3GPP TSG-RAN WG2 Meeting #122 [R2-2306543](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306543.zip)

Incheon, Korea, May 22-26, 2023

Source: Session Chair (InterDigital)

Title: Report from Session on NES, UAV, Rel-15-17 UP, Rel-17 Small Data, IIoT/URLLC, and RACH partitioning

**Email discussions:**

* [AT121bis-e][300] Organizational Diana – NES, UAV, UP R15-17 UP/SDT

Scope:

* + - Share plans for the meetings and list of ongoing email discussions for the sessions related to Rel-17 URLLC/IIoT, Small data, RA Partitioning, R15-16 UP, Rel-18 UAV and NES
    - Share meetings notes and agreements for review and endorsement

# 5 NR Rel-15 and Rel-16

Essential corrections only.

Tdoc Limitation: 8 tdocs in total for all sub agenda items.

In case a correction need to be reflected in both NR TS and LTE TS, the corrections should be submitted under one single AI (so the NR and LTE correction can be treatee together), the sub-AIs below this

## 5.1 Common

Includes the following WIs and input that doesn’t fit elsewhere.

(NR\_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; closed: Jun. 19: WID: RP-191971)

(NR\_IAB-Core; leading WG: RAN2; REL-16; started: Dec 18; target Aug 20; WID: RP-200840)

(NR\_unlic-Core; leading WG: RAN1; REL-16; started: Dec 18; Closed June 20; WID: RP-192926).

(NR\_IIOT-Core; leading WG: RAN2; REL-16; started: Mar 19; Completed: Jun 20; WID: RP-200797)

(NR\_UE\_pow\_sav-Core; leading WG: RAN1; REL-16; started: Mar 19; Completed Jun 20; WID: RP-200494).

(NR\_2step\_RACH-Core; leading WG: RAN1; REL-16; started: Dec 18; Completed: June 20; WID: RP-200085).

(SRVCC\_NR\_to\_UMTS-Core; leading WG: RAN2; REL-16; started: Dec 18; Completed; Mar 20; WID: RP-190713)

(RACS-RAN-Core, leading WG: RAN2; REL-16; started: Mar 19; completed: Jun 20; WID: RP-191088)

(NG\_RAN\_PRN-Core; leading WG: RAN3; REL-16; started: Mar 19; completed: June 20; WID: RP-200122)

(NR\_eMIMO-Core, leading WG: RAN1; REL-16; started: Jun 18; target; Aug 20; WID: RP-200474;)

(NR\_CLI\_RIM; leading WG: RAN1; REL-16; started: Dec 18; Completed: Jun 20; WID: RP-191997;)

(NR\_L1enh\_URLLC-Core, leading WG: RAN1; REL-16; Completed: June 20; WID: RP-191584)

(LTE\_NR\_DC\_CA\_enh-Core; leading WG: RAN2; REL-16; started: Jun 18; Target Aug 20; WI RP-200791)

(NR\_Mob\_enh-Core; leading WG: RAN2; REL-16; started: Jun 18; Completed June 20; WID: RP-192277).

(NR\_HST, NR\_RRM\_enh-Core, NR\_RF\_FR1, NR\_RF\_FR2\_req\_enh, NR\_n66\_BW, LTE\_NR\_B41\_Bn41\_PC29dBm-Core, NR\_CSIRS\_L3meas,)

(NR TEI16).

LTE mob enh corrections that are common with NR mobility enhancements should be submitted to this AI.

### 5.1.2 User Plane corrections

User Plane corrections will be handled in the User Plane break out session

#### 5.1.2.0 In-Principle-Agreed CRs

#### 5.1.2.1 MAC

#### 5.1.2.2 RLC PDCP SDAP BAP

#### 5.1.2.3 Other

User plane related corrections that should be handled in User plane break out session.

# 6 NR Rel-17

## 6.1 Common

(NR\_MG\_enh-Core; leading WG: RAN4; REL-17; WID: RP-211591)

(NR\_UDC\_enh-Core; leading WG: RAN2; REL-17; WID: RP-211203)

(NG\_RAN\_PRN\_enh-Core; leading WG: RAN3; REL-17; WID: RP-202363)

(NR\_IAB\_enh-Core; leading WG: RAN2; REL-17; WID: RP-211548)

(NR\_UE\_pow\_sav\_enh-Core; leading WG: RAN2; REL-17; WID: RP-212632)

(LTE\_NR\_DC\_enh2-Core; leading WG: RAN2; REL-17; WID: RP-201040)

(LTE\_NR\_MUSIM-Core; leading WG: RAN2; REL-17; WID: RP-212610)

(NR\_Slice -Core; leading WG: RAN2; REL-17; WID: RP-212534)

(NR\_QoE-Core; leading WG: RAN3; REL-17; WID: RP-211406)

(NR\_ext\_to\_71GHz-Core; leading WG: RAN1; REL-17; WID: RP-212637)

(NR\_cov\_enh-Core; leading WG: RAN1; REL-17; WID: RP-211566): non-RACH-indication parts

(NR\_redcap-Core; leading WG: RAN1; REL-17; WID: RP-211574)

(NR\_feMIMO-Core; leading WG: RAN1; REL-17; WID: RP-212535)

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

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

PRACH partitioning items

NR TEI17: Corrections are accepted. New TEI17 tech proposal requirements: a) authored by an operator (and preferably co-signed by more), AND: b) resolves a concrete problem in the market for this operator (no new vendor initiated enhancements).

Includes Rel-17 Work Items without specific R2 Agenda Item, e.g. RAN1 and RAN4 led items, SA2 and CT1 led items (was previously “Rel-17 Other”)

Includes aspects that does not fit under the more specific AIs, e.g. multi-WI aspects.

Tdoc Limitation: 10 tdocs

### 6.1.2 User Plane corrections

User Plane Related aspects will be handled in the User Plane break out session. (exception: TEI new proposals if any).

#### 6.1.2.0 In-Principle-Agreed CRs

[R2-2304791](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304791.zip) Correction to CG-SDT LCH restriction Huawei, HiSilicon CR Rel-17 38.321 17.4.0 1580 2 F NR\_SmallData\_INACTIVE-Core [R2-2304351](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304351.zip)

=> the CR is agreed

[R2-2305463](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305463.zip) Corrections on SDT using NCD-SSB for RedCap Huawei, HiSilicon CR Rel-17 38.321 17.4.0 1584 2 F NR\_redcap-Core [R2-2304443](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304443.zip)

- Vivo would like to move this text to SDT section. Huawei and Ericsson think that this is sufficient.

=> Understanding is that this note covers both CG and RA SDT

=> The CR is agreed

[R2-2305856](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305856.zip) Clarification on RA Resource Selection During CG-SDT vivo, ZTE Corporation (rapporteur), Sanechips CR Rel-17 38.321 17.4.0 1576 2 F NR\_SmallData\_INACTIVE-Core [R2-2304446](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304446.zip)

=> The CR is agreed

#### 6.1.2.1 Other

[R2-2304727](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304727.zip) Correction to RA partition selection for Msg1 based SI request Samsung Electronics Co., Ltd CR Rel-17 38.321 17.4.0 1613 - F NR\_cov\_enh-Core, NR\_redcap-Core, NR\_SmallData\_INACTIVE-Core, NR\_slice-Core

- CATT doesn’t think this is needed. LG thinks that this is good intention but we should use the same as contention free resource. Samsung clarifies that in the MAC we use different terminology so that’s why we need the CR.

- Qualcomm thinks that nothing is broken and the network can configure the UE in a consistent way. Ericsson and Vivo agrees. ZTE clarifies that for Redcap we need to initialize the UE to use redcap resources and the intention is correct and they are ok to simplify in line with LG’s comment.

=> The CR will move to offline to discuss the need for the CR and finalize CR [301]

[R2-2304906](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304906.zip) Correction on SDT with separate initial BWP vivo, Huawei, HiSilicon, Guangdong Genius CR Rel-17 38.321 17.4.0 1616 - F NR\_redcap-Core, NR\_SmallData\_INACTIVE-Core [R2-2302660](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2302660.zip)

- Xiaomi thinks we need more discussion for CG SDT as RAN1 still needs more discussion on what PDCCH UE monitors. Vivo has the understanding that even CG SDT monitors initial BWP.

- LG agrees that this is not clearly specified in MAC but it is very clear in the RRC spec and there is no need to specify in both. Vivo explains that in RRC it is just configuration and in MAC we have UE behavior.

- Nokia thinks it is obvious that the RRC will configure it right and there is no need to clarify. Ericsson has the same understanding and reminds us that we added clarifications in the RRC spec and it is very clear.

- Qualcomm thinks that the network has to monitor the search space that the network configures but it would be good to clarify it in RRC.

- ZTE agrees is ok with the CR but I heard similar comments. Huawei thinks that we need to clarify the PDCCH monitoring behaviour that is not clear in RRC.

=> Offline to understand common understanding and see if CR is needed

[R2-2305748](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305748.zip) Correction on HARQ buffer flush at SCG deactivation Nokia, Apple, Mediatek, Qualcomm, Nokia Shanghai Bell CR Rel-17 38.321 17.4.0 1620 - F LTE\_NR\_DC\_enh2-Core

- Huawei thinks that when SCG is re-activated the network will anyways chose a new TB size so even if the UE misses the grant the UE will realize the TB mismatch and HARQ buffer will be flushed automatically when there is a new tx.

- Lenovo also thinks that this is a rare conditions and it is the UE missing the first PDCCH transmission but are ok if majority want it.

- LG clarifies that last meeting most companies thought that the toggling of NDI would solve the problem and most likely the PTAG will be expired and the case is extremely rare. CATT agrees that this is very very corner case and the network is all knowing and knows the issue may occur when re-activated.

- Mediatek explains that this is clearly an oversight as we have this for all other cases and we should fix this oversight and the UE should behave the same.

- Samsung also thinks that there is nothing broken and network can solve it.

- ZTE agrees with the intention and the impact is on the chipset and it is cleaner to change it.

- LG thikns that if we agree to have a CR we don’t need to check if PTAG is running. Nokia thinks that we can remove.

=> Offline whether if agreable and what release

[R2-2305749](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305749.zip) Clarification on unknown, unforeseen and erroneous protocol data during SDT Nokia, Intel, Mediatek, Nokia Shanghai Bell CR Rel-17 38.321 17.4.0 1621 - F NR\_SmallData\_INACTIVE-Core

- Vivo agrees with the intention but the legacy text has covered this case when the MAC resets. Ericsson also thought this was clear.

- LG explains that this text was written vaguely on purpose to cover all the cases and we should avoid listing all the cases.

- Lenovo thinks this is needed as the bearer is suspended.

- ZTE thinks that we should keep it general and not highlight SDT specifically. “When a MAC entity receives a MAC PDU for the MAC entity's C-RNTI or CS-RNTI, or by the configured downlink assignment, containing an LCID or eLCID value which is not configured or **LCID/eLCID associated to RBs not resumed**, the MAC entity shall at least:

=> offline [302]

[R2-2304907](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304907.zip) Correction on CG-SDT with NCD-SSB measurement vivo CR Rel-17 38.321 17.4.0 1617 - F NR\_redcap-Core, NR\_SmallData\_INACTIVE-Core

- ZTE clarifies that what we agreed last meeting covers both CG and RA SDT. Huawei agrees

- Ericsson also thinks it is clear

=> Company understanding is that the current NOTE is applicable to CG and RA SDT

=> the CR is not pursued

[R2-2306385](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306385.zip) Correction to carrier selection for RA-SDT Langbo CR Rel-17 38.321 17.4.0 1628 - F NR\_SmallData\_INACTIVE-Core

- Mediatek doesn’t see a need for a change and there is no problem

- LG thinks that this was discussed extensively in RA partition and it was concluded that there is no issue. Ericsson agrees

=> The CR is not pursued

[R2-2306495](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306495.zip) Correction on Enhanced BFR MAC CE ZTE Corporation, Sanechips CR Rel-17 38.321 17.4.0 1629 - F NR\_FeMIMO-Core

- Qualcomm thinks that the current text covers both cases

- Ericsson also understands that it covers the cases, it says one ore more. CATT, Huawei and Lenovo agrees with QC and Ericsson.

