IIoT URLLC

(NR\_IIOT\_URLLC\_enh-Core; leading WG: RAN2; REL-17; WID: RP-210854)

Time budget: 1 TU

Tdoc Limitation: 2 tdocs

### 8.5.1 Organizational

Including open issues for control plane and user plane [POST116bis-e][512][IIoT] UP open issues (Samsung) and [POST116bis-e][513][IIoT] CP open issues (Ericsson)

NOTE: NO contributions on these critical open issues are expected

[R2-2202464](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202464.zip) Draft 38.306 CR for Rel-17 NR IIoT URLLC UE capabilities Intel Corporation draftCR Rel-17 38.306 16.7.0 B NR\_IIOT\_URLLC\_enh-Core

=> The CR will be review over email discussion after any necessary updates

[R2-2202465](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202465.zip) Draft 38.331 CR for Rel-17 NR IIoT URLLC UE capabilities Intel Corporation draftCR Rel-17 38.331 16.7.0 B NR\_IIOT\_URLLC\_enh-Core

=> The CR will be review over email discussion after any necessary updates

[R2-2202522](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202522.zip) RAN1 feature impact on intra-UE prioritization in MAC Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202682](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202682.zip) Introduction of enhanced IIoT&URLLC support for NR Samsung CR Rel-17 38.321 16.7.0 1200 - B NR\_IIOT\_URLLC\_enh-Core

=> The CR endorsed as baseline for further discussion over email

[R2-2203196](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203196.zip) Introduction of Rel-17 IIoT/URLLC to TS 38.300 Nokia, Nokia Shanghai Bell CR Rel-17 38.300 16.8.0 0416 - B NR\_IIOT\_URLLC\_enh

=> The CR endorsed as baseline for further discussion over email

[R2-2202325](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202325.zip) Introduction of enhanced IIoT&URLLC support for NR Ericsson CR Rel-17 38.331 16.7.0 2887 - B NR\_IIOT\_URLLC\_enh

=> The CR endorsed as baseline for further discussion over email

[R2-2203291](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203291.zip) Propagation Delay Compensation for TSN Qualcomm Incorporated discussion Rel-17 Withdrawn

[R2-2202686](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202686.zip) Report of [POST116bis-e][512][IIoT] UP open issue Samsung discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core Late

*Proposal 1 Upon enhanced type-3 HARQ-ACK codebook request, UE starts drx-HARQ-RTT-TimerDL for the HARQ process(es) whose HARQ-ACK information is reported (i.e. HARQ processes configured by pdsch-HARQ-ACK-enhType3perCC or pdsch-HARQ-ACK-enhType3perHARQ).*

- Ralf is concerned that there is processing complexity with this and thinks we should have as separate timer for this. If not possible we should try to find way to limit the HARQ processes. Samsung doesn’t think starting time increases UE complexity. We don’t want to support all the cases from RAN1 so this is the simplest way to address it.

*Proposal 2. FFS whether it is applicable for Rel-16: Upon Rel-16 type-3 HARQ-ACK codebook request, UE starts drx-HARQ-RTT-TimerDL for all HARQ processes.*

- LG asks if we have to restart the HARQ RTT timer and Samsung confirms.

=> Noted

**Agreements**

1. Upon enhanced type-3 HARQ-ACK codebook request, UE starts drx-HARQ-RTT-TimerDL for the HARQ process(es) whose HARQ-ACK information is reported (i.e. HARQ processes configured by pdsch-HARQ-ACK-enhType3perCC or pdsch-HARQ-ACK-enhType3perHARQ). Same principle applies to Rel-16, will be fixed only on Rel-17 specs. FFS on details
2. Upon One-shot HARQ-ACK retransmission request, UE starts drx-HARQ-RTT-TimerDL for the HARQ process(es) whose ACK/NACK status is reported.
3. RAN2 to confirm that the current MAC specification already captures the behaviour upon SPS HARQ-ACK deferral. FFS whether to capture a NOTE for clarification, similar to non-numerical k1.
4. RAN2 to confirm that the current MAC specification already captures the behaviour upon PUCCH cell switching (no specification change).
5. MAC specification captures simultaneous PUCCH-PUSCH transmission. TP in [R2-22021368](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-22021368.zip) with LG’s suggestion is a baseline
6. LCH-based Prioritization does not consider whether the resource is a COT-initiated UL transmission
7. Capture “Survival Time State” in stage 2 only

[R2-2203302](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203302.zip) Summary of [POST116bis-e][513][IIoT] CP open issues (Ericsson) Ericsson discussion NR\_IIOT\_URLLC\_enh Late

*Proposal 1 UE Rx-Tx time difference measurement report is triggered by an explicit request (11/16). RAN2 to further discuss whether it is one shot, periodic or both.*

*a. Explicit request (11/16): one-shot, 7/16*

*b. Explicit request (11/16): periodic, 4/16*

*-* Ericsson, ZTE, Huawei and Nokia are fine with both. Nokia and Huawei think it should definitely have both. We can cover the first with the setting of periodic timer.

*-* Mediatek would like to specify only what is necessary. PDC is only needed when the clock drifts and we need to update, so one shot is the only thing necessary. CATT, Intel, LG, Apple, Lenovo, Samsung shares same view. There is no need for periodic. Ericsson explains that in Rel-16 would broadcast the time and it can periodically refresh time so it make sense to have periodic. LG and apple can accept the periodic but it should be set to a large value. Oppo supports both but would like to prioritize periodic. Qualcomm things that periodic is simplest.

