3GPP TSG-RAN WG2 Meeting #113bis electronic R2-2104302

Online, April 12th - 20th, 2021

**Agenda item: 10.2**

**Source: Vice Chairman (ZTE Corporation)**

**Title: Report from Break-out session on R17 NTN and REDCAP**

**Document for: Approval**

General

Recording of voice or video at meetings is not used in 3GPP. This applies also to this e-Meeting. At this e-Meeting, no specific actions are taken to prevent the recording of web conferences. Companies that have concerns related to recordings, if any, may express those by email in the main meeting organizational thread [AT113bis-e][000]

Organizational

1. All organization emails and notes will be shared over the following email discussion throughout the meeting:

* [AT113bis-e][100] ****Organizational - NTN & REDCAP session (RAN2 VC)****

Scope:

* + - Share plans for the meeting and list of ongoing email discussions for the sessions related to NTN and REDCAP
    - Share meetings notes and agreements for review and endorsement

Schedule/Plan

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** | **Web Conference R2 - BO2** |
| **Monday** |  |  |  |
| 12:15-13:05 | NR15 NR16 Main session (Johan) | NR16 Pos (Nathan) | **NR17 NTN (Sergio)**  **[8.10.1] Organizational**  **[8.10.2.1]**  **- [Post113-e][106] outcome**  **- other RACH aspects**  **[8.10.2.2]**  **- HARQ & LCP aspects**  **[8.10.2.3]**  **- [Post113-e][107] outcome** |
| 13:05-14:25 | NR15 NR16 Main session (Johan) | NR16 V2X (Kyeongin) | **NR17 NTN (Sergio)**  **[8.10.3.1]**  **- TAC update aspects**  **[8.10.3.3]**  **- [Post113-e][108] outcome**  **- CHO aspects** |
| 14:25-15:45 | NR17 Multicast (Johan) | NR16 DCCA (Tero)  - [Post113-e][224] outcome  - NR-DC cell grouping  NRLTE16 MOB (Tero)  - RRC reconfig with DAPS release  - RLF/re-establishment and DAPS  LTE16e (Tero)  - [Post113e][206] outcome  - LTE Rel-15 topics  - LTE Rel-16 topics | LTE17 IoT (Brian)  [9.1.1] Organizational  [9.1.3] Carrier selection |
| **Tuesday** |  |  |  |
| 12:15-13:05 | NR17 eNPN (Johan) | NR17 RAN Slicing SI (Tero)  - Cell reselection  - RACH | NR17 SL Relay (Nathan)  - Organisational  - Discovery  - Re/selection (if time) |
| 13:05-14:25 | NR17 ePowSav (Johan) | NR17 Multi-SIM (Tero)  - Network switching  - Paging collision | NR17 SL enh (Kyeongin) |
| 14:25-15:45 | R17 Other (Johan) | NR17 SONMDT (HuNan) | NR17 Small Data Enh (Diana)  - email discussions [501][502][503] |
| **Wednesd** |  |  |  |
| 04:00-05:00 | NR17 Multicast (Johan) | **NR17 RedCap (Sergio)**  **[8.12.1] Organizational**  **[8.12.3.1]**  **- [AT113bis-e][101] outcome**  **- continue on eDRX aspects**  **[8.12.3.2]**  **- [AT113bis-e][102] outcome**  **- continue on RRM relaxations aspects** | NR16 SONMDT (HuNan) |
| **Thursday** |  |  |  |
| 04:00-05:00 | NR17 QoE SI (Johan) | NR17 DCCA (Tero)  - SCG deactivation  - UE measurements in deactivated SCG  - SCG activation | LTE17 IoT (Brian)  [9.1.4] Other |
| **Friday** |  |  |  |
| 04:00-05:00 | NR17 eIAB (Johan) | NR17 Pos (Nathan)  - Organisational  - Latency enhancements  - RRC\_INACTIVE | LTE16e IoT (Emre) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** | **Web Conference R2 - BO2** |
| **Monday** |  |  |  |
| 12:15-13:05 | NR17 IoT NTN (Johan) | NR16 SONMDT / NR17 SONMDT (HuNan) | NR16 V2X / NR17 SL enh (Kyeongin) |
| 13:05-14:25 | NR17 eIAB (Johan)  NR15 NR16 NR17 Main session (Johan) | LTE17 (Tero)  - GSMA LS on Scell attack  - SA3 LS on UPIP for LTE  NR16 DCCA (Tero)  - Outcome of [220]  - Outcome of [221]  NRLTE16 MOB (Tero)  - Outcome of [210]  - Outcome of [211]  LTE16e (Tero)  - Outcome of [201] (if needed) | NR17 Pos (Nathan)  - RRC\_INACTIVE (cont.)  - On-demand PRS  - Integrity |
| 14:25-15:45 | NR15 NR16 NR17 Main session (Johan) | **CB Sergio**  **[NR-NTN]**  **- Outcome of [104] and [106]**  **[RedCap]**  **- Outcome of [101] and [102]** | NR17 SL Relay (Nathan)  - Re/selection (cont.)  - L2 specific topics |
| **Tuesday** |  |  |  |
| 12:15-13:05 | CB Johan | CB Diana  [SDT]  - Outcome of SDT User Plane offline discussion ([AT113bis-e][SDT][501]  - outcome of any other offline discussions | **CB Sergio**  **[NR-NTN]**  **- Outcome of [103], [105] and [107]** |
| 13:05-14:25 | CB Johan | CB Tero  NR17 DCCA  - Outcome of [Post11e-e][234]  - Outcome of any SCG deactivation offline discussion(s)  Multi-SIM  - Outcome of any offline discussion(s)  RAN slicing  - Outcome of any offline discussion(s) | CB Nathan |
| 14:25-15:45 | CB Johan | CB Kyeongin | CB Brian Emre  [9.1.2] Treat RAN4 reply if available, email discussion scope. |

List and status of offline email discussions

NOTE: No offline email discussions will be kicked off before Monday April 12th, 07:00 UTC

* [AT113bis-e][101][RedCap] eDRX cycles (Intel)

Final scope: Continue the discussion on the following aspects:

1. FFSs on eDRX configuration, e.g. based on p4.x from [R2-2104360](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104360.zip)
2. p5, p6, p7 from [R2-2102852](file:///C:\Data\3GPP\Extracts\R2-2102852_NR-eDRX.docx)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Friday 2021-04-16 02:00 UTC

Final deadline (for rapporteur's summary in [R2-2104367](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104367.zip)): Friday 2021-04-16 06:00 UTC

Proposals marked "for agreement" in [R2-2104367](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104367.zip) not challenged until Monday 2021-04-19 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Monday CB session.