- LG agrees with ZTE

- Nokia thinks that CR is makes and the at least one BFD sets is referring to the case where we have more than on BFD sets and the case covered by CR is missing.

=> offline discussion [CB 303]

# 7 Rel-18

## 7.3 Network energy savings for NR

(Netw\_Energy\_NR -Core; leading WG: RAN1; REL-18; WID: RP-223540)

Time budget: 1 TU

Tdoc Limitation: 4 tdocs

### 7.3.1 Organizational

LS, workplan, email discussion etc

[R2-2304627](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304627.zip) LS on the enhancements to restricting paging in a limited area (R3-232084; contact: Nokia) RAN3 LS in Rel-18 Netw\_Energy\_NR-Core To:RAN2, SA2

- Nokia thinks that we should respond that there is no RAN2 impact. Huawei agrees but thinks we should wait for SA2 respond.

- Xiaomi is wondering if this solution works at all. Qualcomm thinks that there are impact to RAN2.

=> We will for SA2 to respond to RAN3

[R2-2306067](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306067.zip) Work plan for NR network energy savings Huawei, HiSilicon Work Plan Rel-18 Netw\_Energy\_NR

=> Noted

### 7.3.2 DTX/DRX mechanism

[R2-2305081](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305081.zip) Support high priority traffic in Cell DTX / DRX Apple, InterDigital, T-Mobile USA, MediaTek Inc., Intel discussion Rel-18 Netw\_Energy\_NR-Core

*Proposal 2: The UE can be configured per SR configuration whether to allow SR transmission associated with high priority LCH(s) during Cell DRX non-active period.*

- Vodafone would like to understand what the action would be from the system.

- Lenovo asks why we are limiting to just LCH and not SR for MAC CE (e.g. BFR). Qualcomm thinks that we can allow MAC CE for BFR. LG asks what type of traffic pattern is assumed. Apple explain that if it is an emergency call it is not a priority.

*Proposal 3: Reuse UE CDRX mechanism when the UE transmits SR during non-active duration of Cell DRX, i.e. the UE keeps monitoring PDCCH when a SR is sent on PUCCH and is pending.*

*Proposal 4: For the allowed SR during non-active duration of Cell DRX, no spec impact on its transmission behavior is foreseen, i.e. the SR can be retransmitted up to sr-TransMax and RACH is triggered when retransmission number is above the threshold.*

[R2-2305335](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305335.zip) Discussion on cell DTX-DRX mechanism vivo discussion Rel-18

*Proposal 3 RAN2 to confirm: As baseline, UE does not transmit SR occasions overlapping with Cell DRX non-active periods, and SR is not configurable to be transmitted during cell DRX non-active periods.*

[R2-2305435](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305435.zip) Emergency calls, Voice, Scheduling Requests and RACH Vodafone discussion Rel-18

*Proposal 1: Cell DTX/DRX should not be enabled in the cell where emergency calls are ongoing.*

*Proposal 2: Cell DTX/DRX should be disabled once the gNB is informed about the emergency call to be setup within RRC connection request/Resume Request.*

*Proposal 3: There are no specific designs for SR handling due to emergency calls once the UE is in active, but the gNB shall disable the cell DTX/DRX functionality once it is informed about emergency call (in this case from the CN).*

[R2-2306330](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306330.zip) Discussion on SR transmission during the Cell DRX non-active period NTT DOCOMO INC. discussion Rel-18 Netw\_Energy\_NR-Core

Propoasal 1 RAN2 to agree that SR exception handling should be configurable for emergency calls.

[R2-2305628](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305628.zip) Discussion on cell DTX/DRX CMCC discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 1: Traffic with high priority can transmit SR during the non-active period of Cell DTX/DRX.

Proposal 3: Inactivity timer is introduced for extend the fixed length on duration for a better transmission assurance. Whether it is only used for a new transmission or a it can also be used for retransmission can be further discussed.

[R2-2305205](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305205.zip) Discussion on Cell DTX/DRX Fujitsu discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305120](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305120.zip) Cell DTX-DRX Mechanism Qualcomm Incorporated discussion Rel-18

Proposal 5: Upon transmitting SR during cell DTX non-active period, RAN2 to consider introducing a short CellDTX\_SR timer to allow the UE to decode PDCCH, e.g., for an emergency call SR

Proposal 6: For SR that would be kept pending during cell DRX non-active period, a timer is configured by the gNB to control how long this SR can be kept pending in order to: 1. Avoid an immediate SR-RACH once cell DRX active time starts 2. Limit the amount of time SR can be kept pending.

R2-2305975 Remaining issues for Cell DTX/DRX ETRI

Proposal 1: Keep the agreement at the last meeting that no SR is transmitted during Cell DRX non-active period.

Proposal 2: Discuss whether RACH procedure is allowed when urgent uplink transmission is required during Cell DRX non-active period.

*Discussion*

- Xiaomi thinks that public safety should be prioritized over NES.

- Vodafone thinks that we should discuss all the use cases and explains that the cases of emergency is very rare an domes delay is accepted. What is not accepted is any kind of quality degradation and we shouldn’t allow an emergency call to have a 300ms duty cycle.

- Huawei also agrees with Vodafone. We have been using CS fallback so initial delays have been acceptable. Oppo agrees

- NEC thinks that if we allow to turn off the cell and if the UE wants to make the call the UE can use the coverage layer. ZTE thinks that we don’t need to have SR.

- CMCC would prefer to make it configurable to allow high priority traffic. T-mobile thinks that an emergency call should be handled and not allowing SR for such calls is not acceptable.

- CATT has a suggestion to allow RA access as a fall-back. AT&T highlights that we have regulatory requirements that we have to meet and enable the calls.

- Lenovo thinks that everyone agrees that emergency calls are important so the question is do we give the tools to the network to enable faster access or is the initial delay acceptable.

- Ericsson thinks too that we have the random access and that goes quite far and for the NW you can exit the NES call once you get the request.

- InterDigital explains that we agreed if we have SR we keep it pending and don’t trigger RA and the question is how long is the period expected to last. Qualcomm agrees, we disabled the RACH and if we make the RACH fallback configurable we might as well make SR configurable.

- Qualcomm explains that to use the RACH we need a new trigger.

- Vodafone would like to ensure that the follow-up actions from network have to ensure that the quality of the emergency call is not degraded.

=> offline to discuss mechanisms to enable emergency calls and the action from the network.

[R2-2304692](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304692.zip) Discussion on Cell DTX/DRX configuration and operation Xiaomi discussion Rel-18

[R2-2305082](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305082.zip) Discussion on key open issues of Cell DTX / DRX Apple discussion Rel-18 Netw\_Energy\_NR-Core

**PDCCH monitoring for retx**

[R2-2305321](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305321.zip) Further discussion on cell DTX and DRX ZTE corporation, Sanechips discussion Rel-18 Netw\_Energy\_NR-Core

*Proposal 1: UE monitors PDCCH for RAR during Cell DTX non-active time. The ra-ResponseWindow could be started as legacy.*

*Proposal 2: UE monitors PDCCH for msg4 during Cell DTX non-active time. The ra-ContentionResolutionTimer could be started as legacy.*

*Proposal 4: UE doesn’t monitor PDCCH for retransmission during Cell DTX non-active time. The drx-RetransmissionTimer DL(UL) could be stopped during Cell DTX non-active time.*

[R2-2305651](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305651.zip) Remaining issues on DTX/DRX Nokia, Nokia Shanghai Bell discussion Rel-18 Netw\_Energy\_NR-Core

*Proposal 3: retransmission can be scheduled in case it falls out of the Cell DTX active period, i.e., when the DRX retransmission timer is running, the UE should monitor PDCCH regardless of the Cell DTX.*

Discussion:

- Lenovo thinks that not continuing with the retransmission is acceptable.

- CATT thinks we should make thinks simple and we shouldn’t touch C-DRX at all and it belongs to gNB to ensure that it doesn’t schedule during non-active periods. The fraction of time the UE is on active time is a very short period of time and we should not optimize just for this.

- Apple thinks that this is linked to the high priority traffic discussion. If we allow high priority traffic we should proceed with Nokia proposal.

- Ericsson thinks the network should be able to retransmit and the UE monitor PDCCH as per normal C-DRX.

- Huawei supports ZTE’s proposal to keep it simple.

- Qualcomm agrees Nokia even though we might making some exceptions. Interdigital agrees and we should keep C-DRX as is. Vodafone thinks we should ensure retx should be handle active period and we are taking about background traffic. What is the problem if we wait for the retx.

- CMCC thinks that it should be allowed as it is only a small fraction of the time.

- LG, Samsung and Oppo think that we shouldn’t monitor the PDCCH for the retx.

- Xiaomi retx wonders if it is for emergency calls or others.

- Mediatek has the same understanding as Nokia.

- NEC thinks that the network should be able to configure the retransmission and maybe an activity timer can be considered.

- Sony thinks that there is no need to optimize and would like to go with Nokia approach. ETRI supports the Nokia proposal

- BT thinks we should clarify whether it is ok to wait for the a bit and which types of traffic we are talking about.

Agreements:

1 UE monitors PDCCH for RAR during Cell DTX non-active time. The ra-ResponseWindow could be started as legacy.

2 UE monitors PDCCH for msg4 during Cell DTX non-active time. The ra-ContentionResolutionTimer could be started as legacy.

3 Working assumption: When the retransmission timer is running (if C-DRX is configured), the UE is expected to monitor PDCCH, like in legacy. It is up to the network whether it schedules retransmissions out of the Cell DTX active period, i.e., when the DRX retransmission timer is running, the UE should monitor PDCCH regardless of the Cell DTX.

**Scheduled DG PUSCH/PDSCH during cell DRX/DTX non-active periods:**

[R2-2306044](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306044.zip) Discussion on DTX/DRX mechanism LG Electronics Inc. discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 5. It is up to gNB implementation how to avoid scheduling of PDSCH reception/PUSCH transmission occurring during non-active period of cell DTX/DRX.

[R2-2305120](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305120.zip) Cell DTX-DRX Mechanism Qualcomm Incorporated discussion Rel-18

Proposal 8: When an UL grant (PUCCH/PUSCH)/DL assignment (PDCCH/PDSCH) is scheduled by the gNB during cell DRX/DTX, respectively, the UE follows the grant assignment. No spec. impact for cell DTX/DRX, i.e., no implicit PHY cancellation at the UE.

[R2-2305925](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305925.zip) Cell DTX/DRX mechanism InterDigital discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 8: The UE can stop drx-inactivity timer during the cell DTX non-active period if there are no pending retransmissions on any HARQ process.

**Multiple Configuration**

[R2-2305840](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305840.zip) Further aspects on cell DTX/DRX Ericsson discussion

Proposal 2 The UE can be provided with at least two Cell DTX/DRX configurations. Only one configuration is active at a time.

[R2-2306222](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306222.zip) Cell DTX/DRX NES Techniques III discussion

Proposal 2: Multiple Cell DTX/DRX configurations should be included in further discussion.

**C-DRX and Cell DTX alignment**

[R2-2305840](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305840.zip) Further aspects on cell DTX/DRX Ericsson discussion

Proposal 3 A functional coexistence of UE C-DRX and Cell DTX can be ensured by the NW through the appropriate UE C-DRX and Cell DTX configurations, and by specifying the UE behaviour in cases when UE C-DRX active periods occur during Cell DTX non-active periods.

[R2-2305651](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305651.zip) Remaining issues on DTX/DRX Nokia, Nokia Shanghai Bell discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 1: alignment of UE’s C-DRX and NW cell DTX is up to NW implementation.

[R2-2305389](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305389.zip) Discussion on cell DTX and DRX Huawei, HiSilicon discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 2: RAN2 discuss and define the related timers of cell DTX/DRX, e.g. celldtx-onDurationTimer and celldrx-onDurationTimer. The start timer formula of the onDurationTimer from UE C-DRX can be reused, i.e. “[(SFN \* 10) + subframe number] modulo (cell DTX/DRX Cycle) = celldtx/celldrx StartOffset”

[R2-2305870](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305870.zip) Alignment between Cell DTX/DRX and C-DRX CATT, Turkcell discussion Rel-18 FS\_Netw\_Energy\_NR

Proposal 1: The Cell DTX/DRX active period can be extended on a UE basis, to follow the UE’s C-DRX Active Time (e.g., extended due to UE activity or ReTx).