*-* LG asks how periodic reporting would work (would it be always done when configured, how is it stopped and started)

*Proposal 2 As soon as a UE receives its reference time information via dedicated signaling, it ignores all further reference time information received over SIB9. gNB can only rely on dedicated signalling afterwards (14/15). FFS, when the UE fallback to receiving SIB9 with the existing procedure (e.g., handover, RLF, etc.)*

- Vivo thinks we need a way to fallback to SIB9. Ericsson agrees but not details are given. Huawei think that we should really support fallback and it should be an explicit configuration by gNB.

*Proposal 6 Provision of measurement configuration indicates that UE measures the Rx-Tx time difference. Provision of gNB Rx-Tx time difference to UE implicitly activates PDC calculation at the UE side.*

- Qualcomm is asking why we need another mechanism on top of proposal 3. Ericsson explains that this for RTT based.

*Proposal 8 UE supporting of FG 25-19/25-19a also supports both UE-side and gNB-side PDC (if agreed). (8/15)*

=> Discuss it in email discussion 508

=> Noted

**Agreements:**

1 UE Rx-Tx time difference measurement report is triggered by an explicit request. FFS if both one shot and periodic will be supported. Email discussion on details of periodic configuration

2 As soon as a UE receives its reference time information via dedicated signaling, it ignores all further reference time information received over SIB9. gNB can only rely on dedicated signalling afterwards. FFS, when the UE fallback to receiving SIB9 with the existing procedure (e.g., handover, RLF, etc.) – clarify details and how best to capture in RRC

3 RAN2 to introduce separate signalling procedures for UE-side PDC, one for TA, and another one for RTT. RRC field description restricts the network from configuring both

4 UE-side TA PDC is activated/de-activated by a Boolean. No need to specify PD calculation in RAN2 spec.

5 UE-side TA PDC activation/de-activation is supported in both RRC unicast and SIB9

6 No RAN2 spec impact due to RAN1 conclusion that “for RTT-based PDC, the transmission of DL TRS/PRS, UL SRS and reference time information are associated with a same TRP.”

*7 RAN2 does not introduce optional capability for dedicated signalling takes priority (13/14).*

*8 The optional UE capability for survival time is per-UE*

9 A UE supporting survival time feature shall also support at least CA duplication for DRB (pdcp-DuplicationMCG-orSCG-DRB) or DC duplication for DRB (pdcp-DuplicationSplitDRB). (10/17)

10 A UE supporting survival time feature shall also support at least configured grant type 1 (configuredUL-GrantType1-v1650) or configured grant type 2 (configuredUL-GrantType2-v1650).

### 8.5.2 Enhancements for support of time synchronization

RAN1 progress if any should be taken into account.

Contributions should only be focused on important issues not included in open issues email discussion.

[R2-2203733](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203733.zip)

[R2-2202182](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202182.zip) RE: LS on Time Synchronization IEEE 1588 WG LS in To:RAN, SA Cc:RAN2

[R2-2202437](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202437.zip) Remaining issues on time synchronization enhancement OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202580](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202580.zip) Left issues for time synchronization Lenovo, Motorola Mobility discussion Rel-17

[R2-2202708](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202708.zip) Discussion on remaining issues for accurate time synchronization Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202728](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202728.zip) Remaining Issues on PDC Enhancement CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202750](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202750.zip) Remaining issues of time synchronization ZTE Corporation, Sanechips, China Southern Power Grid Co., Ltd discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202784](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202784.zip) Simplifying the PRS procedure forRemaining Issues of RTT-based PDC CATT discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202894](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202894.zip) Remaining issues for PDC vivo discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2203197](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203197.zip) Propagation Delay Compensation signalling Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2203303](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203303.zip) MAC CE update for SRS Spatial Relation Indication Ericsson discussion NR\_IIOT\_URLLC\_enh

[R2-2203461](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203461.zip) Propagation Delay Compensation for TSN Qualcomm Incorporated discussion Rel-17

### 8.5.3 Uplink enhancements for URLLC in unlicensed controlled environments

Contributions should only be focused on important issues not included in open issues email discussion. Proposals related to DRX HARQ RTT timer for one-shot HARQ feedback for NR-U will be treated in in this AI taking into account R2 116-e agreement for [R2-2110948](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2110948.zip) and RAN1 agreements. The Rel-17 RAN1 enhancements one-shot request per HARQ process should be consistend with solution for Rel-16 NR-U where all HARQ processes are enabled.

[R2-2202444](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202444.zip) Discussion on the DRX impact of enhanced HARQ feedback and intra-UE prioritization Lenovo, Motorola Mobility discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202946](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202946.zip) Configured grant mode switching for IIoT/URLLC in UCE III discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2203294](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203294.zip) RAN2 impacts of RAN1 Agreements on Enhanced HARQ feedback Qualcomm Incorporated discussion

[R2-2203304](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203304.zip) Multi-TB scheduling in UCE Ericsson discussion NR\_IIOT\_URLLC\_enh

### 8.5.4 RAN enhancements based on new QoS

Contributions should only be focused on important issues NOT included in open issues email discussion.