Status: Closed

* [AT113bis-e][102][RedCap] RRM relaxations (Qualcomm)

Final scope: Check whether revised p3 from second round of offline [102] is agreeable

Final intended outcome: Agreeable revised p3

Final deadline (for rapporteur's proposal in R2-2104375): Tuesday 2021-04-20 00:00 UTC

If the proposal in R2-2104375 will not be challenged until Tuesday 2021-04-20 12:00 UTC, it will be declared as agreed via email by the session chair.

Status: Ongoing

* [AT113bis-e][103][NTN] RACH aspects (Oppo)

Final scope: Discuss a revision of proposals from [R2-2104362](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104362.zip), apart from p3

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Monday 2021-04-19 16:00 UTC

Initial deadline (for rapporteur's summary in R2-2104370): Monday 2021-04-19 18:00 UTC

Proposals marked "for agreement" in R2-2104370 not challenged until Tuesday 2021-04-20 08:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue offline in the Tuesday CB session

Status: Ongoing

* [AT113bis-e][104][NTN] Other MAC aspects (Ericsson)

Final scope: Discuss a revision of proposals from [R2-2104363](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104363.zip)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Friday 2021-04-16 06:00 UTC

Final deadline (for rapporteur's summary in [R2-2104369](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104369.zip)): Friday 2021-04-16 10:00 UTC

Proposals marked "for agreement" in [R2-2104369](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104369.zip) not challenged until Monday 2021-04-19 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Monday CB session

Status: Ongoing

* [AT113bis-e][105][NTN] TAC update (Huawei)

Final scope: Discuss a revision of proposals from [R2-2104364](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104364.zip)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Monday 2021-04-19 15:00 UTC

Final deadline (for rapporteur's summary in R2-2104371): Monday 2021-04-19 17:00 UTC

Proposals marked "for agreement" in R2-2104371 not challenged until Tuesday 2021-04-20 08:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Tuesday CB session

Status: Ongoing

* [AT113bis-e][106][NTN] SMTC and gaps (Intel)

Final scope: Discuss a revision of proposals from [R2-2104365](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104365.zip)

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Friday 2021-04-16 08:00 UTC

Initial deadline (for rapporteur's summary in [R2-2104372](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104372.zip)): Friday 2021-04-16 10:00 UTC

Proposals marked "for agreement" in [R2-2104372](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104372.zip) not challenged until Monday 2021-04-19 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue offline in the Monday CB session

Status: Ongoing

* [AT113bis-e][107][NTN] CHO aspects (Nokia)

Final scope: Discuss a revision of proposals from [R2-2104366](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104366.zip)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Monday 2021-04-19 18:00 UTC

Final deadline (for rapporteur's summary in R2-2104373): Monday 2021-04-19 22:00 UTC

Proposals marked "for agreement" in R2-2104373 not challenged until Tuesday 2021-04-20 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Tuesday CB session

Status: Ongoing

* [AT113bis-e][108][RedCap] LS on eDRX cycles (Ericsson)

Scope: Discussion the content of an LS to SA2/CT1 based on meeting agreements. Check if additional questions/RAN2 preferences can be included in the LS (based on the discussion in the meeting).

Intended outcome: Approved LS

Deadline (for companies' feedback): Monday 2021-04-26 16.00 UTC

Deadline (for final LS in R2-2104374): Tuesday 2021-04-27 16.00 UTC

Status: Ongoing

## 8.10 NR Non-Terrestrial Networks (NTN)

(NR\_NTN\_solutions-Core; leading WG: RAN2; REL-17; WID: RP-210908)

Time budget: 1.5 TU

Tdoc Limitation: 5 tdocs

Email max expectation: 5 threads

### 8.10.1 Organizational

LSs, rapporteur inputs and other organizational documents. Rapporteur inputs and other pre-assigned documents in this AI do not count towards the tdoc limitation.

Incoming LSs

[R2-2102617](file:///C:\Data\3GPP\Extracts\R2-2102617_R1-2102074.docx) Reply LS on AN-PDB and PER targets for satellite access (R1-2102074; contact: Qualcomm) RAN1 LS in Rel-17 NR\_NTN\_solutions, 5GSAT\_ARCH To:SA2, RAN2 Cc:RAN3

* Noted (no action for RAN2)

[R2-2102602](file:///C:\Data\3GPP\Extracts\R2-2102602_C1-210439.doc) LS on extraterritorial use of MCC for satellite access (C1-210439; contact: Qualcomm) CT1 LS in Rel-17 5GSAT\_ARCH-CT To:SA1 Cc:SA2, RAN2, SA3

* Noted (no action for RAN2)

[R2-2102656](file:///C:\Data\3GPP\Extracts\R2-2102656_S1-210358.doc) Reply LS on extraterritorial use of MCC for satellite access (S1-210358; contact: Qualcomm) SA1 LS in Rel-17 5GSAT\_ARCH-CT To:CT1 Cc:SA2, RAN2, SA3

* Noted (no action for RAN2)

[R2-2102655](file:///C:\Data\3GPP\Extracts\R2-2102655_S1-210357.doc) Reply LS on timer for periodic network selection attempts in satellite access (S1-210357; contact: OPPO) SA1 LS in Rel-17 5GSAT\_ARCH-CT To:CT1 Cc:RAN2, CT6

* Noted (no action for RAN2)

Workplan

[R2-2103469](file:///C:\Data\3GPP\Extracts\R2-2103469-Rel17%20NR-NTN%20workplan%20updated%20v27.docx) NR\_NTN\_solutions work plan THALES Work Plan Rel-17 NR\_NTN\_solutions

* Thales informs SA2 has decided to introduce a new QoS for NTN
* Ericsson highlights that Idle mode needs to be handled at RAN2#114-e
* Noted