Proposal 2: UEs which C-DRX on-duration starts earlier than the Cell DTX/DRX on-duration implicitly use the start-offset of Cell DTX/DRX as the (new) start-offset for their C-DRX after Cell DTX/DRX activation.

**DTX-DRX alignement**

[R2-2305120](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305120.zip) Cell DTX-DRX Mechanism Qualcomm Incorporated discussion Rel-18

Proposal 1: Cell DRX is configured as part of Cell DTX configuration and must be, if configured, fully aligned with Cell DTX, i.e., Cell DRX and Cell DTX are both either active or non-active at a time.

**HARQ feedback**

[R2-2305013](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305013.zip) Remaining issues for Cell DTX\_DRX Samsung Electronics Co., Ltd discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 2: RAN2 to discuss whether UE transmits HARQ feedback or not if the HARQ feedback occasion overlaps with non active period of Cell DRX.

Proposal 3: if HARQ feedback is not transmitted when HARQ feedback occasion overlaps with non active period of Cell DRX, UE start drx-HARQ-RTT-TimerDL in first symbol after the end of HARQ feedback occasion.

**Activation/deactivation**

[R2-2306403](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306403.zip) Discussion on cell DTX/DRX mechanisms - configuration and behaviour BT plc, KDDI discussion Rel-18

Proposal 1 RAN2 to modify current implicit cell DTX/DRX activation/deactivation baseline to explicit configuration

Proposal 2 If explicit cell DTX/DRX configuration is agreed, RAN2 to discuss how cell DTX/DRX explicit activation/deactivation is performed to avoid/mitigate signalling failures and call drops

[R2-2306407](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306407.zip) Cell DTX and DRX Enhancements Fraunhofer IIS, Fraunhofer HHI discussion Rel-18

Proposal 1: RAN2 continues to discuss and evaluate dynamic signaling benefits, especially in light of the latest agreements.

Proposal 2: Cell DTX/DRX supports L1 activation / de-activation. FFS L2 signaling

Proposal 3: L1/L2 activation of Cell DTX/DRX supports common (group) activation

Proposal 4: L1/L2 de-activation of Cell DTX/DRX supports both UE specific and common (group) de-activation

**Other RA and paging**

[R2-2305529](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305529.zip) Discussion on DTX/DRX mechanism OPPO discussion Rel-18 Netw\_Energy\_NR

Proposal 7 RAN2 confirms no impact on RACH, paging and SIBs for both legacy UEs and Rel-18 non-NES capable UEs in the CONNECTED mode.

Proposal 8 RAN2 confirms no impact on paging for Rel-18 NES capable UEs in the CONNECTED mode.

[R2-2305321](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305321.zip) Further discussion on cell DTX and DRX ZTE corporation, Sanechips discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 1: UE monitors PDCCH for RAR during Cell DTX non-active time. The ra-ResponseWindow could be started as legacy.

Proposal 2: UE monitors PDCCH for msg4 during Cell DTX non-active time. The ra-ContentionResolutionTimer could be started as legacy.

[R2-2305853](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305853.zip) DL considerations for cell DTX/DRX NEC Telecom MODUS Ltd. discussion

[R2-2305855](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305855.zip) UL considerations for Cell DTX/DRX NEC Telecom MODUS Ltd. discussion

[R2-2305941](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305941.zip) Various alignment aspects Lenovo discussion Netw\_Energy\_NR-Core

[R2-2306074](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306074.zip) Considerations on Cell DTX/DRX KDDI Corporation discussion

[R2-2306500](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306500.zip) Reminding issues on stage 2 of the Cell DTX/DRX MediaTek Inc. discussion Rel-18 Netw\_Energy\_NR-Core

### 7.3.3 SSB-less Scell operation

Contributions on inter-band CA for FR1 and co-located cells

[R2-2305083](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305083.zip) Discussion on RAN2 work of inter-band SSB-less CA Apple discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 1: If RAN4 conclude SSB-less SCell for inter-band CA for FR1 and co-located cells is feasible, the signaling of intra-band CA (including RRC change on timing of SSB-less SCell and capability signaling) can be considered as its baseline. Whether other new signaling is required depends on RAN4 input.

Proposal 2: Before RAN4 provide sufficient input, RAN2 do not start discussion on enhancement of L1/ L3 measurement and SCell activation procedures.

[R2-2305775](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305775.zip) Discussion on SSB-less SCell operation CMCC discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 1: RAN2 needs to wait for further RAN4 progress on the scenario feasibility of the inter-band SSB-less SCell requirements.

Proposal 2: If RAN4 concludes it is feasible, RAN2 can further work on the following specification impacts:

- RRC configuration of the frequency of the SSB to be used for the UE to obtain the timing reference for the inter-band SCell.

- UE capability reporting to indicate whether UE supports configuration of inter-band SCell that does not transmit SS/PBCH block.

- Potential impact on beam management, radio link monitor, RRM measurement.

[R2-2304694](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304694.zip) Discussion on inter-band SSB-less Scell Xiaomi discussion Rel-18

[R2-2304862](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304862.zip) Enhancements of SBB/SIB-less NES solutions Dell Technologies discussion Rel-18

[R2-2305250](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305250.zip) Discussion on SSB/SIB-less Solutions for NES Samsung discussion Rel-18

[R2-2305320](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305320.zip) Discussion on SSB-less SCell operation for NES ZTE corporation, Sanechips discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305336](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305336.zip) RAN2 impact on supporting inter-band SSB-less Scell operation vivo discussion Rel-18

[R2-2305721](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305721.zip) Discuss on SSB-less SCell operation in NES Lenovo discussion Rel-18

[R2-2305841](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305841.zip) SSB-less Scell operation on inter-band CA for FR1 Ericsson discussion

[R2-2305907](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305907.zip) On NES SSB-less SCell operation Nokia, Nokia Shanghai Bell discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305928](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305928.zip) SSB-less Scell operation InterDigital discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2306068](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306068.zip) Discussion on SSB-less SCell operation Huawei, HiSilicon discussion Rel-18 Netw\_Energy\_NR

### 7.3.4 Cell selection/re-selection

Contributions mechanisms to prevent legacy UEs camping on cells adopting the Rel-18 NES mode

[R2-2306406](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306406.zip) Identify NES capable UEs by network BT plc discussion Rel-18

Proposal 2 RAN2 to agree that UE reports to network its NES capabilities, i.e., cell DTX/DRX UE capabilities, during UE capabilities exchange process

Proposal 3 RAN2 to discuss if a new barring mechanism to bar non-NES capable UEs is specified in Rel-18 based on pros and cons

[R2-2305121](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305121.zip) Barring legacy UEs for NES Cells Qualcomm Incorporated, T-Mobile US discussion Rel-18

Proposal 1: A Solution to introduce legacy UEs from camping on a cell applying cell DTX/DRX is not pursued in Rel-18. It is up to NW to align legacy UEs to cell DTX/DRX cycles or offloading them to another cell in case of overlapping coverage.

[R2-2305390](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305390.zip) Discussion on cell selection/reselection for NES Huawei, HiSilicon discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 1: Separate camping restrictions for NES-capable and non-NES UEs are needed for ensuring NW NES gains. Which NES technique(s) apply to the new restrictions is left up to NW implementation and can be revisited once the details of NES techniques are specified.

Proposal 2: Introduce a new cellBarred-NES IE to enable separate barring of legacy and NES UEs.

Proposal 3: Introduce new IntraFreqExcludedCellList-NES / InterFreqExcludedCellList-NES IEs enable proper reselection behaviour of legacy and NES UEs.

[R2-2305530](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305530.zip) Discussion on cell selection reselection OPPO discussion Rel-18 Netw\_Energy\_NR

Proposal 1 If needed, cellBarred in MIB is used to block the legacy UE from accessing an NES cell.

Proposal 2 RAN2 introduces a new barring indication in SIB1 to control the NES-capable UEs accessing an NES cell. In detail, once cellBarred in MIB is indicated as Barred, the NES-capable UEs need to further check the new barring indication in SIB1.

Proposal 3 RAN2 confirms a unified control of all NES-capable UEs accessing a certain NES cell, i.e. all NES-capable UEs are uniformly blocked or allowed to access a cell.

[R2-2304691](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304691.zip) Discussion on UE access control in NES cell Xiaomi discussion Rel-18

[R2-2305251](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305251.zip) Discussion on Cell Selection and Reselection for NES Samsung discussion Rel-18

[R2-2305323](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305323.zip) Consideration on preventing legacy UEs camping on NES cell ZTE corporation, Sanechips discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305337](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305337.zip) Discussion on cell selection/re-selection vivo discussion Rel-18

[R2-2305455](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305455.zip) Definition of NES and barring on cell DTX/DRX cells Vodafone discussion Rel-18

[R2-2305718](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305718.zip) Cell selection/re-selection in NES Lenovo discussion Rel-18

[R2-2305776](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305776.zip) Discussion on cell barring and reselection for NES CMCC discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305842](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305842.zip) NES Cell selection/reselection Ericsson discussion

[R2-2305858](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305858.zip) Procedure for legacy UEs camping on NES cells NEC Telecom MODUS Ltd. discussion [R2-2301522](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2301522.zip)

[R2-2305871](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305871.zip) Consideration on Cell Selection/Re-selection on NES cells CATT, Turkcell discussion Rel-18 FS\_Netw\_Energy\_NR

[R2-2305892](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305892.zip) Cell Reselection Enhancements Supporting NES Google Inc. discussion

[R2-2305926](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305926.zip) Cell selection and resection for NES InterDigital discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305974](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305974.zip) Legacy UE Handling for NES ETRI discussion [R2-2301463](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2301463.zip)

[R2-2306059](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306059.zip) Considerations on Cell selection/re-selection KDDI Corporation discussion

[R2-2306276](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306276.zip) Access control enhancement for NES LG Electronics France discussion Netw\_Energy\_NR-Core

=> Revised in [R2-2306538](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306538.zip)

[R2-2306538](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306538.zip) Access control enhancement for NES LG Electronics France discussion Netw\_Energy\_NR-Core

[R2-2306329](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306329.zip) Discussion on Cell selection NTT DOCOMO INC. discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2306361](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306361.zip) Reselection and Paging handling for NES Nokia, Nokia Shanghai Bell discussion Rel-18 FS\_Netw\_Energy\_NR

[R2-2306410](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306410.zip) Cell Selection and Re-Selection for NES Fraunhofer IIS, Fraunhofer HHI discussion Rel-18

### 7.3.5 Connected mode mobility

Contributions on CHO procedure enhancement(s) in case source/target cell is in NES mode

[R2-2305122](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305122.zip) NES Connected mode mobility Qualcomm Incorporated discussion Rel-18

*Proposal 4: As a baseline, NES CHO comprises a change in existing CHO configuration conditions to make it harder for UEs to connect or stay connected to a cell in NES mode.*

*Proposal 5: RAN2 to discuss whether the RRC CHO configuration can be enhanced to include multiple offsets to account for source/target cell being in Normal or NES mode.*

*Proposal 6: RAN2 to discuss how an L2 “NES trigger” can modify CHO thresholds among the following two baseline options:*

*• Option 1: NES CHO trigger informs UE of NES mode of source and target cell(s), UE changes the conditions for CHO according to a pre-configuration of mode dependent A3-A5 offsets.*

*• Option 2: NES CHO trigger directly instructs UE to change the condition of an existing CHO configuration.*

- Huawei wants to ensure that we are addressing the same requirements, in DRX we are addressing high QoS cases.

- Vodafone as if switching cells off is considered here. Qualcomm explains that first you want the UEs to exist the cell and you can switch off the cell.

- Apple asks if cell means source or target cell. Qualcom explains that it is both. CATT asks how the UE know know that the target cell has changed.

[R2-2305942](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305942.zip) CHO Procedure in NES Mode Lenovo discussion Netw\_Energy\_NR-Core

*Proposal 1: If relaxed measurements are configured (and subsequently handover condition is met), UE starts handover execution only when the source cell is about to get into Cell DRX/ DTX sleep.*

- Vodafone asks what is the relaxed measurement.