[R2-2203734](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203734.zip)

[R2-2202283](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202283.zip) Analysis on N>1 Fujitsu discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2200309](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2200309.zip)

[R2-2202284](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202284.zip) Survival Time Mode and Measurement Gap Fujitsu discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2200310](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2200310.zip)

[R2-2202438](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202438.zip) Remaining issues on survival time OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202445](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202445.zip) Remaining issues on the support of survival time Lenovo, Motorola Mobility discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202523](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202523.zip) Remaining issues on RAN enhancements for new QoS Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202709](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202709.zip) Discussion about UE behaviours for Survival Time state operation Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202726](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202726.zip) Remaining Issues on QoS enhancement CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202751](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202751.zip) N and combined Tx-side timer for IIoT QoS ZTE, Sanechips, China Southern Power Grid Co., Ltd, TCL Communication Ltd., vivo discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2200704](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2200704.zip)

[R2-2202785](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202785.zip) On the support of N>1 for Survival Time solution CATT discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202834](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202834.zip) Additional aspects on resource in Survival Time III discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2202895](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202895.zip) Discussion on Radio Resource for the duplicated legs in ST vivo discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2203125](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203125.zip) Remaining issues of survival time requirements Xiaomi Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2201375](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2201375.zip)

[R2-2203144](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203144.zip) Finalising Survival Time related enhancements Samsung Electronics GmbH discussion

[R2-2203198](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203198.zip) On Closure of Survival Time Objective Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2203460](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203460.zip) Remaining issues on the support of survival time InterDigital discussion Rel-18 NR\_IIOT\_URLLC\_enh-Core

## 8.6 Small Data enhancements

(NR\_SmallData\_INACTIVE-Core; leading WG: RAN2; REL-17; WID: RP-212594)

Time budget: 1.5 TU

Tdoc Limitation: 2 tdocs

### 8.6.1 Organizational

In coming LSs, rapporteur input for email discussions summaires etc (tdocs in this don’t count towards tdoc limit).

Inputs expected for 38.321 CR (Huawei), 38.331 CR (ZTE), 38.300 CR (Nokia)

Including [Post116-e][506][SDT] RRC running CR update (ZTE), [Post116-e][507][SDT] MAC running CR update (Huawei), and [Post116-e][508][SDT] Stage-2 running CR update (Nokia)

[R2-2202143](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202143.zip) Reply LS on the ROHC continuity for SDT (R3-221471; contact: Huawei) RAN3 LS in Rel-17 To:RAN2

=> Noted

[R2-2202144](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202144.zip) LS on handling of DL non-SDT during SDT procedure (R3-221472; contact: CATT) RAN3 LS in Rel-17 To:RAN2

- CATT indicates that this is discussed in CP issue

=> Discuss in the CP issue and then send reply LS after reaching RAN2 agreement

=> Noted

[R2-2203722](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203722.zip) Reply LS on Security of Small data transmission (S3-220463; contact: Intel) SA3 LS in Rel-17 NR\_SmallData\_INACTIVE-Core To:RAN2 Cc:RAN3

=> CCCH solution will no longer be pursued for non-SDT data arrival for Rel-17

=> Noted

[R2-2202594](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202594.zip) Running MAC CR for small data Huawei, HiSilicon draftCR Rel-17 38.321 16.7.0 B NR\_SmallData\_INACTIVE-Core Withdrawn

Withdrawn

[R2-2202595](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202595.zip) Summary of [Post116-e][507][SDT] MAC running CR update (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core Withdrawn

Withdrawn

[R2-2202612](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202612.zip) Summary of [POST116bis-e][510][Sdata] Running MAC CR Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

Withdrawn

CRs

[R2-2203279](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203279.zip) Stage-2 introduction of SDT Nokia, Nokia Shanghai Bell CR Rel-17 38.300 16.8.0 0357 6 B NR\_SmallData\_INACTIVE-Core [R2-2202014](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202014.zip)

=> The CR is endorsed

[R2-2203296](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203296.zip) Introduction of SDT ZTE Corporation (rapporteur) CR Rel-17 38.331 16.7.0 2937 - B NR\_SmallData\_INACTIVE-Core Late

=> The CR is endorsed

[R2-2202611](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202611.zip) Introduction of Small Data Transmission for MAC spec Huawei, HiSilicon CR Rel-17 38.321 16.7.0 1198 - B NR\_SmallData\_INACTIVE-Core Late

- LG points out a few issues that were identified.

=> The CR is endorsed

Capabilities

[R2-2202672](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202672.zip) UE capabilities for Rel-17 SDT Intel Corporation draftCR Rel-17 38.306 16.7.0 B NR\_SmallData\_INACTIVE-Core

=> Will use as baseline for email discussion review

[R2-2202673](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202673.zip) UE capabilities for Rel-17 SDT Intel Corporation draftCR Rel-17 38.331 16.7.0 B NR\_SmallData\_INACTIVE-Core

=> Will use as baseline for email discussion review

### 8.6.2 User plane common aspects

Including email discussion [POST116bis-e][510][Sdata] UP open issues (Huawei) – NO contributions on these issues.

Any other contributions should focus on important issues not covered by open issues email discussions. Issues that have been discussed and not agreed in the past should not be brought again, unless there is large support (i.e. large number of companies co-sourced contributions)

[R2-2202609](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202609.zip) Summary of [POST116bis-e][510][Sdata] UP open issues (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

*Proposal6: Consider cg-SDT-TimeAlignmentTimer to be expired and perform the procedure in 5.2 (Maintenance of uplink time alignment) at MAC reset. FFS impacts for delta configuration. (18/21)*

- Intel doesn’t agree with the way this is captured, the CG timer expiry causes release of the configuration and it shouldn’t.

- Huawei understood that we agreed to release the configuration. Intel understood that we don’t release the configuration in the RRC, just the resources/CG and not the configuration.

*Proposal8: Adopt the same sdt-RSRP-ThresholdSSB-SUL used in MAC for uplink carrier selection for RA-SDT and CG-SDT. FFS relationship with RACH partitionining discussion and how to enable this in RRC configuration. (20/21)*

- Huawei is concerned with the complexity this introduces with RA partitioning. Ericsson agrees and maybe we have to see if we make a common threshold for a feature combination.