Running CRs

[R2-2103829](file:///C:\Data\3GPP\Extracts\38331_runningCR_%20R2-2103829_Stage3%20NTN.docx) Stage-3 running RRC CR for NTN Rel-17 Ericsson draftCR Rel-17 38.331 16.4.1 NR\_NTN\_solutions-Core

[R2-2103969](file:///C:\Data\3GPP\Extracts\R2-2103969%20(R17%20NTN%20WI%20AI%208.10.1)%20NTN%2038.321%20running%20CR.docx) Stage 3 running CR 38.321 - RAN2#113bis-e InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104289](file:///C:\Data\3GPP\Extracts\R2-2104289_Stage-3%20running%20304%20CR%20for%20NTN.docx) Stage-3 running 304 CR for NTN ZTE corporation, Sanechips draftCR Rel-17 38.304 16.4.0 B NR\_NTN\_solutions-Core

Other

[R2-2103698](file:///C:\Data\3GPP\Extracts\R2-2103698%20Draft%20%20LS%20to%20RAN1%20about%20PCI%20issue%20in%20NTN.docx) DRAFT LS to RAN1 about PCI issue in NTN CMCC LS out Rel-17 NR\_NTN\_solutions-Core To:RAN1 Cc:RAN3,RAN4

* VC: this was previously discussed and there was not enough support to send an LS to RAN1. We should only revisit this decision if anything changes
* Noted

### 8.10.2 User Plane

[R2-2103968](file:///C:\Data\3GPP\Extracts\R2-2103968%20(R17%20NTN%20WI%20AI%208.10.2)%20MAC%20Open%20Issues.docx) MAC open issues - RAN2#113bis-e InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 2 RAN2 sends an LS to RAN1 to kindly ask them to prioritize the topic of pre-compensation, also indicating RAN2's dependency on RAN1's progress.

* Xiaomi thinks we should send the LS earlier
* Continue the discuss during the meeting first and then check whether we need to send an LS (and the content)

#### 8.10.2.1 RACH aspects

Including the outcome of [POST113-e][106][NTN] MAC aspects (Huawei). No company inputs expected on aspects covered by [POST113-e][106]

[R2-2103630](file:///C:\Data\3GPP\Extracts\R2-2103630%20Report%20of%20%5bPOST113-e%5d%5b106%5d%5bNTN%5d%20MAC%20aspects%20(Huawei).docx) Report of [POST113-e][106][NTN] MAC aspects (Huawei) Huawei, HiSilicon report Rel-17 NR\_NTN\_solutions-Core

* RA type selection:

Proposal 1: RAN2 to further discuss criteria for RA type selection:

Option 1: based on “UE specific UE-satellite RTT” or “distance between UE and satellite”;

Option 2: based on QoS requirement (e.g., delay) of logic channel;

Option 3: only use RSRP as in legacy.

- QC: Option 1 or 2 alone won't work. They have to be combined with option 3, which is the baseline. Xiaomi agrees and suggests to focus on option 3

- ZTE thinks no optimization is needed. We can reuse option 3 as in legacy. Ericsson agrees.

- Samsung thinks that RSRP is not enough

* Legacy mechanism for RA type selection based on RSRP threshold is the baseline for NTN. Optimizations can still be suggested, showing the gain (in any case, any method needs to be combined with RSRP based approach)

Proposal 2: if new criteria is agreed, it should be combined with legacy RSRP threshold for RA type selection.

- Ericsson wonders what combined means

* Agreed. If new criteria is suggested, it should be combined with legacy RSRP threshold for RA type selection (FFS what "combined" means)

Proposal 3: if new criteria based on delay QoS requirement of logic channel is agreed, further discuss how to implement it, e.g. a new configuration to allow or prevent LCH to use 2-step RA.

Proposal 4: reuse legacy RA type switching mechanism.

* Agreed
* TA report:

Proposal 5: RAN2 to discuss which way to go:

Option 1: UE reports User specific TA (NTA as defined by RAN1) to network. RAN2 can revisit it if RAN1 agrees to assistance information other than User specific TA;

Option 2: postpone the reporting of TA or position until RAN1 have concluded.

Proposal 6: RAN2 to further discuss how to trigger TA report:

Option 1: TA report can be triggered when RACH is initiated, and whether TA report is included in MSG3/MSG5 or MSGA/next UL Grant following MSGB depends on existing LCP procedure;

Option 2: TA report can be triggered by some event or rule, e.g. If the difference between the current TA used by the UE and the TA value known to gNB (=the value last reported by the UE) exceeds a threshold; or by a threshold/hysteresis in the UE (the threshold can be wrt the last reported TA + common drift rate);

Option 3: Whether UE reports UE-calculated TA to NW and in which message the report should be included should only be controlled by NW.

Proposal 7: If user specific TA is agreed to be reported, the exact reported User specific TA value is derived by updating the initial User specific TA by received TA command.

Proposal 8: MAC CE is used to send TA report.

- Ericsson thinks there is an issue in sending the TA (or TA + drift) multiple times in NTN, as this would reveal the UE position

- Mediatek thinks that MAC CE is fine.

- Oppo thinks that sending the TA is not the same as disclosing the UE location.

- Qualcomm think the initial TA report needs to be provided at the beginning (msg3 or msg5). In connected mode, when security is enabled we can discussed whether to send further TAs or the UE location.

Proposal 9: network can request UE to report User specific TA, and configure UE to perform periodic TA reporting.

* sr-ProhibitTimer:

Proposal 10: Extend the timer length of sr-ProhibitTimer by adding the UE specific RTD to the configured sr-ProhibitTimer length.

- Ericsson thinks it should be possible to set this lower than an RTT. This is possible in TN. Nokia agrees

- Samsung thinks we can extend the values but also fine with the scaling factor

- Intel and Interdigital are fine with the compromise

- CATT, ZTE and LGE think we can have a simpler solution and let the NW choose the value from a (new) range.