*Proposal 2: The time when the source cell starts (or about to start) Cell DRX/ DTX sleep can be determined by the UE based on the received start offset of Cell DTX/ DRX configuration received in UE dedicated RRC signalling.*

*Proposal 3: L1 based signaling to activate/ deactivate NES mode for executing conditional handover is not considered.*

[R2-2306362](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306362.zip) CHO on NES Nokia, Nokia Shanghai Bell discussion Rel-18 FS\_Netw\_Energy\_NR

*Proposal 1: Add for events A3, A4 and A5 a additional parameter that indicates that event is triggered only if “NES trigger” is active for the source cell.*

- Nokia explains that you configure a NES A4 specific event.

*Proposal 2: “The NES trigger” would be at least for the use case of turning off the cell (whether other triggers are enabled is FFS and need to wait that WI progresses on other aspects of the WI).*

Discussion on CHO threshold configuration or event configuration

- Samsung thinks that we use configure existing events with NES triggers. Apple explains that with existing framework that the same event is configured with different threshold.

- Google thinks that event A4 is the best even to use and even then A4 is only applicable to NTN scenario. CATT agrees with google and we should be able to use A4 for TN as well and this allows the UE to chose the next best cell without considering the source cell. Apple thinks A4 alone is not sufficient as we need to handle the case where the UE can trigger the even before A4. Interdigital also considers A4 a good contition but it should be linked with a time or window similar to NTN.

- Oppo thinks we can have different threshold for an event whether NES is configured or not. Xiaomi thinks that we should talk about the time point of triggering NES.

- Vodafone explains that we have two cases, we switch off the cell and you don’t care about thresholds/configurations. The other case when you want to keep some of the devices.

- Lenovo thinks that we should give the option to the network to configure A3,A4,A5. We can have two conditions. Oppo thinks that Vodafone comments on cell off is very important.

- CATT asks how the UE know the cell is in NES. Lenovo assumes that the UE can use CELL\_DTX/DRX configuration so the UE know when it will start sleeping.

- ZTE is not sure why we would need two CHO execution condition.

- LG asks how two different CHO execution condition would be achieved, one event and two thresholds or two events.

- Mediatek asks if the assumption is that NES mode is for time domain only then the UE knows.

[R2-2305511](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305511.zip) Handover enhancement for NES Sony discussion Rel-18 FS\_Netw\_Energy\_NR

*Proposal 1: Network should notify the UE to start performing NES CHO execution when the NES mode of source or candidate cells is going to change or has changed.*

*Proposal 2: The NES CHO execution trigger is based on L1 signaling.*

- Lenovo asks why the network wouldn’t send the message when it has decided to switch off.

- Samsung clarifies that RAN1 agreed on L1 signaling and they would also like to have L2 signaling. Samsung asks whether the intention is to use the RAN1 signalling for activation/deactivation that RAN1 agreed. Sony explains that it would be a new signaling for CHO.

- Nokia asks if this should be evaluation instead of being execution. Sony explains that it is execution. Qualcomm doesn’t like L1 stuff as L1 is not involved and what happens if the network would like to enable DTX but not handover the UEs. Lenovo explains that the LS from RAN1 is related to deactivation/activation.

[R2-2304693](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304693.zip) Discussion on UE mobility due to NES cell Xiaomi discussion Rel-18

Proposal 4: The condEventT1 introduced in R17 for NTN is reused for time-based CHO in NES, the duration IE can be ignored or set to 1.

[R2-2305890](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305890.zip) CHO Enhancements Supporting NES Google Inc. discussion

Proposal 1 CondEventA4 can be configured as a CHO execution condition in the NES scenario.

- Lenovo thinks that the eventT1 is a condition on when the gNB is entering NES mode which is part of the second agreement FFS. Apple thinks this should be for further study as it add a new requirement and NES UE shouldn’t use the UTC time. Oppo thikns that the time based information can be added to the CHO configuration. The current event T1 can be modified and we should just consider the start time.

- CATT supports google proposal to be able use event A4 as it considers only the quality of neighboring cell. CMCC also supports A4 event plus timer based. Qualcomm indicates that the timer is useful to avoid RACH storming but there is not reason to really delay the evaluation.

- Vodafone doesn’t thinks A4 is needed but timer based would be good. CATT thinks that one strategy is to set the threshold very low but that increases the risk of failure. Verizon thinks that the operators would find the timer based more useful but in any case the operator should be given the option to configure the events it finds most useful.

**Agreements**

1. We will have a CHO solution that considers NES mode of at least source cell.

2. We can have a specific NES CHO execution condition based on source cell NES mode. FFS how the UE determines is in NES mode. FFS on how this is achieved in RRC

3. We will not introduce new L1 signalling for the purpose of CHO

4. Event A3, A4, A5 can be configured as a CHO execution condition in the NES scenario. We will study the time based mechanism

[R2-2305252](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305252.zip) Discussion on Connected mode mobility for NES Samsung discussion Rel-18

Proposal 1. RAN2 needs to discuss and determine the conditions in a CHO configuration, which could be one or more than one of conditions of : A3, A4, A5, and a new condition of “NES activation signal reception”

[R2-2305461](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305461.zip) Triggering conditions and other aspects of the Handover to/from DTX/DRX cells Vodafone GmbH discussion Rel-18

Proposal 1: For the case the “Source Cell is going to switch off” no new CHO evaluation conditions associated with the cell going to be switched off are needed.

Proposal 2: To trigger the CHO in case of Source Cell is going to be switched off, broadcast signalling is used

Proposal 3: To trigger the CHO in case of Source Cell is going to be switched off, RRC signalling is used

Proposal 4: It is proposed to discuss if additional timer is needed to facilitate the UEs in case Source Cell is going to switch off.

**Target cell NES state**

[R2-2306052](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306052.zip) Discussion on CHO enhancements for NES Sharp discussion

Proposal 4: If the network knows the mode of a target cell, the network can indicate the mode of the target cell to the UE by explicit indication

Proposal 5: If the network can anticipate when a target cell will switch to NES mode or return to normal mode, a time based conditional handover event can be introduced to implicitly indicate the mode switching of target cell.

[R2-2305206](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305206.zip) Discussion on Connected mode mobility for network energy savings Fujitsu discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 5: RAN2 to confirm the UE does not have to obtain the NES mode of the cell from the target cell.

Proposal 6: The priority information is additionally provided by the source cell to select a suitable target cell.

Proposal 7: The UE selects the CHO candidate cell indicated as a high priority

[R2-2305338](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305338.zip) Conditional handover enhancement for network energy saving vivo discussion Rel-18

Proposal 6: The NES mode/priority/NES capability of candidate cells are configured by the network, and it is up to the UE which one to select based on the NES mode and the signal quality of the candidate cells.

[R2-2306362](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306362.zip) CHO on NES Nokia, Nokia Shanghai Bell discussion Rel-18 FS\_Netw\_Energy\_NR

Proposal 4: It can be left up to UE implementation to select target cell out of multiple candidate CHO cells

[R2-2305872](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305872.zip) CHO enhancement for NES CATT, Turkcell discussion Rel-18 FS\_Netw\_Energy\_NR

Proposal 3 It is up to NW implementation whether to set a NES cell as a candidate cell. No specification change is needed.

[R2-2305864](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305864.zip) CHO procedure enhancement to support NES mode NEC Telecom MODUS Ltd. Discussion

Proposal-1: RAN2 send LS to RAN3 to enhance the signalling between the two gNBs to support NES mode notification between neighbour gNBs.

Proposal-2: Network implementation should be allowed for source cell to not select a target cell in NES mode as CHO candidate cell for the UE.

Proposal-3: The target cell’s NES mode should be indicated as part of the target cell’s CHO configuration to the UE during CHO preparation.

Proposal-4: The detailed configurations of target cell’s NES operation should be informed to the source cell and then to the UE during CHO preparation.

Proposal-5: Legacy CHO configuration update procedure is used to notify the UE the change of NES mode of the CHO candidate cell.

**Failure handling**

[R2-2305860](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305860.zip) CHO for NES Ericsson discussion Rel-18 Netw\_Energy\_NR-Core

Proposal 2 Network needs to know if there are no good enough candidate target cells for CHO at the time cell is going to deactivate or enter cell DTX/DRX.

Proposal 3 Enhance CHO procedure to enable priorization of candidate target cells by the UE based on NES mode.

[R2-2305872](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305872.zip) CHO enhancement for NES CATT, Turkcell discussion Rel-18 FS\_Netw\_Energy\_NR

Proposal 3 It is up to NW implementation whether to set a NES cell as a candidate cell. No specification change is needed.

Proposal 4: Considering the rare cases of HO failures, legacy connection re-establishment is an appropriate way to handle the case when HO fails and the source cell is about to enter NES mode

[R2-2305084](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305084.zip) Discussion on CHO enhancement in NES Apple discussion Rel-18 Netw\_Energy\_NR-Core

if multiple CHO candidate cells fulfill the condition and the priority information is provided.

Proposal 3: If no triggered cell is available by the time source cell entering "NES mode", the UE re-evaluates candidate target cells with a delayed CondEvent Ax, which may be a CondEvent A3/A5 with a looser threshold or a CondEvent A4 which only evaluates radio condition of neighbor cell.

[R2-2305322](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305322.zip) Further discussion on connected mode mobility ZTE corporation, Sanechips discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305531](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305531.zip) Discussion on connected mode mobility OPPO discussion Rel-18 Netw\_Energy\_NR

[R2-2305629](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305629.zip) Discussion on Connected mode mobility CMCC discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2305927](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305927.zip) NES mobility aspects InterDigital discussion Rel-18 Netw\_Energy\_NR-Core

[R2-2306069](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306069.zip) Discussion on CHO enhancement for NES Huawei, HiSilicon discussion Rel-18 Netw\_Energy\_NR

[R2-2306240](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306240.zip) Mobility enhancement: mobility triggering by light handover command LG Electronics Inc. discussion Rel-18 Netw\_Energy\_NR-Core

### 7.3.6 Others

This will be downprioritized

[R2-2305123](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305123.zip) Discussion of RAN3 LS on Restricting Paging Qualcomm Incorporated discussion Rel-18

[R2-2305512](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305512.zip) Skip monitoring of CSI-RS during non-active periods Sony discussion Rel-18 FS\_Netw\_Energy\_NR

## 7.8 NR support for UAV

(NR\_UAV -Core; leading WG: RAN2; REL-18; WID: RP-223545)

Time budget: 1 TU

Tdoc Limitation: 4

### 7.8.1 Organizational

*Stage 2 running CR expected as input to this meeting*

[R2-2305885](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305885.zip) Uncrewed Aerial Vehicles in Rel-18 - Updated Workplan Nokia, Nokia Shanghai Bell Work Plan Rel-18 NR\_UAV-Core

=> Noted

[R2-2305886](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305886.zip) Stage-2 Text Proposal for Rel-18 UAVs Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_UAV-Core

=> The CR is endorsed and will be updated after this meeting

### 7.8.2 Measurement reporting for mobility and interference control

Contributions should focus on further details related enhancement to measurement reports taking into account agreements made in RAN2#121bis-e

**Height dependent configurations:**

SSB-ToMeasure:

[R2-2305056](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305056.zip) Measurement and reporting enhancements Qualcomm Incorporated discussion Rel-18 NR\_UAV-Core

*Proposal 1. Add height-based list of SSB-ToMeasure with corresponding height ranges and hysteresis in MeasObjectNR (TP shown above can be taken as baseline).*

- Xiaomi is asking how many height ranges should be configured. Qualcomm thinks that more than 2 should be possible.

- Nokia asks if we can also configure other measurements, like number of triggered cells.

[R2-2306491](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306491.zip) Height-dependent measurement configuration ZTE Corporation, Sanechips discussion Rel-18 NR\_UAV-Core

*Proposal 2: The only impact on L3 measurement is to capture in the SSB-ToMeasure field description that the UE applies the SSB-ToMeasure when it is in associated height-region.*

- LG thinks that we need to specify some timers. Xiaomi thinks that using a similar procedure as RRC reconfiguration maybe better. Vivo agrees with Xiaomi and it is more aligned with the motivation of introducing such feature.