*Proposal10: UE triggers SDT failure when the number of preamble transmission in RA-SDT exceeds the threshold preambleTransMax. (20/21) FFS for RACH triggered during subsequent transmission for both CG-SDT and RA-SDT.*

- InterDigital asks if we are adding a new failure on top of the RRC timer. Huawei explains that this will need some change. CATT has some concerns on the behaviour in case of failure and this proposal overlaps with proposal 8 in CP. LG has same understanding that Huawei this is another trigger for failure.

- ZTE understood in CP discussion as legacy behaviour, preamble transmission will continue and we wait for timer. Samsung, Lenovo, Oppo, prefer to follow legacy. Intel and QC would prefer to keep the UE in INACTIVE and allow UE to trigger legacy resume

=> cover this issue in UP email discussion

**Agreements**

1. Downlink RSRP reference at the time of receiving RRCRelease with suspendConfig for the RSRP-based TA validation is determined by the MO configured for the cell where the UE is released from RRC\_CONNECTED to RRC\_INACTIVE. FFS if there is any issues from RAN4 raised
2. Consider cg-SDT-TimeAlignmentTimer to be expired and perform the procedure in 5.2 (Maintenance of uplink time alignment) at MAC reset. Ensure in the CR that the configuration is not released (i.e. remove notification from MAC CR to release the configuration). FFS impacts for delta configuration.
3. For autonomous re-tx, fix the RV to be 0 for both the initial and retransmission of initial CG-SDT transmission. Inform RAN1?
4. [CB] Adopt the same sdt-RSRP-ThresholdSSB-SUL used in MAC for uplink carrier selection for RA-SDT and CG-SDT. FFS relationship with RACH partitioning discussion and how to enable this in RRC configuration. FFS if threshold is common for a feature combination
5. [CB cover it in email discussion] UE triggers SDT failure when the number of preamble transmission in RA-SDT exceeds the threshold preambleTransMax. (20/21) FFS for RACH triggered during subsequent transmission for both CG-SDT and RA-SDT.
6. CG-SDT resources are not used during an RA-SDT. Consider the CG-SDT-TAT as expired at the initiation of an RA-SDT procedure
7. UE stops the legacy TAT when contention resolution is successful for RACH triggered during CG-SDT
8. Similar to legacy, any pdcch addressed to C-RNTI for initial CG transmission should be treated as a confirmation of successful initial CG transmission regardless of HARQ PID

Issues that R2 needs to further discuss

Proposal2: UE does not stop the legacy TAT when contention resolution is successful for RACH triggered during CG-SDT. (14/21)

- Ericsson asks if we need to explain what happens when it expires? Huawei has the same concern as Ericsson as the action when legacy TAT expires shouldn’t apply when CG TAT is running. LG indicates that legacy TAT would not impact SDT resources so the resources shouldn’t be released at expiry.

- Nokia, ZTE, QC, Vivo, Ericsson and Lenovo ask why we need the new timer, when we have the legacy timer. Qualcomm would prefer one timer running only at a time. Legacy timer should be kept.

- Intel understood that by having both it would allow the UE to know the previous CG configuration is invalid.

*Proposal4: R2 to confirm that no new trigger is introduced for RACH due to CG-SDT SSB selection.*

- LG thinks that if we don’t agree to a new trigger there is no new trigger so no point to having this proposal

Proposal5: R2 to dicsuss whether UL new transmission scheduled by DG for a HARQ PID different from the one used for initial UL transmission can be an ACK for the initial transmission. (12/19)

- InterDigital indicates that we agreed that ACK can be delivered in two ways, either subsequent transmissions or NDI for same HARQ.

- Intel thinks that we should not include anything new on top of current behaviour.

Proposal9: R2 to downselect during online dicsusison

 Option1: Leave it to UE implementation that the old SRB data are not counted in the data volume calculation

 Option2: UE performs SDU discard at the reception of RRCRelease with SDT configuration

[R2-2203731](C:\\Users\\panidx\\OneDrive - InterDigital Communications, Inc\\Documents\\3GPP RAN\\TSGR2_117-e\\Docs\\R2-2203731.zip) Summary of remaining user plane issues for SDT InterDigital

Proposals with a large majority

Proposal 1: the UE determines the LCG associated with an SDT DRB from the stored configuration in the UE context (i.e. from LogicalChannelConfig in RLC-BearerConfig stored for the DRB) (16/20)

Proposal 2: It is up to the network how to configure the logicalChannelSR-Mask value for LCHs of DRBs configured for SDT. (16/20)

Proposal 3: UE-autonomous switching from RA-SDT to normal/legacy RACH after a configured number of failures is not supported. (17/20)

Proposal 4: Existing values for of ra-ContentionResolutionTimer and msgB-ResponseWindow can be reused for SDT. No need to introduce new configuration values. (17/20)

Proposal 5: Confirm earlier agreement: During subsequent CG transmission phase (i.e. after the UE has received response from NW), if there is no available SSB above the configured RSRP CG-SDT threshold, the HARQ entity doesn’t use the CG-SDT resource, and the UE triggers SR when there is no valid UL grant (UE falls back to legacy RA for SR) (19/20).

Proposal 6: During subsequent CG transmission phase (i.e. after the UE has received response from NW), if there at least one available SSB above the configured RSRP CG-SDT threshold, it is up to UE implementation to select an SSB above the RSRP threshold (19/20).