* Extend the timer length of sr-ProhibitTimer (FFS on the details)

Agreements:

1. Legacy mechanism for RA type selection based on RSRP threshold is the baseline for NTN. Optimizations can still be suggested, showing the gain (in any case, any method needs to be combined with RSRP based approach)
2. Reuse legacy RA type switching mechanism
3. Extend the timer length of sr-ProhibitTimer (FFS on the details)

[R2-2102738](file:///C:\Data\3GPP\Extracts\R2-2102738%20-%20Discussion%20on%20the%20left%20RACH%20issues%20in%20NTN.doc) Discussion on the left RACH issues in NTN OPPO discussion Rel-17 NR\_NTN\_solutions-Core

* TA pre-compensation and timers for RACH procedure

Observation 1 If gNB does not compensate the entire feeder link’s delay, gNB needs to broadcast a common TA for TA compensation at UE.

Observation 2 The broadcasted common TA (if any) should be equal to the feeder link’s delay minus the TA compensated at gNB (if any).

Observation 3 In NGSO case, the broadcasted common TA may need to be updated frequently, which leads to frequent SI update.

Observation 4 If the current SI modification period applies to the broadcasted common TA, UEs in RRC idle or RRC inactive mode are required to wake up more often to monitor for SI change indication, which would cause the UEs to consume more power.

Observation 5 If network updates SIB frequently for the change of common TA, it might cause the SIB to be out of sync between network and UE since the value range of valueTag is not enough.

Observation 6 Whether to broadcast common TA and/or common offset and how to decide their values are up to gNB implementation, and are related to the reference point for the alignment of uplink timing and downlink timing.

Proposal 1 The common TA is broadcasted in a similar manner to that for UTC, i.e., the change of the common TA neither results in system information change notifications nor in a modification of valueTag in SIB1.

Proposal 2 For a UE with capability of TA pre-compensation, use UE-gNB RTT as the offset value to the start of ra-ResponseWindow, msgB-ResponseWindow and ra-ContentionResolutionTimer.

Proposal 3 If downlink timing and uplink timing are not aligned at gNB, gNB broadcasts a common offset corresponding to the TA value compensated by gNB.

- Xiaomi thinks RAN2 should send an LS to RAN1 on this issue.

Proposal 4 UE derives UE-gNB RTT based on both UE’s TA and common offset.

Proposal 5 Use the same broadcast mechanism for the common offset as that for the common TA.

* beamFailureRecoveryTimer

Observation 7 The current value range of beamFailureRecoveryTimer may not be sufficient to cover the time interval for multiple RACH attempts due to much larger RTT in NTN.

Observation 8 Extending the value range of beamFailureRecoveryTimer would cause large signalling overhead.

Proposal 6 If RAN1 confirms to reuse BFD and BFR procedure, RAN2 discuss following options to adapt beamFailureRecoveryTimer in NTN:

- Option 1: Extend the value range of beamFailureRecoveryTimer.

- Option 2: UE suspends beamFailureRecoveryTimer during the offset for ra-ResponseWindow or ra-ContentionResolutionTimer.

[R2-2103951](file:///C:\Data\3GPP\Extracts\R2-2103951%20-%20On%20Random%20Access%20in%20NTNs.docx) On Random Access in NTNs Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

* Pre-compensation estimation and reporting

Proposal 1 RAN2 to postpone discussions on TA estimation and offset estimation until RAN1 has concluded on this.

Observation 1 The UE reported TA can be used to accurately estimate the UE position. Reporting TA and TA drift will give a more accurate position or faster UE position acquisition.

Observation 2 Reporting TA in a MAC CE will enable any entity to estimate the UE position.

Proposal 2 The UE reporting of timing advance or position uses RRC signalling after security has been activated.

Observation 3 With the UE position and the satellite ephemeris, the gNB can predict TA variations with less signalling than the UE reporting TA and TA drift.

Proposal 3 The UE shall report its position to the gNB.

* Enhancement on UL scheduling to reduce scheduling latency

Observation 4 The purpose of the UE reporting the TA/position is for the gNB to adapt the scheduling timing to achieve lower delay for UEs that have low propagation RTT.

Observation 5 It is simpler for the gNB to dynamically adjust k0, k1, and k2 in the DCI instead of adjusting Koffset as there will be a delay and uncertainty of when a new Koffset takes effect.

Observation 6 Not all UEs in a cell and not all cells of a satellite will have a gain by adapting Koffset+k0/k1/k2 to match the propagation RTT compared to all UEs in a cell using a Koffset+k0/k1/k2 suitable for the maximum propagation RTT in the cell.

Proposal 4 If UE reporting of TA or position to the gNB is agreed, nothing further is needed for the WID objective “Enhancement on UL scheduling to reduce scheduling latency.”

* uplink and downlink relative timing

Observation 7 If UE estimation of TA is not accurate, or if RTT changes before the TA is used, starting ra-ContentionResolutionTimer after an offset of TA after msg3 transmission, the UE may start PDCCH monitoring too early or too late.

Observation 8 Basing the start of UE timers, for monitoring of PDCCH, on the UL timing will always risk starting the timer late or early.

Observation 9 When UL and DL timing is aligned in the gNB, basing the start of UE timers, for monitoring of PDCCH, on the DL timing is always accurate no matter what the timing difference between DL and UL at the UE.

Observation 10 Basing the start of ra-ContentionResolutionTimer on the downlink timing does not rely on the UE correctly estimating the TA and keeping it updated if the RTT drift away.

Proposal 5 Offset the start of the ra-ContentionResolutionTimer by starting it in the downlink symbol that has the same symbol number, slot number and system frame number as the first uplink symbol after the end of the Msg3 transmission.

Observation 11 For UEs without GNSS capabilities, using an offset of TA after msg1 transmission to start ra-ResponseWindow, may create msg3 collisions.

Proposal 6 From RAN2 perspective, the start of ra-ResponseWindow can be made in the first PDCCH occasion after the downlink symbol that has the same symbol number, slot number and system frame number as the last uplink symbol of the PRACH occasion where msg1 was transmitted.

Proposal 7 From RAN2 perspective, the start of msgB-ResponseWindow can be made in the first PDCCH occasion after the downlink symbol that has the same symbol number, slot number and system frame number as the last uplink symbol of the PUSCH transmission of MsgA.

Proposal 8 No further RAN2 solutions for resolving preamble ambiguity are needed.

Proposal 9 No further RAN2 solutions for “Adaptation for Msg-3 scheduling” are needed.