*Proposal 3: As a basic principle, if no height-specific SSB-ToMeasure is configured for a specific height region, the legacy SSB-ToMeasure is applied.*

- LG and Qualcomm are good with this proposal. Samsung thinks that we should have the option for the network to not measure any SSB so it should be controlled by the network. Nokia thinks that if it is not configured the UE can either measure SSB-to measure without height spefic configuration or measure on all SSBs.

[R2-2305868](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305868.zip) UAV measurement reports Ericsson discussion Rel-18 NR\_UAV-Core

*Proposal 5: For UE behavior on L1 and L3 measurement, RAN2 to discuss, for example, whether to keep/discard the old samples while UE moves to a new height region with a different SSB-ToMeasure value*

- Ericsson thinks that this should be left up to UE implementation. Qualcomm agrees.

- Samsung thinks that the UE should discard old samples. Qualcomm explains that there may be cases where you have the same SSBs across boundaries so the UE shouldn’t discard in this case.

- CMCC and ZTE agrees that it can be left to UE implementation

*Numberoftriggeringcells:*

[R2-2305600](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305600.zip) Discussion on Measurement Reporting for NR UAV CMCC discussion Rel-18 NR\_UAV-Core

*Proposal 4: It is proposed to configure different numberoftriggeringcells value correspond to different height ranges, for example, height range 1 for NumberOfTriggeringCells value 1, height range 2 for NumberOfTriggeringCells value 2, and so on, and a step for height range could also be discussed.*

- Nokia asks if this is in the report config and how does this enable the event A4. Qualcomm clarifies that this is for the measurement report config unlike SSB-tomeasure

-

[R2-2306215](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306215.zip) Measurement report enhancement for UAV Huawei, HiSilicon discussion Rel-18 NR\_UAV-Core

Proposal 6: The UE should maintain the measured cells in cellTriggeredList when a new numberOfTriggeringCells is applied due to the UE reaching a new height range.

**Agreements**

1. Add height-based list of SSB-ToMeasure with corresponding height ranges and hysteresis in MeasObjectNR. FFS on the number of height ranges
2. As a basic principle, if no height-specific SSB-ToMeasure is configured for a specific height region, the legacy behaviour applies.
3. For UE behavior on L1 and L3 measurement, it is left to UE implementation whether to keep/discard the old samples while UE moves to a new height region with a different SSB-ToMeasure value

A4-threshold:

[R2-2306135](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306135.zip) Discussion on measurement reporting for NR UAV Xiaomi discussion Rel-18 NR\_UAV-Core

Proposal 10: Height-dependent configuration of MR configuration parameters is supported using combination of events H1/H2 with other events (i.e event Ax).

[R2-2305691](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305691.zip) Discussion on height dependent measurement for NR UAV Lenovo discussion Rel-18

Proposal 2: Specify different A4 threshold values for different height region in measurement configuration, instead of combination of events

*Discussion on numberoftriggering cells and A4*

Configure different numberoftriggeringcells value corresponding to different height ranges. This configuration can be in the report config

- Nokia thinks that event combination would require the UE to send extra data and H1/H2 are triggered when the thresholds are met and that’s it. If it is a trigger it will happen only one for the A4 event so H1/H2 is not appropriate to implement this.

- LG supports combination of events.

- Samsung doesn’t support combination as with H1 and H2 we cannot specify a height region with upper and lower bound.

- ZTE is generally fine with combination and there is a way to implement it to have a height range dependent configuration.

- Vivo supports to have a unified solution for MR and MO and for combination of events there are more issues to address.

- Ericsson thinks the combination can work and doesn’t see the advantage of having multiple ranges.

- Huawei thinks both can work but the modeling of Lenovo is better, as it implements a height dependent threshold.

- Ericsson asks if there is a technical reason why we want a unified solution. Vivo explains that this better for the specification.

=> continue over offline [CB 304]

General Heigh-dependent aspects:

[R2-2305429](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305429.zip) Discussion on measurement reporting enhancement for NR UAV vivo

Proposal 4: ToAddModList / ToRemoveList structure is used for configuring the height-dependent parameter, in which the height specific parameter is linked with the related height region by one entry.

[R2-2306046](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306046.zip) Remaining issues on measurement reporting enhancements in NR UAV Samsung Electronics Austria discussion Rel-18 NR\_UAV-Core

*Proposal 8: RAN2 to discuss the number of height regions we should consider for height-dependent configurations, e.g., one, two, or more than two.*

*Proposal 10: RAN2 to discuss how to avoid applying a height-specific value back and forth constantly caused by ping-poing effect.*

- Samsung proposes some timer. Qualcomm explains that we have the hysteresis. Interdigital agrees that hysteris works but we only agreed to the SSBstomeasure. Samsung doesn’t thinks this is enough. Vodafone thought that they don’t change their heights very randomly it is predictable and hysteresis is sufficient.

- Spirant explains that there is some anomaly within a height and the pilot is controlling the flight that can vary with the wind.

**Height/location reporting**

[R2-2306046](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306046.zip) Remaining issues on measurement reporting enhancements in NR UAV Samsung Electronics Austria discussion Rel-18 NR\_UAV-Core

Proposal 1: When event H1 or H2 triggers, UE includes its height in the measurement report.

Proposal 2: As in LTE, define the separate field (e.g. heightUE) to indicate UAV UE's height in the IE MeasResults for event H1 and H2.

Proposal 3: When event H1 or event H2 triggers, location information (e.g. the IE CommonLocationInfo) is included in the measurement report as in legacy. No specification change is needed.

[R2-2305056](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305056.zip) Measurement and reporting enhancements Qualcomm Incorporated discussion Rel-18 NR\_UAV-Core

Proposal 3: UE height, location and/or velocity reporting without being accompanied by other RRM report is supported.

Proposal 4: Whether UE height is included when event H1 or H2 triggers is also configurable by the network.

Proposal 5: H1/H2 triggered UE height reporting using uncompensated barometric pressure measurement is supported. (Height reporting using an RRC field as in LTE is not introduced.)

**Combination of Hx and Ax events**

Combination of events

[R2-2305302](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305302.zip) Discussion on Measurement Reports Enhancements NEC Europe Ltd discussion Rel-18 LTE\_UAV\_enh-Core

Proposal 1: To minimize the impact on the current measurement report configuration and triggering structure, consider the following options to combine height-dependent conditions with RSRP/RSRQ/SINR-based conditions:

- Option 1: Link ONE report configuration to TWO measurement events.

- Option 2: Link ONE measurement ID to TWO report configurations.

When event is considered fulfilled:

[R2-2306053](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306053.zip) Discussion on measurement reporting for NR UAV Sharp discussion

Proposal 2: UE initiates measurement reporting procedure when entering condition of Ax event is fulfilled during Ax-timeToTrigger and entering condition of Hx event is fulfilled during Hx-timeToTrigger.

[R2-2305143](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305143.zip) On Height-dependent Measurement Report Configuration for UAVs Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_UAV-Core

[R2-2305144](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305144.zip) On Interference Reporting for UAVs Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_UAV-Core

[R2-2305429](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305429.zip) Discussion on measurement reporting enhancement for NR UAV vivo discussion Rel-18 NR\_UAV-Core

[R2-2306171](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306171.zip) Measurement reporting enhancement in UAV Apple discussion Rel-18 NR\_UAV

[R2-2306288](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306288.zip) Measurement Report Enhancement LG Electronics discussion Rel-18

[R2-2306337](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306337.zip) Measurement reporting enhancements for NR UAV China Telecom Corporation Ltd. discussion Revised

[R2-2306458](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306458.zip) Further discussion on NR support for UAV NTT DOCOMO, INC. discussion

[R2-2306490](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306490.zip) Measurement reporting enhancement in NR UAV ZTE Corporation, Sanechips discussion Rel-18 NR\_UAV-Core

[R2-2306529](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306529.zip) Measurement reporting for mobility and interference control China Telecom discussion [R2-2306337](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306337.zip)

### 7.8.3 Flight path reporting

*Contributions on enhancements to flight path reporting*

**Flightpath update notification**

[R2-2305887](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305887.zip) Further Details on Flight Path Plan (FPP) Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_UAV-Core

*Proposal 5: Study triggering of flightPathInfoAvailable in the UEAssistanceInformation based on time-based event trigger and distance-based event trigger. Consider the following options:*

*a) inform the network of a new FPP periodically (configurable periodicity).*

*b) inform the network of a new FPP if the timestamps for the included waypoints have changed more than a configurable threshold*

*c) inform the network of a new FPP if it deviates more than a configurable distance threshold from the currently available FPP*

*d) number of way points*

[R2-2305544](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305544.zip) UAV Flight Path Reporting Ericsson España S.A. discussion Rel-18

Proposal 1 Network configures a waypoint threshold with the understanding that a flight path update is triggered if more than the configured threshold of (e.g., number of) waypoints changes.

[R2-2306492](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306492.zip) On flight path reporting ZTE Corporation, Sanechips discussion Rel-18 NR\_UAV-Core

Proposal 1: To introduce prohibit timer instead of threshold in distance/time/number of waypoints to control triggering the flightpath update indication in UAI.

[R2-2306289](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306289.zip) Flight Path Information Report LG Electronics discussion Rel-18

Proposal 1. Do not specify triggering conditions for updated flightpath available indication, i.e., it is up to UE implementation to trigger.

Discussions

- Interdigital is ok with b) and c) but doesn’t see a point for periodic the network can just configure. Qualcomm thinks it can be left to UE implementation but if we specify something a) is not need.

- Samsung supports network configurable triggers but not sure about a) and b). b) may not be useful if for example the waypoints are not located within the coverage of the current gNB.

- LG doesn’t agree with triggering conditions, and it is up to UE implementation and a prohibit timer can work.

- Huawei doesn’t think prohibit timer as the network is preparing the handover along the path, but the network doesn’t care if it is in the seconds range, and more than 10minutes for example, so it has to be a meaningful change. The number of way points can be configurable even though 1 is sufficient.

- ZTE also thinks it can be up to UE implementation. CCMC thinks that initial flight report can be up to implementation but the followup update should be network controlled.

- Nokia reminds everyone we agreed it has to be network controlled. We can eliminate a) and we can eliminated prohibit timer for similar reasons.

- Qualcomm thinks prohibit timer is meaningless if the network has control over the UE reporting the update.

**Delta flightpath reporting**

[R2-2305109](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305109.zip) Delta reporting of flight path plan Qualcomm Incorporated discussion Rel-18 NR\_UAV-Core

*Proposal 1: Signalling of the changes in flight path information by the UE (‘delta’ signalling) is supported.*

*Proposal 2: Add a Way Point ID to identify a particular waypoint in the UE-reported flight path.*

*Proposal 3: Use xxToAddModList and xxToRemoveList to enable signalling of the changes in flight path.*

- Huawei indicates that this is not used currently in UL so there is a change when compared to legacy

*Case 1. Some outdated waypoints are removed as the UAV UE has already travelled through them.*

*Case 2. Some waypoints’ timestamp is updated but location remains the same.*

*Case 3. Some waypoints’ location (and possibly timestamp if it was indicated earlier) is updated due to change in planned path.*

*Case 4. Some new waypoint(s) is/are inserted due to change in planned path.*

[R2-2306216](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306216.zip) Discussion on flight path reporting Huawei, HiSilicon discussion Rel-18 NR\_UAV-Core

*Proposal 4: The delta report should be supported for flight path updates, especially partial flight path updates.*

*Proposal 5: Bitmap should be considered for the delta flight path report.*

*Proposal 6: For the delta flight path report, the flight path available indication does not need to be different if the bit map mechanism is supported.*

[R2-2305939](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305939.zip) Flightpath reporting for UAV InterDigital discussion Rel-18 NR\_UAV-Core

Proposal 1: Delta flightpath reporting is supported. As a baseline, UAV can report timestamp information only (i.e., a sequence of timestamps with size 1..maxWayPoint).

Proposal 2: FFS if delta reporting also supports updating individual waypoints/timestamps.

Proposal 3: NW decides whether UE reports full or delta flight path. FFS if delta flight path reporting is enabled by configuration or explicit request.