Proposal 7: For RA initiated after CG-SDT, the UE multiplexes a C-RNTI MAC CE instead of RRC resume request in Msg3 or MsgA (20/20)

Proposal 8: If CG-SDT-TAT expires while the CG-SDT procedure is ongoing and if UE has not received a response from the network after the initial UL CG-SDT transmission, UE terminates ongoing SDT procedure (15/20). FFS follow-up UE behaviour (e.g. whether the UE triggers SDT failure and goes to IDLE mode).

Proposal 9: UE performs SDU discard for SRBs at the reception of RRCRelease with SDT configuration. (20/20)

Proposal 15: No support expressed for the following proposals:

- Allow the UE to rebuild the TB upon transmitting it again on CG-SDT, for the benefit of updating the BSR MAC CE (1/20)

- SDT DRBs that cannot be multiplexed on SDT resources available in the current SDT procedure due to LCH restrictions are considered as non-SDT DRBs for the duration of the SDT procedure (2/20)

- UE does not update nor increase Bj while in Inactive state, i.e. between the reception time of RRC release message and the initiation of the SDT procedure (1/20)

- Allow the UE to switch to RA-SDT (if the RA-SDT criteria is met) when the initial TB is not successfully transmitted in the initial phase of CG-SDT (2/20)

- maintain uplink timing alignment by gradually adjusting uplink timing when there is a DL timing difference from the DL timing reference observed by the UE (1/20)

- power ramping for CG-SDT retransmissions, i.e. after the expiry of the cg-SDT-retransmissionTimer (1/20)

Proposals for further discussion:

Proposal 10: UE follows the legacy behaviour upon the expiry of the ConfiguredGrantTimer (16/19).

Proposal 11: Reference RSRP value for RSRP-based TA validation in MAC is captured by referring to RAN4 procedural text, e.g. MAC considers the TA valid if "The change in the RSRP of the downlink pathloss reference calculated as specified in 38.133 section 5.x [11] is less than cg-SDT-RSRP-ChangeThreshold." (13/20)

Proposal 12: RAN2 to discuss:

- Capture the beam consolidation procedure text for RSRP-based TA validation in RRC (9/20)

- Capture the beam consolidation procedure text for RSRP-based TA validation in MAC (11/20)

Proposal 13: RAN to discuss and clarify that:

The UE restarts the CG-SDT-TAT when the contention resolution is successful for a legacy RACH procedure initiated during CG-SDT procedure (due to absence of UL resource).

Proposal 14: RAN2 to discuss whether to capture and clarify in stage-2 spec which MAC CEs are used or not used in INACTIVE state.

[R2-2202274](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202274.zip) Discussion on user plane issues of SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202342](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202342.zip) CG-SDT-TAT expiry handing during the CG-SDT procedure Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202446](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202446.zip) Remaining UP issues for SDT Lenovo, Motorola Mobility discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202610](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202610.zip) Remaining issues for SDT user plane Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202735](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202735.zip) Remaining issues of user plane aspects of SDT China Telecom discussion

[R2-2202959](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202959.zip) Remaining issues on UP aspects of SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202983](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202983.zip) Remaining UP Issues on SDT Procedure vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2203008](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203008.zip) Remaining user plane aspects of SDT NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2203158](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203158.zip) User Plane Aspects for SDT Ericsson discussion Rel-17 NR\_MT\_SDT-Core Late

[R2-2203280](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203280.zip) UP and CG aspects for SDT Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2203458](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203458.zip) Remaining UP issues for SDT InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core

### 8.6.3 Control plane common aspects

Including email discussion [POST116bis-e][511][Sdata] CP open issues (ZTE) - NO contributions on these issues

Any other contributions should focus on important issues not covered by open issues email discussions. Issues that have been discussed and not agreed in the past should not be brought again, unless there is large support (i.e. large number of companies co-sourced contributions)

One co-sourced contributions and/or TPs on DCCH/CCCH solution will not count towards contribution limit.

[R2-2203300](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203300.zip) [POST116bis-e][511][Sdata] - CP open issue list summary ZTE Wistron Telecom AB report

=> Revised in [R2-2203716](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203716.zip)

[R2-2203716](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203716.zip) [POST116bis-e][511][Sdata] - CP open issue list summary ZTE Corporation (rapporteur) report Rel-17 NR\_SmallData\_INACTIVE-Core

**Agreements**

1. When CG-TAT expires, MAC shall release the CG resources. RRC keeps the CG configuration (for delta signalling).
2. Add a condition that RNAU is only initiated if Txxx (i.e. the new SDT timer) is not running
3. The UE is not required to perform/log measurements during SDT
4. The UE is not required to perform Idle/inactive measurements in section 5.7.8 of RRC during SDT. Check the details of this requirements
5. Delta signalling is based on the previous SDT configuration (i.e. only applicable to SDT operation and will be released when the UE moves to connected and hence delta configuration based on connected mode CG configuration is not supported). FFS other details
6. for ROHC continuity, update the running CR as follows:
7. “the cell for ROHC continuity is the PCell where the UE receives the RRCRelease message”

**Proposal 4**

- Intel asks if we need to ask RAN4 for performance impact

LS to RAN4 (ZTE) [CB]

- Inform RAN4 of our agreements

Proposals for discussion for essential issues:

Proposal 5: use the following values for SDT error detection timer (discuss together with P18)

t3XX ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms2000, ms3000, ms6000, ms10000, spare6, spare5, spare4, spare3, spare2, spare1}

Proposal 7: When SDT is initiated, RRC will indicate the selected carrier to MAC

|  |
| --- |
| Note: MAC will still perform carrier selection for this and indicate this to RRC which will just be informed for the RACH selection purpose by RRC. As below:  Timeline  Description automatically generated with low confidence |

Proposal 8: RLC failure handling needs to be added in RRC but Max RACH preamble transmission indication from lower layers leads to no response in RRC (same as legacy).