* [AT113bis-e][103][NTN] RACH aspects (Oppo)

Initial scope: Continue the discussion on the following aspects:

1. TA pre-compensation estimation aspects, including whether any question needs to be asked to RAN1 or any RAN2 working assumptions needs to be conveyed to RAN1
2. Reporting (what and when needs to be reported, and how - e.g. MAC CE vs RRC)
3. Timers for RACH procedure

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Initial deadline (for companies' feedback): Wednesday 2021-04-14 22:00 UTC

Initial deadline (for rapporteur's summary in R2-2104362): Thursday 2021-04-15 02:00 UTC

Final scope: Discuss a revision of proposals from [R2-2104362](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104362.zip), apart from p3

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Monday 2021-04-19 16:00 UTC

Initial deadline (for rapporteur's summary in R2-2104370): Monday 2021-04-19 18:00 UTC

Proposals marked "for agreement" in R2-2104370 not challenged until Tuesday 2021-04-20 08:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue offline in the Tuesday CB session

[R2-2104362](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104362.zip) Summary of offline 103 - [NTN] RACH aspects - first round Oppo discussion NR\_NTN\_solutions-Core

Proposals for easy agreements:

Proposal 1: (23/24) RAN2 assumes that in some NGSO network, common TA value which is used for TA pre-compensation, if broadcasted by the network, might change frequently over time.

* continue in a second round of [103]

Proposal 2: RAN2 postpone the discussion on how to broadcast common TA until RAN1 concludes on the drift rate.

* continue in a second round of [103]

Proposal 7: (22/24) UE-gNB RTT is used as the offset value to the start of ra-ResponseWindow, msgB-ResponseWindow and ra-ContentionResolutionTimer.

* continue in a second round of [103]

Proposal 8: RAN2 wait for RAN1’s feedback on UE obtaining UE-gNB RTT.

* Agreed

Agreements:

1. RAN2 wait for RAN1’s feedback on UE obtaining UE-gNB RTT.

Proposals for further discussion:

Proposal 3: RAN2 send an LS to RAN1, focusing on below aspects:

(1) Ask RAN1 to prioritize the TA pre-compensation work on, e.g. TA granularity, whether or what to broadcast for common TA, and if broadcasted, how often the broadcasted parameters are expected to change over time;

(2) RAN2 has agreed to use UE-gNB RTT as the offset to start some UP timers (e.g. drx-HARQ-RTT-TimerDL). Ask RAN1 to provide input on how UE acquires UE-gNB RTT and what additional information needs to be broadcasted other than that for TA pre-compensation.

Proposal 4: (14/24) UE reports finer TA value. UE specific RTT or User specific TA (NTA, UE-specific as defined by RAN1 for MsgA/Msg1 transmission), and the exact information (e.g. size) depends on RAN1 outcome.

Proposal 5: RAN2 further discuss below options to trigger TA reporting during RACH procedure.

Option 1: TA report can be triggered when RACH is initiated, and whether TA report is included in MSG3/MSG5/MSGA/next UL Grant following MSGB depends on existing LCP procedure;

Option 2: Whether UE reports UE-calculated TA to NW and in which message (e.g. MSG3/MSG5/MSGA/next UL Grant following MSGB) the report should be included should only be controlled by NW.

Proposal 6: (16/24) Use MAC CE to carry TA report during RACH procedure.

* For all the proposals the discussion will continue in a second round of [103]

R2-2104370 Summary of offline 103 - [NTN] RACH aspects - second round Oppo discussion NR\_NTN\_solutions-Core

[R2-2102932](file:///C:\Data\3GPP\Extracts\R2-2102932.docx) Considerations on RACH procedure enhancements in NTN CAICT discussion

[R2-2103053](file:///C:\Data\3GPP\Extracts\R2-2103053.doc) Start offset for RAR window and contention resolution timer Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core [R2-2100740](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100740.zip)

[R2-2103074](file:///C:\Data\3GPP\Extracts\R2-2103074_For8.10.2.1_TimingCompensation_4StepRA_RAResourceSelection_Samsung.doc) Timing Compensation, 4-Step RA Enhancements, and RA Resource Selection for an NTN Samsung Research America discussion

[R2-2103261](file:///C:\Data\3GPP\Extracts\._R2-2103261%20Triggering%20of%20UE-specific%20TA%20report.docx) Triggering of UE-specific TA report Asia Pacific Telecom co. Ltd, FGI discussion

[R2-2103263](file:///C:\Data\3GPP\Extracts\._R2-2103263%20BSR%20over%202-step%20RACH.docx) BSR over 2-step RACH Asia Pacific Telecom co. Ltd, FGI discussion

[R2-2103406](file:///C:\Data\3GPP\Extracts\R2-2103406%20Considerations%20on%20TA%20pre-compensation%20capability%20for%20RACH%20in%20NTN%20(Revision%20of%20R2-2101126).docx) Considerations on TA pre-compensation capability for RACH in NTN Lenovo, Motorola Mobility discussion Rel-17

[R2-2103407](file:///C:\Data\3GPP\Extracts\R2-2103407%20Further%20clarification%20and%20consideration%20for%20RA%20type%20selection.docx) Further clarification and consideration for RA type selection Lenovo, Motorola Mobility discussion Rel-17

[R2-2103460](file:///C:\Data\3GPP\Extracts\R2-2103460%20BSR%20over%202-step%20RA.doc) BSR over 2-step RA ASUSTeK discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104141](file:///C:\Data\3GPP\Extracts\R2-2104141_Discussion%20on%20RA%20type%20selection%20and%20TA%20report.docx) Discussion on RA type selection and TA report LG Electronics Inc. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104146](file:///C:\Data\3GPP\Extracts\R2-2104146%20NTN%202-step%20RACH%20selection%20enhancements.docx) NTN 2-step RACH selection enhancements Convida Wireless discussion

[R2-2104190](file:///C:\Data\3GPP\Extracts\R2-2104190%20Considerations%20on%20Random%20Access%20and%20TA.doc) Consideration on Random Access and TA ZTE Corporation, Sanechips discussion Rel-17

moved here from 8.10.1

[R2-2103839](file:///C:\Data\3GPP\Extracts\._R2-2103839%20Considerations%20for%20RA%20Type%20and%20TA%20Timer%20MAC%20enhancements%20in%20Non%20Terrestrial%20Networks.docx) Considerations for RA Type and TA Timer MAC Enhancements in Non Terrestrial Networks Apple discussion NR\_NTN\_solutions-Core

#### 8.10.2.2 Other MAC aspects

No company inputs expected on aspects covered by [POST113-e][106]

[R2-2103950](file:///C:\Data\3GPP\Extracts\R2-2103950%20-%20On%20scheduling%20HARQ%20and%20DRX%20for%20NTNs.docx) On scheduling, HARQ, and DRX for NTNs Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

Observation 1 There is no HARQ feedback for uplink transmissions in Rel-15 NR.