[R2-2305887](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305887.zip) Further Details on Flight Path Plan (FPP) Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_UAV-Core

Proposal 6: RAN2 does not pursue delta signaling for flight path reporting.

Proposal 7: Confirm that a single indication is used for both initial and updated flightpath plan.

*Discussion on whether we support delta signaling*

- Nokia, LG, ZTE, and Samsung still is not convinced this is useful. Delta signaling is not supported currently so it is introducing a new feature.

- Interdigital thinks that the delta configuration is not as scary as it sounds and there is a way to do it in a simple way (i.e. just time information) and you do have up 63% savings.

- Qualcomm thinks that it is not really delta it is just telling the network the changed timestamps.

- Huawei brings up an example, what if the UE has already done half of the path. So when it sends me somethings the network needs to understand where the UE is going next if it receives the whole path again.

**Agreements**

1. The network can configure the UE to trigger a flightpath update notification based on a configured delta time (when timestamp is configured to be reported) or distance configuration.

[R2-2305304](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305304.zip) Discussion on Flight Path Reporting NEC Europe Ltd discussion Rel-18 LTE\_UAV\_enh-Core [R2-2303105](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2303105.zip)

[R2-2305430](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305430.zip) discussion on Flight path reporting vivo discussion Rel-18 NR\_UAV-Core

[R2-2305601](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305601.zip) Discussion on Flight path Reporting CMCC discussion Rel-18 NR\_UAV-Core

[R2-2305692](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305692.zip) Remaining issues of flight path reporting for NR UAV Lenovo discussion Rel-18

[R2-2305938](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305938.zip) Flightpath update notification for UAV InterDigital discussion Rel-18 NR\_UAV-Core

[R2-2306054](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306054.zip) Discussion on flight path reporting for NR UAV Sharp discussion

[R2-2306124](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306124.zip) Discussion on triggering of flight path report ASUSTeK discussion Rel-18 NR\_UAV-Core

[R2-2306136](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306136.zip) Discussion on flight path reporting for NR UAV Xiaomi discussion Rel-18 NR\_UAV-Core

[R2-2306170](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306170.zip) Flight path reporting in UAV Apple discussion Rel-18 NR\_UAV

[R2-2306236](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306236.zip) Leftover Issue on Flight Path Reporting CATT discussion Rel-18 NR\_UAV-Core

[R2-2306241](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306241.zip) Consideration on flight path reporting for NR UAV DENSO CORPORATION discussion NR\_UAV-Core

[R2-2306338](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306338.zip) Flight path reporting enhancements for NR UAV China Telecom Corporation Ltd. discussion

[R2-2306449](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306449.zip) Discussion on flight path reporting Samsung discussion Rel-18 NR\_UAV-Core

### 7.8.4 Subscription-based aerial-UE identification

Contributions should focus on signaling required to support subscription-based aerial-UE identification

Note: Work done in LTE is a starting point for this objective. NR-specific enhancements can be considered, if needed, while overall the LTE and NR solutions should be harmonized as much as possible.

[R2-2305545](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305545.zip) Subscription-Based Aerial UEs Identification Ericsson España S.A discussion Rel-18 NR\_UAV-Core [R2-2302906](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2302906.zip)

*Proposal 3: RAN2 clarify the use of AUE subscription information and capture it in TS 38.300. Clause 23.17.2 in TS 36.300 V17.2.0 is used as a starting point.*

*Proposal 4: RAN2 discuss which are the key features to be specified as conditionally mandatory to the Aerial UE subscription towards end of Release 18.*

- Qualcomm thinks that we need more information than UAV or not like in LTE.

- Xiaomi thinks that we should first discuss and agree with the baseline.

- Samsung thinks that the LTE baseline enough.

- Nokia explains that RAN3 has agreed and this has been captured in the stage 2 CR. No need to define different UAV types.

**Agreement:**

1. The subscription-based aerial-UE identification adopted in LTE can be taken as the baseline for NR UAV (i.e. the RAN3 endorsed CR will be captured in stage 2) . No further NR specific enhancements will be pursued.

[R2-2305431](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305431.zip) discussion on Subscription-based aerial-UE identification vivo discussion Rel-18 NR\_UAV-Core

Proposal 1: The subscription-based aerial-UE identification adopted in LTE can be taken as the baseline for NR UAV.

[R2-2305602](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305602.zip) Subscription-based aerial-UE identification for NR UAV CMCC discussion Rel-18 NR\_UAV-Core

[R2-2306030](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306030.zip) Subscription-based Aerial-UE Identification in NR Qualcomm Incorporated discussion Rel-18 NR\_UAV-Core

*Proposal 1. From RAN2 point of view, it is beneficial for RAN to have the information about different UAV types, UAV subscription types, and/or UAV mission types.*

*Proposal 2. Inform RAN3 and SA2 of the RAN2 agreement.*

[R2-2306048](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306048.zip) Discussion on subscription-based aerial-UE identification for NR UAV Samsung Electronics Austria discussion Rel-18 NR\_UAV-Core

[R2-2306217](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306217.zip) Consideration on subscription-based UAV identification Huawei, HiSilicon discussion Rel-18 NR\_UAV-Core

[R2-2306424](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306424.zip) UAV Subscription and Identification Beijing Xiaomi Mobile Software discussion Rel-18 NR\_UAV-Core

### 7.8.5 UAV identification broadcast

UAV identification broadcast using PC5-U will be treated with higher priority. Contributions analysing the gap for supporting DAA using the same framework as BRID can be submitted.

**Separate SL resource pool for UAV**

[R2-2305110](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305110.zip) Remaining aspects of PC5-based BRID and DAA support Qualcomm Incorporated discussion Rel-18 NR\_UAV-Core, LTE\_UAV\_enh-Core

Proposal 2: Separate SL resource pool for BRID and DAA broadcast is supported.

[R2-2306218](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306218.zip) Discussion on UAV remote identification broadcast Huawei, HiSilicon discussion Rel-18 NR\_UAV-Core

Proposal 1: No separate resource pool is needed for A2X communication.

[R2-2305693](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305693.zip) Discussion on broadcasting remote id for UAV Lenovo discussion Rel-18

Proposal 1: Wait for SA2 reply to further discuss whether UAV specific resource pool is needed to support regional regulation and to fulfil U2X QoS requirements.

*Discussion*

- Vivo explains that the network can configure multiple resource pools and this can be considered furthered by SA2.

- Qualcomm explains that the reason is to enable the receiver to know whether the message is DAA or something else.

- Nokia has a similar understanding as Vivo and the network can make the decision that one is dedicated. Qualcomm explains that there is no service to resource pool mapping.

- Ericsson agrees that we need a separate resource pool and with mode 2 we need to ensure that these regulatory messages are not pre-empted.

- Xiaomi thinks that different frequencies will resolve this issue. Qualcomm explains that it doesn’t mean that there will be a dedicated frequency, each country will have their own regulation.

- Ericsson clarifies that it is not QoS but it is also about ensuring that the UE receives the messages without being pre-empted.

=> CB on Thursday pending SA2 discussion, but limited support for now

[R2-2305306](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305306.zip) Considerations on Enhancements for UAV identification broadcast NEC Europe Ltd discussion Rel-18 LTE\_UAV\_enh-Core

[R2-2305432](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305432.zip) discussion on UAV identification broadcast vivo discussion Rel-18 NR\_UAV-Core Withdrawn

[R2-2305546](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305546.zip) UAV Broadcast Identification Ericsson España S.A. discussion Rel-18

[R2-2305603](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305603.zip) UAV identification broadcast CMCC discussion Rel-18 NR\_UAV-Core

[R2-2305742](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305742.zip) Resource configuration for UAV ID broadcast Samsung discussion Rel-18 NR\_UAV-Core

[R2-2305888](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305888.zip) On How To Ensure QoS for PC5-based BRID and DAA Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_UAV-Core

[R2-2306425](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306425.zip) NR UAV BRID broadcast over PC5 Beijing Xiaomi Mobile Software discussion Rel-18 NR\_UAV-Core Late

[R2-2306493](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306493.zip) On UAV identification broadcast ZTE Corporation, Sanechips discussion Rel-18 NR\_UAV-Core

## 7.18 Mobile Terminated Small Data Transmission

(NR\_NR\_MT\_SDT-Core; leading WG: RAN2; REL-18; WID: RP-222993)

Time budget: 0.5 TU

Tdoc Limitation: 2 tdoc

### 7.18.1 Organizational

*Running CRs expected as input in this meeting: 38.300 (Nokia), 38.331 (ZTE), 38.321 (Huawei).*

*UE capabilities and running CR to 38.306 (Intel) will not be expected or discussed in this meeting*

[R2-2304795](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304795.zip) Draft running CR for MAC spec for MT-SDT Huawei, HiSilicon draftCR Rel-18 38.321 17.4.0 NR\_MT\_SDT-Core

=> update with agreements and continue discussing over email discussion

[R2-2305022](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305022.zip) Introduction of MT-SDT (RRC Running CR) ZTE Corporation (rapporteur) draftCR Rel-18 38.331 17.4.0 B NR\_MT\_SDT-Core

=> update with agreements and continue discussing over email discussion

[R2-2305750](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305750.zip) Introduction of MT-SDT in Stage-2 Nokia, Nokia Shanghai Bell draftCR Rel-18 38.300 17.4.0 NR\_MT\_SDT-Core

=> update with agreements and continue discussing over email discussion

### 7.18.2 Control plane aspects

**Paging message indication**

[R2-2304725](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304725.zip) Control plane aspects of MT SDT Procedure in RRC\_INACTIVE state Samsung Electronics Co., Ltd discussion Rel-18 NR\_MT\_SDT-Core

Proposal 1: RAN2 to discuss and agree on one of the following signaling options for MT-SDT indication in paging message:

*Option1: 1 bit MT-SDT indication is optionally included per paging record. This bit is added by extending legacy paging record;*

*Option 2 new list of paging records for MT-SDT indication is optionally included in paging message using non critical extension. Each record in this list optionally includes 1 bit MT-SDT indication. UE identity and access type are not included in paging record of this list.*

*Option 3 new list of paging records is optionally included in paging message using non critical extension. UE identity, access type and paging cause is included in paging record of this list. Paging record for UE’s with MT-SDT are included in this new list. Paging record for UE’s without MT-SDT are included in the legacy list.*

*Proposal 2: gNB may include MT-SDT indication in paging message only if UE’s I-RNTI is included in the paging message (i.e. MT-SDT is only used by RAN initiated paging).*

Discussion

- Samsung thinks that the second option is the best from a complexity point of view. Intel explains that when we use the … list it will add extra 24 bits. Intel would prefer the option 2 in the minutes here. ZTE implemented option 1 as it is the simplest and maybe we need a length indicator. Huawei also prefers option 2 to avoid adding extra 24bits. Vivo thinks we should adopt same solution as MU-SIM, option 2.

**SIB configuration**

[R2-2305806](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305806.zip) Control plane aspects of MT-SDT Huawei, HiSilicon discussion NR\_MT\_SDT-Core

*Proposal 3: The conditions checked by the RRC layer to determine whether to initiate MT-SDT procedure include:*

*• Paging with mt-SDT indication is received;*

*• SIB1 includes mt-SDT-ConfigCommon, mt-SDT-ConfigCommon may include at least sdt-RSRP-Threshold and t319a;*

*• sdt-Config is configured;*

*• Lower layers indicate that conditions for initiating MT-SDT are fulfilled.*

*Discussion on whether we need separate SIB config for MT-SDT*

- Intel thinks that we should have a separate one and we should confirm that from NW point of view to allow only access for MT-SDT. What remains to be discussed is what happens if both are configured

- ZTE agrees with the intention but was wondering if the option would be to not configure the RA-SDT resources and if you don’t have it the cell then you don’t MO-SDT. Intel thinks that works but not for CG-SDT. Huawei clarifies that this is also linked to another discussion with threshold.

- Nokia thinks that we need to have separate SIB MT-SDT configuration

**Access identifies**

[R2-2304935](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304935.zip) Discussion on subsequent transmission within MT-SDT SHARP Corporation discussion NR\_MT\_SDT-Core

Proposal 1: UE selects '0' as the Access Category when the resumption of the RRC connection is triggered by response to the MT-SDT triggering in a PAGING message.