Proposal 10: UE supporting CG-SDT shall also support RA-SDT (10/4)

Proposal 11: RA-SDT is defined as an optional capability per UE without need for xDD and FRx differentiation

Discuss per UE vs per band

Proposal 12: CG-SDT is defined as an optional capability per UE without need for xDD and FRx differentiation

Proposal 13: Discuss whether separate capability is needed for SRB (i.e. for NAS messages)

Proposal 14: Discuss whether separate capability is needed for multiple CG-SDT configured grants

Proposal 15: Discuss the following options for RRCReject

Option 1: No change (i.e. EDT behaviour is followed)

If option 1 is agreed we can discuss whether we need a note that says: *“UE shall avoid a consecutive SDT procedures with a different payload but same security key”*

Option 2: RRCReject is not supported for SDT

Option 3: Release SDT configuration upon receiving RRCReject

Proposal 16: The following is used for sdt-DataVolumeThreshold

ENUMERATED {byte10, byte14, byte20, byte28, byte38, byte53, byte74, byte102, byte142, byte198, byte276, byte384, byte535, byte745, byte1038, byte1446}

Proposal 17: DataVolumeThreshold is configured only in SIB1

Proposal 18: Implement longer CG-SDT periodicity values similar to PUR and send an LS to RAN1 to check if this is okay.

**Proposals for enhancements (comeback after all essential issues are dealt with):**

Proposal 19: Discuss whether RAI should be introduced for SDT

Proposal 20: Discuss whether CG resource request message is supported for SDT

[R2-2203732](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203732.zip) Summary of [AT117-e] [501] [ Sdata] CP additional open issues (Samsung) Samsung

Easy Agreements

Proposal 1 (Easy): DataVolumeThreshold is configured only in SIB1.

Proposal 4 (Easy): RA-SDT is defined as an optional capability per UE without need for xDD and FRx differentiation.

Proposal 12 (easy): For handling RRC Reject during SDT procedure, No change (i.e. EDT behaviour is followed).

Proposal 15 (Easy): SDT cannot be triggered if there is non-SDT data buffered at PDCP/RLC.

Proposal 16 (Easy): SDT can be configured only for SRB (i.e. without resuming any DRB). Define the sdt-DRB-List-r17 with the list starting in 0, or as SetupRelease type.

Proposal 17 (Seems Easy): If UE detects an SDT failure of ongoing SDT session for the transfer of NAS message, RRC informs NAS about the failure for NAS message transfer. Discuss further if any specification change is needed or not.

Proposal 22 (Easy): If T380 expires and UE receives RRCReject during SDT procedure, inorder to keep the periodic RNAU: UE sets the variable pendingRNA-Update to true.

Potential Agreements (Significant Majority)

Proposal 5 (19 out of 22): CG-SDT is defined as an optional capability per UE without need for xDD and FRx differentiation

Proposal 3 (17 out of 22): UE supporting CG-SDT shall also support 4-step RA-SDT

Proposal 7 (19 out of 22): Separate capability is not needed for multiple CG-SDT configured grants

Proposal 10 (17 out of 22): When SDT is initiated, RRC will not indicate the selected carrier to MAC

Proposal 13 (15 out of 20): Note that says: “UE shall avoid a consecutive SDT procedures with a different payload but same security key” is not added to specification.

Proposal 20 (17 out of 21): The nrofSS-BlocksToAverage configuration in SIB2 is reused for the RSRP change based TA validation.

Proposal 23 (12 out of 16): For handling the DL non-SDT data/signalling arrival during SDT procedure without anchor relocation: network use RAN paging to trigger the following-up RRC resume procedure after UE is moved to Inactive state.

Proposals which needs discussion

Proposal 2: For the configurable values of sdt-DataVolumeThreshold, large values considering maximum positioning SDU size and other use cases needs to be added.

Proposal 6 (Support 10, Not Support 7, No strong view 5): Separate capability is needed for SRB (i.e. for NAS messages)

Proposal 8: (15 out of 22): Do not support long CG-SDT periodicities

Proposal 9 (support 8): Use the following values for SDT error detection timer

t3XX ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms2000, ms3000, ms6000, ms10000, spare6, spare5, spare4, spare3, spare2, spare1}

Proposal 11 (14 out of 21): For handling RACH failure (i.e. that Max RACH preamble transmission is reached) during SDT procedure

- MAC indicates RACH problem indication to RRC. RRC does not any action for this indication similar to legacy operation in RRC\_INACTIVE/RRC\_IDLE. RA procedure is continued.

Proposal 14: For the non-SDT data arrival indication, select one of the following for DCCH solution

• Option 1: New message (10 companies support this)

• Option 2: reuse UAI (9 companies support this)

Proposal 18: Discuss whether CG parameters specific to unlicensed spectrum are applicable to SDT or not.

- View 1: RAN1 has not had any discussion on whether legacy values related to CG operation with NR-U and current TP allows the network to configure them via RRCRelease for CG-SDT operation

- View 2: We don’t need to agree anything, and we can just follow the WID for unlicensed band.

- View 3: Whether CG parameters specific to unlicensed spectrum are applicable or not for SDT would be up to NW configuration

- View 4: No impact to current CR

Proposal 19 (for discussion): When UE initiates resume for SDT and network responds with RRCReject (for congestion), or RRCSetup (for fallback to setup), for handling retransmission of the not acknowledged UL data that was included in the 1st UL SDT

- Option 1: it is left up to UE the decision on how to handle any retransmission of the not acknowledged UL data that was included in the 1st UL SDT.