Observation 2 The UL HARQ feedback for NR-U is controlled by gNB and gNB may select not to send it, if sent it can be used to get retransmissions or new transmissions on a HP ID configured for configured grants.

Proposal 1 The RAN2 WID objective “Enabling / disabling of HARQ feedback as described in the TR 38.821 [RAN1&2]” has been met.

Observation 3 The UE shall always follow the received grants and assignments as in legacy.

Observation 4 Disabling uplink HARQ retransmissions cannot mean that the UE can ignore a received grant

Proposal 2 There is no support in the WID for “disable uplink HARQ retransmissions”. RAN2 will not further study solutions for enabling/disabling uplink HARQ retransmissions.

Proposal 3 In NTNs functionality from NR Rel-15 support scheduling the UL continuously without using all HARQ processes available in TNs by reusing HARQ process IDs after one slot.

Proposal 4 While drx-HARQ-RTT-TimerUL is running for an HARQ process, the UE can expect grants for new transmissions or retransmissions for that HARQ process.

Proposal 5 In NTNs functionality from NR Rel-15 support scheduling the DL continuously without using all HARQ processes available in TNs by reusing HARQ process IDs after a time period corresponding to the TN time between receiving a DL PDSCH until after transmitting the HARQ feedback.

Observation 5 When DL HARQ feedback is disabled, the gNB can reuse a HARQ process X after the end of the PDSCH transmission.

Proposal 6 While drx-HARQ-RTT-TimerDL is running for an HARQ process, the UE can expect assignments for new transmissions or retransmissions for that HARQ process.

Proposal 7 Further methods for blind retransmission for HARQ processes with HARQ feedback disabled are not needed.

Observation 6 In legacy, UL HARQ failure can happen.

Observation 7 There is no uplink data that always require HARQ retransmissions.

Observation 8 Changing the LCP procedure to restrict LCHs using HP IDs with or without retransmissions will incur delay and possibly require new type of SRs for LCHs blocked in LCP.

Observation 9 Using an uplink HARQ process of wrong HP ID type will be a rare event as gNB can estimate what data the UE has in its buffer from SRs, BSRs and decoded received data.

Observation 10 If UL decoding fails, gNB implementation can proactively send an RLC status report to trigger early RLC retransmission.

Observation 11 Block errors when scheduling data without retransmissions will be rare, thus not using retransmission for important data will likely not lead to failed transmissions.

Observation 12 When scheduling data without retransmission, gNB can detect and adapt scheduling and/or link adaptation and/or the estimation of the UE buffer status.

Observation 13 Legacy parameters allow reserving a certain type of grant for some LCHs and to control the QoS of each LCH.

Proposal 8 The logical channel prioritization is not updated for NTNs.

Observation 14 Using the value zero for drx-HARQ-RTT-TimerUL and drx-RetransmissionTimerUL will not increase delay in LEO scenarios and will on rare occasions give a small relative delay increase in GEO scenarios.

Proposal 9 The drx-HARQ-RTT-TimerUL is not differentiated based on if retransmissions are used for a HARQ process.

Observation 15 Splitting uplink HARQ processes in two groups limits gNB scheduling flexibility and may incur increased delay at the end of a data burst. It also leads to signalling overhead for configuring and manage the two groups.

[R2-2103230](file:///C:\Data\3GPP\Extracts\R2-2103230%20On%20DRX%20and%20LCP%20impact%20for%20NTN.docx) On DRX and LCP impact for NTN Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_NTN\_solutions-Core

Observation 3: Different retransmission scheme for UL HARQ processes may result in different performance of each HARQ process.

Observation 4: The gNB need to determine whether to use transmission scheme such as blind retransmission before the decoding failure, to guarantee service with high reliability and low latency.

Observation 5 If the LCHs /service with different retransmissions schemes requirements multiplexed into one MAC PDU, it will reduce the transmission efficiency.

Observation 6: Reusing legacy limitation in LCP procedure for NTN UL retransmission will bring the complexity for the specification.

Observation 7: LCP mapping restriction between LCH and HARQ process will not cause scheduling delay with priority based multiplexing solution.

Proposal 3: HARQ related LCP restriction can be considered when gNB supports different retransmission scheme in UL, to satisfy different services (logical channels) requirements in one NTN UE.

Proposal 4: UE should have knowledge of LCH's preferred retransmission scheme (according to LCH's service requirement) and different HARQ process retransmission scheme (provided by gNB scheduling), to facilitate LCP to restrict LCH mapping to TBS of HARQ process.

Proposal 5: RAN2 to decide signalling from NW to UE, to support LCP mapping restriction between LCH and HARQ process with two candidate options.

• Option 2.3-1: gNB indicates each HARQ's retransmission schemes, together with each LCH’s preferred retransmission scheme to UE via RRC.

• Option 2.3-2: gNB indicates each LCH's association with one or multiple HARQ processes to UE via RRC

[R2-2103054](file:///C:\Data\3GPP\Extracts\R2-2103054.doc) Support of dynamic disabling of UL HARQ retransmission Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core [R2-2100741](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100741.zip)

Observation 1. For certain traffic or data type, UE wants to use HARQ process for which there is assurance that network performs UL HARQ retransmission if it does not decode PUSCH, i.e., does not disable retransmission dynamically.

Observation 2. gNB may have no idea what traffic or data type was being transmitted in the PUSCH. In such case, disabling HARQ retransmission dynamically is an issue.

Observation 3. UE needs to know which HARQ processes are/ are not subject to dynamic disabling of retransmission.