[R2-2305021](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305021.zip) MT-SDT Control plane open isssues ZTE Corporation, Sanechips discussion

Proposal 4: MT-SDT is only applicable to the legacy MT-Access use case (i.e. it is not applicable to access identities 1, 2 and 11-15)

Proposal 3: Inform CT1 that from Rel-18 MT-SDT allows DL NAS messages to be received in INACTIVE state after paging for MT-SDT

*Discussion*

*-* Intel thinks that the intention is to use same AC as legacy.

*-* ZTE clarifies that they are talking about access identifies in proposal 4.

*-* Vodafone is not sure about access identity 10 and would like to double.

*-* Intel and Huawei that think CT1 can do it by themselves and not sure if the note would have to be updated anyways.

[R2-2304706](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304706.zip) Discussion on Supporting MT-SDT from CP Perspective vivo Mobile Com. (Chongqing) discussion Rel-18 NR\_MT\_SDT-Core

Proposal 1: A separate paging record list is introduced to carry per UE MT-SDT indication.

Proposal 2: The first entry of separate paging record list is mapped to the first entry of PagingRecordList, and so on.

Proposal 3: No new paging search space nor new P-RNTI are defined for MT-SDT procedure.

Proposal 4: No additional enhancement is needed specifically for RedCap UE to monitor paging for MT-SDT.

**Agreements:**

1. Allow support of only MT-SDT in a cell. FFS on details how to configure.
2. For paging indication signalling, a new list of paging records for MT-SDT indication is optionally included in paging message using non critical extension. Each record in this list optionally includes 1 bit MT-SDT indication. UE identity and access type are not included in paging record of this list.
3. gNB may include MT-SDT indication in paging message only if UE’s I-RNTI is included in the paging message (i.e. MT-SDT is only used by RAN initiated paging).
4. UE selects '0' as the Access Category when the resumption of the RRC connection is triggered by response to the MT-SDT triggering in a PAGING message
5. MT-SDT is only applicable to the legacy MT-Access use case (i.e. it is not applicable to access identities 1, 2 and 11-15). CB on 10
6. SRB2 can be used for MT-SDT (i.e. similar to MO-SDT)
7. No additional enhancement is needed specifically for RedCap UE to monitor paging for MT-SDT

Signaling details

[R2-2305352](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305352.zip) Further MT-SDT discussion Ericsson discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305299](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305299.zip) Discussion on control plane issues for MT-SDT OPPO discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305491](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305491.zip) MT SDT mechanism (including configuration, paging, resume and capabilities) Intel Corporation discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305527](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305527.zip) Remaining procedures for MT-SDT Sony discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305583](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305583.zip) Discussion on the configuration of MT-SDT Xiaomi discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305735](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305735.zip) Discussion on remaining CP issues for MT-SDT Lenovo discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305791](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305791.zip) Control plane aspects of MT-SDT Qualcomm Incorporated discussion NR\_MT\_SDT-Core

[R2-2305806](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305806.zip) Control plane aspects of MT-SDT Huawei, HiSilicon discussion NR\_MT\_SDT-Core

[R2-2305906](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305906.zip) CP aspects for MT-SDT procedure Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MT\_SDT-Core

[R2-2306128](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306128.zip) Discussion on DL SPS for MT-SDT ASUSTeK discussion Rel-18 NR\_MT\_SDT-Core

[R2-2306141](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306141.zip) Support of SPS in MT-SDT LG Electronics Inc. discussion Rel-18 NR\_MT\_SDT-Core

[R2-2306160](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306160.zip) Discussion on MT-SDT Apple discussion Rel-18 DUMMY

[R2-2306341](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306341.zip) Consideration on CP common aspects of MT-SDT China Telecom Corporation Ltd. discussion

[R2-2306399](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306399.zip) Consideration on CP aspects for MT-SDT CATT discussion Rel-18 NR\_MT\_SDT-Core

### 7.18.3 User plane aspects

Initial RACH and CCCH message over CG-SDT

[R2-2305751](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305751.zip) MT-SDT UP impacts Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MT\_SDT-Core

*Proposal 1: RRC indicates to MAC whether MT-SDT or MO-SDT conditions need to be evaluated.*

- Intel thinks that we should discuss this based on running CRs. LG thinks we can discuss this after we agree to thinks in MAC. LG is not sure whether there is a difference from the MAC perspective. Sony thinks that if the UE has UL data we need to check data volume. Intel explains that we agreed that we have two independent procedures.

*Observation 1: CCCH SDU can always be multiplexed into CG-SDT resource.*

*Proposal 2: For MT-SDT, LCH restrictions are not checked as CG-SDT condition.*

- ZTE thinks that we need to allow the CCCH to go through. Intel agrees. Huawei thinks that this is related to the case where there is data. Intel doesn’t see any concerns to allowing the UE to used the grant. LG has a different understanding from Intel. If there is UL data it should be restricted like legacy procedure. LG clarifies that LCH restriction should only be applied for DRB. Intel thinks that we don’t check for UL data. Sony disagrees, we should check for UL data. LG explains that in case there is UL data we need to check. Huawei thinks that we agreed to not check data volume in RRC.

*Proposal 3: RA-SDT resources are not used for MT-SDT procedure.*

- Huawei thinks that the case where UL data becomes available can happen and we should ensure we can transmit UL data. Ericsson agrees to proposal 3.

- LG wonders why we are restricting use of RA-SDT if it is configured. Huawei thinks that they can be used when there is UL data. LG thinks that this makes the specification more complicated. ZTE explains that we need to keep the MO-SDT and MT-SDT separate. Intel agrees and also RAN3 is working on separate.

- Qualcomm thinks that we didn’t discuss the RA-SDT resource for MT-SDT.

- Sony is concerned about what happens when UL data is triggered. Samsung explains that if the UE has UL data the UE can still check and trigger MO-SDT anyways and still check data threshold etc.

*Proposal 4: In case CG-SDT resources cannot be used or are not available for MT-SDT, UE uses common RACH for RA-based MT-SDT.*

[R2-2305805](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305805.zip) User plane aspects of MT-SDT Huawei, HiSilicon discussion NR\_MT\_SDT-Core

Proposal 4: A UE responds to paging with MT-SDT using R17 RA-SDT resource with the resume cause value set to mt-SDT when the UE has UL SDT data to send.

Agreements:

1. RRC explicitly indicates to MAC whether resume is trigged due to MT-SDT
2. LCH restrictions are checked for DRBs as in MO-SDT (if UL data is available during SDT procedure). Ensure CCCH can be transmitted in CG-SDT when MT-SDT is triggered in stage 3 discussion.
3. Assumption is that if the UE has UL data the UE can still check and trigger MO-SDT (it is up to UE implementation)
4. RA-SDT resources are not used for MT-SDT initiation RACH
5. In case CG-SDT resources cannot be used or are not available for MT-SDT, UE uses non-SDT RACH for RA-based MT-SDT. FFS whether new triggers are defined

**SPS**

[R2-2305807](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305807.zip) SPS support for MT-SDT Huawei, HiSilicon, Xiaomi, vivo, LGE, CMCC discussion NR\_MT\_SDT-Core

[R2-2306527](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306527.zip) On support of DL SPS MediaTek Inc. discussion Rel-18

CG SDT

[R2-2305557](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305557.zip) Discussion on MT-SDT procedure Spreadtrum Communications discussion Rel-18

Proposal 1: If the CG periodicity of valid CG-SDT resource is too long, the RACH resource can be selected first.

[R2-2305595](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305595.zip) Discussion on MT-SDT procedure Continental Automotive discussion Rel-18

Proposal 1: It would be beneficial for the UE to know which UL resources it has to use to transmit the paging response when the CG periodicity is too long.

Proposal 2: The network provides an indication in the paging message whether the UE should use RA-SDT or CG-SDT to transmit the paging response.

[R2-2304706](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304706.zip) Discussion on Supporting MT-SDT from CP Perspective vivo Mobile Com. (Chongqing)

CG resources

Proposal 6: Only the initial BWP (including the separate initial BWP for RedCap) is used for MT-SDT procedure.

Proposal 7: Separate CG resources specific to MT-SDT is supported.

Proposal 8: Separate CG resources specific to MT-SDT can be configured on SUL carrier and NUL carrier.

[R2-2305953](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305953.zip) MT SDT mechanism (including CG and ROHC) Intel Corporation discussion Rel-18 NR\_MT\_SDT-Core

Proposal 1. There is no need to define new Rel-18 CG configurations specific to MT-SDT.

Proposal 3. When resuming for MT-SDT, gNB informs whether UE whether the PDCP entity of the radio bearers configured for MT-SDT continues or resets the ROHC header compression protocol during PDCP re-establishment during SDT procedure.

[R2-2306379](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306379.zip) Handling BWP restrictions in MT-SDT Ericsson discussion Rel-18 NR\_MT\_SDT-Core

Proposal 1 Choose from among the following options to handle BWP restriction in MT-SDT

Option 1: Remove CORESET 0 restriction for DL BWP for UEs from/after first DL MT-SDT data

Option 2: Introduce Channel Quality Indication (CQI) in Message 3 or Msg A

Option 3: Optimisations to reduce subsequent transmission overhead

Proposal 2 Introduce a DCQR MAC CE which can be multiplexed into Msg3, MsgA or the initial CG-SDT transmission in the MT-SDT procedure

Proposal 3 Send an LS to RAN1 to ask about the feasibility to introduce CQI reporting in Msg3 for MT-SDT.

Proposal 4 Discuss whether to introduce multi-TB support to reduce the number DCIs for scheduling multiple PDSCH transmissions as part of subsequent DL transmissions.

Proposal 5 For subsequent DL transmissions to transmit the new incoming data during an ongoing MT-SDT procedure, the gNB can schedule the PDSCH transmissions as in MO-SDT.

Proposal 6 For subsequent UL transmissions to transmit the new incoming data during an ongoing MT-SDT procedure, follow the dynamic scheduling based on the contents of BSR as in MO-SDT.

[R2-2305805](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305805.zip) User plane aspects of MT-SDT Huawei, HiSilicon discussion NR\_MT\_SDT-Core

Proposal 1: MAC layer should know whether MO-SDT or MT-SDT conditions should be checked when the resume is triggered by RRC layer.

Proposal 3: When responding to MT-SDT Paging, the UE initiates the MT-SDT procedure using legacy RACH resource with the resume cause value set to mt-SDT when the UE has no UL data to send or there are no SDT RACH resources available.

Proposal 4: A UE responds to paging with MT-SDT using R17 RA-SDT resource with the resume cause value set to mt-SDT when the UE has UL SDT data to send.

[R2-2306142](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306142.zip) Discussion on MT-SDT procedure LG Electronics Inc. discussion Rel-18 NR\_MT\_SDT-Core

Proposal 2. When the paging message for MT-SDT is received but MT-SDT criteria is not satisfied, RRCResume cause is set to mt-Access.

Proposal 3. UE transmits a positive HARQ feedback to the network upon receiving the paging message for MT-SDT.

Proposal 4. CG-SDT-TAT is restarted upon receiving the paging message for MT-SDT.

[R2-2304707](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304707.zip) Discussion on Supporting MT-SDT from UP Perspective vivo Mobile Com. (Chongqing) discussion Rel-18 NR\_MT\_SDT-Core

[R2-2304726](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304726.zip) User plane aspects of MT SDT Procedure in RRC\_INACTIVE state Samsung Electronics Co., Ltd discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305023](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305023.zip) MT-SDT user plane open isssues ZTE Corporation, Sanechips discussion

[R2-2305300](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305300.zip) Discussion on user plane issues for MT-SDT OPPO discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305353](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305353.zip) Handling BWP restrictions in MT-SDT Ericsson discussion Rel-18 NR\_MT\_SDT-Core Withdrawn

[R2-2305736](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305736.zip) Discussion on remaining UP issues for MT-SDT Lenovo discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305751](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305751.zip) MT-SDT UP impacts Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MT\_SDT-Core

[R2-2305793](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305793.zip) User plane aspects of MT-SDT Qualcomm Incorporated discussion NR\_MT\_SDT-Core

[R2-2306342](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306342.zip) Consideration on UP common aspects of MT-SDT China Telecom Corporation Ltd. discussion

[R2-2306400](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306400.zip) Consideration on UP aspects for MT-SDT CATT discussion Rel-18 NR\_MT\_SDT-Core

## 7.23 Timing Resiliency and URLLC Enh

(NR\_TRS\_URLLC; leading WG: RAN3; REL-18; WID: RP-230754)

Time budget: 0.5 TU

Tdoc Limitation: 2 tdoc

### 7.23.1 Organizational

Incoming LSs, Rapporteur input etc.