- Option 2: Specification defines UE behaviour

- Option 3: No clarification is needed

Proposal 21: Discuss and agree on one of the following:

- Option 1 (2 companies): nrofSS-BlocksToAverage configuration is supported in RRC Release. The nrofSS-BlocksToAverage configuration in SIB2 is reused for the RSRP change based TA validation if nrofSS-BlocksToAverage configuration in RRC Release is absent.

- Option 2 (6 companies): nrofSS-BlocksToAverage configuration is not supported in RRC Release.

[R2-2202275](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202275.zip) Discussion on control plane issues of SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202556](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202556.zip) Control plane aspects of SDT Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202590](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202590.zip) Analysis on CP open issue of SDT Lenovo, Motorola Mobility discussion Rel-17

[R2-2202674](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202674.zip) Additional discussion on identified open CP issues Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202736](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202736.zip) Remaining issues of control plane aspects of SDT China Telecom discussion

[R2-2202805](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202805.zip) Handling of DL non-SDT during SDT CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

=> Revised in [R2-2203529](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203529.zip)

[R2-2203529](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203529.zip) Handling of DL non-SDT during SDT without Anchor Relocation CATT, Huawei, HiSilicon, China Telecom, CMCC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202846](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202846.zip) Remaining issue on CS-RNTI configuration for CG-SDT ASUSTeK discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202960](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202960.zip) Remaining issues on CP aspects of SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2202982](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202982.zip) Further Consideration on the Handling of non-SDT Data Arrival vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2201441](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2201441.zip)

[R2-2203009](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203009.zip) Remaining control plane aspects of SDT NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2203155](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203155.zip) CP aspects for SDT Ericsson discussion Rel-17 NR\_MT\_SDT-Core Late

[R2-2203299](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203299.zip) [POST116bis-e][511][Sdata] - Running CR comments summary ZTE Wistron Telecom AB report

[R2-2203337](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203337.zip) Control plane common aspects for SDT Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

[R2-2203338](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203338.zip) CCCH based non-SDT data indication Huawei, HiSilicon draftCR Rel-17 38.331 16.7.0 NR\_SmallData\_INACTIVE-Core Late

=> Revised in [R2-2203520](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203520.zip)

[R2-2203520](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203520.zip) CCCH based non-SDT data indication Huawei, HiSilicon, InterDigital, LGE, ASUSTeK, Nokia, Nokia Shanghai Bell, Google, Rakuten Mobile, Fujitsu, NEC, Ericsson draftCR Rel-17 38.331 16.7.0 NR\_SmallData\_INACTIVE-Core [R2-2203338](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203338.zip) Late

[R2-2203353](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203353.zip) SDT control plane aspects Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE

[R2-2203475](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203475.zip) Introduction of DCCH solution for non-SDT data arrival Intel Corporation, ZTE Corporation, Sanechips, Samsung, Xiaomi, MediaTek, Radisys, Reliance JIO, Qualcomm, CMCC, OPPO, Lenovo, Sony, Apple, CATT, AT&T draftCR Rel-17 38.331 16.7.0 NR\_SmallData\_INACTIVE-Core

=> Revised in [R2-2203528](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203528.zip)

[R2-2203528](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203528.zip) Introduction of DCCH solution for non-SDT data arrival Intel Corporation, ZTE Corporation, Sanechips, Samsung, Xiaomi, MediaTek, Radisys, Reliance JIO, Qualcomm, CMCC, OPPO, Lenovo, Sony, Apple, CATT, AT&T, T-Mobile, China Telecom draftCR Rel-17 38.331 16.7.0 NR\_SmallData\_INACTIVE-Core

## 8.18 RACH indication and partitioning

Time budget: Equivalent to 0.5-1 TU

Tdoc Limitation: 2 tdocs

Expected to cover WIs SDT, CovEnh, RedCap, RAN slicing. RA specific aspects from the different WI should be covered in this AI given the RA experts are all there.

### 8.18.1 Common signalling framework

Including output of [POST116bis-e][513][IIoT] CP open issues (Ericsson) – NO contributions on these issues

Any other contributions should focus on important issues not covered by open issues email discussions.

[R2-2203357](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203357.zip) Report of [POST116bis-e][515][RA Part] CP open issues Ericsson report Rel-17 NR\_redcap-Core, NR\_slice-Core, NR\_cov\_enh2-Core, NR\_SmallData\_INACTIVE-Core Late

=> Revised in [R2-2203701](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203701.zip)

[R2-2203701](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203701.zip) Report of [POST116bis-e][515][RA Part] CP open issues Ericsson report Rel-17 NR\_redcap-Core, NR\_slice-Core, NR\_cov\_enh2-Core, NR\_SmallData\_INACTIVE-Core Late

Based on the discussion in phase 2 the following intermediate conclusions are proposed:

**Agreements**

1 Use the current base line without the *FeatureCombination* in *RACHcommonConfig*

2 Mapping between 2-step RA preambles and PUSCH resources for MsgA to be included in a Running CR update (i.e. per feature combination PUSCH resources for msgA are allowed)

3 As CE is agreed as part of feature combination, the inclusion in updated Running CR is kept with Editor’s note/FFS removed

4 Do not update Maximum number of additional RACH configurations in Running CR. FFS on what the max is based on possible combinations

5 The current draft signalling for Slicing is kept for now, pending Slicing progress on details. As a baseline per slicing agreements we consider at least the following two parameters for feature combination: backoffindication and powerramping steps. Further parameters can be considered based on slicing progress.