Proposal 1 Whether a HARQ process supports disabling of HARQ retransmission dynamically is configured by RRC.

Proposal 2 Logical channel is configured with a flag indicating whether it can use the UL HARQ process that supports dynamic disabling of HARQ retransmission.

[R2-2104191](file:///C:\Data\3GPP\Extracts\R2-2104191%20Considerations%20on%20HARQ%20in%20NTN.doc) Consideration on HARQ aspects ZTE Corporation, Sanechips discussion Rel-17

Proposal 1: It is proposed that UE reuse current mechanism (e.g., based on the NDI indication) to determine whether to flush HARQ buffer or not in NTN.

Proposal 2: Current LCP restrictions (e.g., allowedPHY-PriorityIndex, allowedCG-List . ) can be reused to prevent LCHs requires fast (re)transmission and slow (re)transmission to be mapped into the same HARQ process, no enhancement is needed for LCP in NTN.

Proposal 3: NW can set drx-HARQ-RTT-TimerUL to zero according to its decision, to allow scheduling of a subsequent UL (re)transmission without waiting for decoding results of previous PUSCH transmission of the same HARQ process.

Proposal 4: No need to introduce semi-static method to disable HARQ UL retransmission.

* [AT113bis-e][104][NTN] Other MAC aspects (Ericsson)

Initial scope: Continue the discussion on Scheduling, HARQ, and DRX (e.g. based on aspects covered up to Section 2.4 in [R2-2103950](file:///C:\Data\3GPP\Extracts\R2-2103950%20-%20On%20scheduling%20HARQ%20and%20DRX%20for%20NTNs.docx))

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Initial deadline (for companies' feedback): Wednesday 2021-04-14 18:00 UTC

Initial deadline (for rapporteur's summary in R2-2104363): Wednesday 2021-04-14 22:00 UTC

Final scope: Discuss a revision of proposals from [R2-2104363](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104363.zip)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Friday 2021-04-16 06:00 UTC

Final deadline (for rapporteur's summary in [R2-2104369](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104369.zip)): Friday 2021-04-16 10:00 UTC

Proposals marked "for agreement" in [R2-2104369](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104369.zip) not challenged until Monday 2021-04-19 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Monday CB session.

[R2-2104363](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104363.zip) Summary of offline 104 - [NTN] Other MAC aspects - first round Ericsson discussion NR\_NTN\_solutions-Core

Proposal 1 RAN2 confirm that in NTNs using the Koffset and TA pre-compensation defined by RAN1, a single UE can be continuously scheduled with UL grants where NDI is toggled or not toggled according to NW strategy and avoiding HARQ stalling.

Proposal 2 RAN2 confirm that in NTNs using the Koffset and TA pre-compensation defined by RAN1 and enabled DL HARQ feedback, a single UE can be continuously scheduled with DL assignments where NDI is toggled or not toggled according to NW strategy and avoiding HARQ stalling.

Proposal 3 RAN2 confirm that in NTNs using the Koffset and TA pre-compensation and X defined by RAN1 and disabled DL HARQ feedback, a single UE can be continuously scheduled with DL assignments where NDI is toggled or not toggled according to NW strategy and avoiding HARQ stalling

Proposal 4 RAN2 confirm that if the UE is in DRX Active Time for any reason, the UE should monitor the PDCCH no matter running or not running of drx-HARQ-RTT-TimerUL, drx-HARQ-RTT-TimerDL, drx-RetransmissionTimerUL, and drx-RetransmissionTimerDL.

Proposal 5 Blind retransmissions need further discussions.

Proposal 6 RAN2 confirm that using the value zero for drx-HARQ-RTT-TimerUL and drx-RetransmissionTimerUL is possible.

Proposal 7 The drx-HARQ-RTT-TimerUL can be differentiated based on if retransmissions are enabled or disabled for an HARQ process.

Proposal 8 Changes to LCP is for further studies.

Proposal 12 There shall be configuration for “enabling/disabling uplink HARQ retransmissions” per HARQ process, configuration per LCH is FFS.

* For all the proposals the discussion will continue in a second round of [104]

[R2-2104369](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104369.zip) Summary of offline 104 - [NTN] Other MAC aspects - second round Ericsson discussion NR\_NTN\_solutions-Core

Proposals for email agreement

Ph2 Proposal 1 It is NW scheduling strategy to avoid NTN UE in HARQ stalling state. The NW can continuously schedule the UE using one or a combination of scheduling strategies, such as HARQ processes without HARQ retransmissions, or HARQ processes with blind retransmissions, or HARQ processes with HARQ retransmissions based on DL HARQ feedback (or UL decoding result).

Ph2 Proposal 7 The drx-HARQ-RTT-TimerUL is configured per UE and behaviour can be configured per HARQ process. FFS the different behaviours and how to indicate behaviour to the UE and what granularity of behaviours (two behaviour, or more) (without linking this to whether UL HARQ retransmissions are enabled or disabled at this stage)

Ph2 Proposal 8 LCP restrictions should be further considered for an UL HARQ process in NTN. FFS if no further LCP restrictions is needed, or if (R16) existing LCP restrictions can be re-used or if new LCP restriction shall be defined for this purpose.

* No proposal is agreed via email and the discussion will continue online based on the revised proposals below (PxA and PxB)

Proposals for online discussion

Ph2 Proposal 4 RAN2 confirm that in NTN if the UE is in DRX Active Time for any reason, the UE should monitor the PDCCH no matter running or not running of drx-HARQ-RTT-TimerUL and drx-HARQ-RTT-TimerDL. No specification change needed.

Ph2 Proposal 6 RAN2 confirm that using the value zero for drx-HARQ-RTT-TimerUL and drx-RetransmissionTimerUL is possible. No specification change needed.

* The discussion will continue online based on the revised proposals below (PxA and PxB)

New proposals for online discussion:

P1A: It is NW scheduling strategy to avoid NTN UE in HARQ stalling state. From RAN2 perspective, the NW can continuously schedule the UE using one or a combination of scheduling strategies, such as HARQ processes without HARQ retransmissions, or HARQ processes with blind retransmissions, or HARQ processes with HARQ retransmissions based on DL HARQ feedback (or UL decoding result).

vs

P1B: It is NW scheduling strategy to avoid NTN UE in HARQ stalling state. From RAN2 perspective, the NW can continuously schedule the UE using a number of HARQ processes and one or a combination of scheduling strategies for each HARQ process, such as without HARQ retransmissions, or with blind retransmissions, or with HARQ retransmissions based on DL HARQ feedback (or UL decoding result).