[R2-2304605](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304605.zip) Response to Reply LS on Proposed method for Time Synchronization status reporting to UE(s) (C1-232942; contact: Nokia) CT1 LS in Rel-18 TRS\_URLLC To:RAN2, SA1 Cc:SA2, RAN3

=> Noted

[R2-2304621](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304621.zip) Reply LS on proposed method for time synchronization status reporting to UE(s) (R3-230811; contact: Nokia) RAN3 LS in Rel-18 FS\_5TRS\_URLLC To:SA2, RAN2

=> Noted

[R2-2305655](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305655.zip) Stage 2 running CR on timing resiliency and URLLC Nokia, Nokia Shanghai Bell discussion Rel-18 TRS\_URLLC-NR-Core

=> The CR will be updated after the meeting and can be reviewed over email discussion

### 7.23.2 General

[R2-2305656](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305656.zip) 5GS network timing synchronization status and reporting Nokia, Nokia Shanghai Bell discussion Rel-18 TRS\_URLLC-NR-Core

*Proposal 1: update of event ID is informed to UE by normal SI modification procedure.*

[R2-2305129](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305129.zip) Clock Quality Report Delivery Qualcomm Incorporated discussion Rel-18

*Proposal 1: Clock quality updates in SIB9 can be indicated to IDLE/INACTIVE UEs subscribed to TaaS using Short Messages.*

[R2-2304842](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304842.zip) Discussion on the update of event ID Huawei, HiSilicon discussion Rel-18 TRS\_URLLC-NR-Core

Proposal 1: The change of Event ID field in SIB9 should be excluded when determining changes in system information.

*Discussion*

- Nokia asks if the assumption that the UE always has to read SIB9. Huawei thinks that the UE has to read the time anyways before. Nokia explains that the UE only reads it once. Apple thinks that it is not preferable that the UE continuously does it.

- Samsung thinks that the change of event ID happens rarely so we can just follow existing SI modification procedure. Ericsson asks if we know the frequency of the expected change. Samsung explains that the major scenario doesn’t require the gNB to change the clock very frequently.

- Apple thinks that we should use short message such that we don’t wake up the UE. ZTE also doesn’t prefer to woke up the all the UEs.

- Vivo thinks that the short message would be useful.

- CATT agrees that we don’t need to do any specific optimization and anyways we have many other SIBs that require paging all UEs but they are not relevant to all UEs. Ericsson would like to avoid using the extra short message bits. Huawei also agrees.

[R2-2305656](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305656.zip) 5GS network timing synchronization status and reporting Nokia, Nokia Shanghai Bell discussion Rel-18 TRS\_URLLC-NR-Core

*Proposal 2: Confirm the AS layer of the UE determines if there a change of event ID and gNB ID. If there is a change, the AS layer notifies the change in the RAN timing synchronization status to NAS layer. For both IDLE and INACTIVE mode, NAS layer requests the RRC layer to move to RRC\_CONNECTED.*

- Apple thinks that perhaps the UE doesn’t always have to notify the NAS as we have tools to synchronize. Vivo thinks that we can discuss further how the AS determines the change.

- ZTE thinks that we need to discuss the case for same gNB so there may need to consider additional information besides the event ID. Samsung explains that the RAN3 understanding is that the event can be uniquely set and there would be no problem. Nokia also explains that even the LS provides this information that only event ID can be support.

*Proposal 3: For RRC\_CONNECTED mode UEs, the NW has the necessary information to determine whether to send detailed clock quality information to the UE, (i.e. it may choose to always send update or only when needed) and the details can be left to NW implementation.*

[R2-2304704](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304704.zip) Further Discussion on 5G Clock Quality Information Reporting vivo Mobile Com. (Chongqing) discussion Rel-18 TRS\_URLLC-NR-Core

*Proposal 2: RAN2 to further discuss timing synchronization change based on the understanding that the field of event ID can be present or not.*

*Proposal 3: Under the same gNB, UE considers the change of timing synchronization status by comparison of stored and obtained event ID field from SIB9 in the following ways:*

*- empty vs. present*

*- present vs. empty*

*- different values*

- Huawei asks when would the network set event ID to empty. Vivo thinks this is NW implementation. Qualcomm thinks that the only one to consider is different values. Nokia thinks that different values makes sense and is not sure about the empty case. Vivo explains that there is the case where the network doesn’t support the feature. Samsung agrees that the only scenario that exists is that the NW support, otherwise it should always be there.

- CATT clarifies that according to SA2 the field is optional. Nokia thinks that we need to agree that in RAN2 we need to always broadcast the event ID otherwise it doesn’t work. Vivo would be fine if this is captured in the specification. CATT would like to check a bit offline. Ericsson thinks we should have the assumption that if we support the feature we should broadcast the information. Qualcomm thinks that if the field is absence there is nothing to do.

[R2-2305967](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305967.zip) Discussion on the issue of RACH congestion ZTE Corporation, Sanechips discussion Rel-18 TRS\_URLLC-NR-Core

*Proposal 3: RAN2 discusses that in RRC\_ INACTIVE state UE acquire clock quality information through SDT procedure.*

­- ZTE thinks that the time quality information can be provided in INACTIVE if SDT is supported/configured.

- Nokia asks if we would need a change to SDT procedure because we allow SRB2 in SDT. ZTE thinks that we may need another trigger. Samsung thinks that this doesn’t happen so often so no need to optimize RACH. Apple thinks that it makes sense to always move the UE in Connected. The newtwork can also trigger a DL information transfer to the UE in active.

- Huawei asks whether we are discussing MO-SDT or MT-SDT. Nokia understood that the NAS will trigger the MO-SDT like in legacy. Huawei is concerned that we don’t have any UL data. ZTE explains that NAS will put a message and this can trigger MO-SDT. For MT-SDT then the network can just page, the UE will put the MT-SDT cause and it is up to the network to put a message in a DL.

**Agreements**

1. Update of event ID is informed to UE by normal SI modification procedure.
2. Confirm the AS layer of the UE determines if there a change of event ID and/or gNB ID. If there is a change, the AS layer notifies the change in the RAN timing synchronization status to NAS layer. For both IDLE and INACTIVE mode, NAS layer may requests the RRC layer to move to RRC\_CONNECTED
3. For RRC\_CONNECTED mode UEs, the NW has the necessary information to determine whether to send detailed clock quality information to the UE, (i.e. it may choose to always send update or only when needed) and the details can be left to NW implementation
4. Event ID is optional. Under the same gNB, UE considers the change of timing synchronization if event ID field from SIB9 is different. FFS if gNB always broadcasts event ID
5. If the UE is in RRC\_INACTIVE, the UE can acquire clock quality information using the SDT procedure, if it supports and/is configured with SDT procedure.

BAT discussion

*Agreements Copied from XR session minutes*

* 1. UE reports to RAN the range of jitter in its UL traffic, defined in the similar way as the one for N6 jitter.
* 2: Reference time is defined in similar way as BAT (Burst Arrival Time) at UE side.
* 3 RRC UAI framework is updated for Rel-18 to support signalling UL assistance information agreed so far for XR (Jitter, burst arrival time, FFS on periodicity).

[R2-2305657](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305657.zip) Reactive RAN feedback for upstream scheduling Nokia, Nokia Shanghai Bell discussion Rel-18 TRS\_URLLC-NR-Core

*Proposal 1: confirm it is feasible for gNB implementation to derive BAT offset based on available information.*

*Proposal 2: confirm no UE report is needed for objective 3 on BAT offset derivation and we can close the objective in RAN2.*

**Agreements:**

- No new UE report is needed for objective 3 on BAT offset derivation. The XR mechanism can be used if the network configures it, otherwise we can use legacy BSR. We can close the objective in RAN2

[R2-2304705](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304705.zip) Discussion on RAN feedback for Upstream Scheduling vivo Mobile Com. (Chongqing) discussion Rel-18 TRS\_URLLC-NR-Core

[R2-2304841](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304841.zip) Discussion on TSS change notification procedure Huawei, HiSilicon discussion Rel-18 TRS\_URLLC-NR-Core

[R2-2304972](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304972.zip) RAN2 Impact of 5GS network timing synchronization status and reporting CATT discussion Rel-18 TRS\_URLLC-NR-Core

[R2-2304973](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2304973.zip) Discussion on RAN feedback CATT discussion Rel-18 TRS\_URLLC-NR-Core

[R2-2305079](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305079.zip) RAN feedback for burst sending time adjustment Apple discussion Rel-18 DUMMY

[R2-2305080](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305080.zip) 5GS Network Timing Synchronization in RRC\_INACTIVE Apple discussion Rel-18 DUMMY

[R2-2305130](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305130.zip) UL BAT Derivation at RAN Qualcomm Incorporated discussion Rel-18

[R2-2305627](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305627.zip) Discussion on the network timing synchronization status monitoring CMCC discussion Rel-18

[R2-2305738](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305738.zip) Signaling of 5G Clock Quality Information Samsung discussion Rel-18

[R2-2305739](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305739.zip) Time Synchronization Status Update via EventID Samsung discussion Rel-18

[R2-2305966](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2305966.zip) Further discussion on time synchronization status and reporting ZTE Corporation, Sanechips discussion Rel-18 TRS\_URLLC-NR-Core

[R2-2306343](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306343.zip) Discussion on 5G network timing synchronization status and reporting China Telecom Corporation Ltd. discussion

[R2-2306464](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306464.zip) Burst Arrival Time (BAT) offset derivation Ericsson discussion Rel-18 TRS\_URLLC-NR-Core

[R2-2306473](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306473.zip) Discussion on NR timing resiliency Ericsson discussion Rel-18 TRS\_URLLC-NR-Core

# 8 Breakout session reports

No documents shall be submitted to this AI or its sub-AIs. It is only for at-meeting-generated contents.

## 8.1 Session on NR NTN and IoT NTN

[R2-2306541](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306541.zip) Report from Break-Out Session on NR NTN and IoT NTN Vice Chairman (ZTE) Report

## 8.2 Session on LTE legacy, XR, QoE and Multi-SIM

[R2-2306542](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306542.zip) Report from session on LTE legacy, XR, QoE and Multi-SIM Vice Chairman (Nokia) Report

## 8.3 Session on UP, Small data, URLLC/IIoT, RACH indication, NWES and UAV

[R2-2306543](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306543.zip) Report from UP, Small data, URLLC/IIoT, RACH indication, NWES and UAV Session chair (InterDigital) Report

## 8.4 Session on positioning and sidelink relay

[R2-2306544](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306544.zip) Report from session on positioning and sidelink relay Session chair (MediaTek) Report

## 8.5 Session on LTE V2X and NR SL

[R2-2306545](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306545.zip) Report from session on LTE V2X and NR SL Session chair (Samsung) Report

## 8.6 Session on SON/MDT

[R2-2306546](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306546.zip) Report from SON/MDT session Session chair (CMCC) Report

## 8.7 Session on MBS

[R2-2306547](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306547.zip) Report from MBS breakout session Session chair (Huawei) Report

## 8.8 Session on IDC

[R2-2306548](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306548.zip) Report from IDC breakout session Session chair (Intel) Report

## 8.9 Session on NC Repeater

[R2-2306549](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306549.zip) Report from NC Repeater breakout session Session chair (Apple) Report

## 8.10 Session on eRedCap

[R2-2306550](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306550.zip) Report from eRedCap breakout session Session chair (Ericsson) Report

## 8.11 Session on Further NR coverage enhancements

[R2-2306551](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306551.zip) Report from Further NR coverage enhancements session Session chair (ZTE) Report

## 8.12 Session on NR MIMO evolution

[R2-2306552](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_122\Docs\R2-2306552.zip) Report from NR MIMO evolution session Session chair (CATT) Report