6 As a baseline continue using optional “feature\_extension” to FeatureCombinationIndication.

7 No changes to the current RO to SSB mapping principle in Running CR. FFS if some adaptations may be needed for feature specific.

8 As a baseline - a priority is configurable per feature. FFS on details

If several partitions are available for more than one feature, the UE selects only between available partition(s) with the highest feature priority. Details FFS.

9 FFS Include mapping of RACH resources to additional search space acc. to agreements in Running CR.

1. Do not update Maximum number of additional RACH configurations in Running CR but agree as baseline [nrofSlices] \* 8 – 1

- Nokia asks why we are multiplying by 8.

1. The current draft signalling for Slicing is kept for now, pending Slicing progress on details.

- Slicing has agreed to two parameters and no more will be configured for slices.

[R2-2203735](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203735.zip)

[R2-2202558](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202558.zip) Signaling aspects of RACH partitioning Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core

[R2-2202693](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202693.zip) Remaining issues for signaling design for RACH partitioning CATT discussion Rel-17 NR\_cov\_enh-Core, NR\_slice-Core, NR\_SmallData\_INACTIVE-Core, NR\_redcap-Core Withdrawn

[R2-2203063](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203063.zip) Discussion on RO sharing cases for common RACH configuration LG Electronics Inc. discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core

[R2-2203339](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203339.zip) Common signalling for RACH indication and partitioning Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core Late

[R2-2203356](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203356.zip) RSRP Thresholds for RACH Partitioning Ericsson discussion Rel-17 NR\_redcap-Core, NR\_slice-Core, NR\_cov\_enh-Core Late

[R2-2203358](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203358.zip) Introduction of common RACH partitioning aspects in RRC Ericsson (rapporteur) CR Rel-17 38.331 16.7.0 2951 - B NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core Late

[R2-2203393](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203393.zip) Further Discussion on RACH Partitioning in RA Configuration Aspect vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh, NR\_redcap-Core, NR\_slice-Core [R2-2201597](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2201597.zip)

[R2-2203405](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203405.zip) Slice-specific RACH prioritization in Common RACH Framework Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_slice-Core

### 8.18.2 Common aspects of RACH procedure

Including output of [POST116bis-e][514][RA Part] UP open issues (ZTE) – NO contributions on these issues

Any other contributions should focus on important issues not covered by open issues email discussions.

[R2-2203309](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203309.zip) [POST116bis-e][514][RA Part] - Open issue list summary ZTE Corporation (rapporteur) report Rel-17 Late

**Agreements**

1 Carrier selection happens before RACH partition is selected

2 Carrier selection threshold is common to all BWPs (same as legacy)

Proposal 1: Carrier selection happens before RACH partition is selected (11 vs 2)

- Qualcomm is concerned with this proposal, it is against the individual WI agreements. It should be included in the RACH partition configuration

Proposal 2: Carrier selection threshold is common to all BWPs (same as legacy)

Proposal 3: The CE/non-CE selection threshold can then be configured per BWP (as agreed in the CE session)

Proposal 4: For overall MAC procedure (order of steps is as below):

RRC will indicate to MAC whether SDT, REDCAP, SliceX is applicable for any RACH

If SDT is applicable, MAC would have checked already that the correct RACH partition is available (this is also discussed as part of SDT)

If carrier is not indicated by RRC, MAC will select the carrier (this is same as legacy)

MAC will perform BWP selection (this is also legacy behaviour)

MAC will determine CE applicability after BWP is selected

Finally, MAC will select the RACH partition

Proposal 5: BWP selection is handled in REDCAP CR.

Proposal 6: rsrp-Threshold-Msg3Rep is configured per BWP

Proposal 7: RSRP threshold for SSB selection for CE be configured differently in different RACH partitions (note this is conditional IE configured only in rach partitions that support CE)

Proposal 8: RACH partitioning can be applicable also in connected mode (FFS if any changes are needed in MAC for this)

Proposal 9: In case of CFRA, in order to initialize the RACH parameters such as rsrp-ThresholdSSB etc and for CBRA fallback:

Option 1: Network signals an explicit RACH partition to be used

Option 2: UE performs RACH partition selection up front

In case of option 2 it is not clear if network and UE will have the same understanding of the parameters to be used.

Proposal 10: For the REDCAP BWP, network configures a RACH partition which is applicable to REDCAP (i.e. without combination with other features), similar to “legacy” RACH partition in non-Redcap initial BWP

Proposal 11: The network may configure a separate search space for RAR/MSGB per RACH partition (to be captured in RRC CR if agreed). No other mechanism is pursued apart from this for handling the RNTI collision problem.

[R2-2203736](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203736.zip)

[R2-2202694](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202694.zip) Remaining issues for common aspects of RACH procedure CATT discussion Rel-17 NR\_cov\_enh-Core, NR\_slice-Core, NR\_SmallData\_INACTIVE-Core, NR\_redcap-Core

[R2-2202976](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2202976.zip) Discussion on RACH partition UP open issues OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core

[R2-2203206](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203206.zip) RNTI collision issue for different features in NR Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2200917](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2200917.zip)

[R2-2203283](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203283.zip) Common aspects for RACH partitioning Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2203307](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203307.zip) Introduction of common RACH partitioning aspects in MAC ZTE Corporation (rapporteur) CR Rel-17 38.321 16.7.0 1214 - B NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core Late

[R2-2203340](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203340.zip) Further details of RACH procedure with RACH partitioning Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core Late

[R2-2203459](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_117-e\Docs\R2-2203459.zip) Remaining issues for RACH partitioning InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core