- QC supports P1A

- Huawei thinks we don't need to capture too many details

- ZTE shares the view with Ericsson (supporting P1B)

* It is NW scheduling strategy to avoid NTN UE in HARQ stalling state. From RAN2 perspective, the NW can continuously schedule the UE using one or a combination of scheduling strategies, such as without HARQ retransmissions, or with blind retransmissions, or with HARQ retransmissions based on DL HARQ feedback (or UL decoding result).

P4A: RAN2 confirms that in NTN if the UE is in DRX Active Time for any reason, the UE should monitor the PDCCH regardless of whether drx-HARQ-RTT-TimerUL or drx-HARQ-RTT-TimerDL is running or not. No specification change is needed.

* Agreed (not a new proposal, only a confirmation of what is already possible)

P6A: RAN2 confirms that in NTN using the value= “zero” for drx-HARQ-RTT-TimerUL and drx-RetransmissionTimerUL is possible. No specification change is needed.

* Agreed (not a new proposal, only a confirmation of what is already possible)

P7B: In NTN, The drx-HARQ-RTT-TimerUL is configured per UE DRX group and the behaviour can be configured per HARQ process. FFS the different behaviours and how to indicate the behaviour to the UE and the number of behaviours (e.g., two or more behaviours).

- Nokia is not sure this should be per HARQ process

* Agreed

P8B: LCP restrictions should be further considered for an UL HARQ process in NTN. FFS if no further LCP restrictions are needed, or if (R16) existing LCP restrictions can be re-used or if new LCP restriction shall be defined for this purpose.

* Agreed

Agreements:

1. It is NW scheduling strategy to avoid NTN UE in HARQ stalling state. From RAN2 perspective, the NW can continuously schedule the UE using one or a combination of scheduling strategies, such as without HARQ retransmissions, or with blind retransmissions, or with HARQ retransmissions based on DL HARQ feedback (or UL decoding result).
2. RAN2 confirms that in NTN if the UE is in DRX Active Time for any reason, the UE should monitor the PDCCH regardless of whether drx-HARQ-RTT-TimerUL or drx-HARQ-RTT-TimerDL is running or not. No specification change is needed.
3. RAN2 confirms that in NTN using the value= “zero” for drx-HARQ-RTT-TimerUL and drx-RetransmissionTimerUL is possible. No specification change is needed.

4. In NTN, The drx-HARQ-RTT-TimerUL is configured per UE DRX group and the behaviour can be configured per HARQ process. FFS the different behaviours and how to indicate the behaviour to the UE and the number of behaviours (e.g., two or more behaviours).

5. LCP restrictions should be further considered for an UL HARQ process in NTN. FFS if no further LCP restrictions are needed, or if (R16) existing LCP restrictions can be re-used or if new LCP restriction shall be defined for this purpose.

[R2-2102739](file:///C:\Data\3GPP\Extracts\R2-2102739%20-%20Discussion%20on%20HARQ%20impact%20in%20NTN.doc) Discussion on HARQ impact in NTN OPPO discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2102823](file:///C:\Data\3GPP\Extracts\R2-2102823%20Round%20trip%20delay%20offset%20for%20configured%20grant%20timer_v1.docx) Round trip delay offset for configured grant timers MediaTek Inc. discussion [R2-2100262](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100262.zip)

[R2-2102824](file:///C:\Data\3GPP\Extracts\R2-2102824%20On%20Disabling%20uplink%20HARQ%20retransmission%20and%20Associated%20LCP%20Impacts_v1.docx) On disabling uplink HARQ retransmission and associated LCP impacts MediaTek Inc. discussion [R2-2100261](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100261.zip)

[R2-2102951](file:///C:\Data\3GPP\Extracts\R2-2102951%20Discussion%20on%20UL%20Scheduling%20Enhancements%20in%20NR%20NTN.docx) Discussion on UL Scheduling Enhancements in NR NTN CATT discussion

[R2-2102952](file:///C:\Data\3GPP\Extracts\R2-2102952%20Discussion%20on%20HARQ%20Aspects%20in%20NTN.docx) Discussion on HARQ Aspects in NTN CATT discussion

[R2-2103075](file:///C:\Data\3GPP\Extracts\R2-2103075_For8.10.2.2_HARQStalling_RNTI_ULScheduling_LCP_Samsung.doc) HARQ Stalling, RNTI Enhancements, Enhanced UL Scheduling, and Logical Channel Prioritization for an NTN Samsung Research America discussion

[R2-2103175](file:///C:\Data\3GPP\Extracts\R2-2103175%20HARQ%20related%20issues.doc) HARQ related issues Beijing Xiaomi Mobile Software discussion Rel-17 [R2-2100179](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100179.zip)

[R2-2103232](file:///C:\Data\3GPP\Extracts\R2-2103232%20Discussion%20on%20UL%20scheduling%20enhancements%20for%20NTN.docx) Discussion on UL scheduling enhancements for NTN Nokia, Nokia Shanghai Bell discussion NR\_NTN\_solutions-Core

[R2-2103262](file:///C:\Data\3GPP\Extracts\._R2-2103262%20HARQ%20retransmission%20schemes%20in%20NTN.docx) HARQ retransmission schemes in NTN Asia Pacific Telecom co. Ltd, FGI discussion

[R2-2103445](file:///C:\Data\3GPP\Extracts\R2-2103445%20Discussion%20on%20Co-existence%20issue%20of%20BSR%20over%20CG%20and%20BSR%20over%202-step%20RACH.docx) Co-existence issue of BSR over CG and BSR over 2-step RACH PANASONIC R&D Center Germany discussion

[R2-2103446](file:///C:\Data\3GPP\Extracts\R2-2103446%20DRX%20impact%20of%20disabling%20HARQ%20feedback%20and%20uplink%20retransmission.docx) DRX impact of disabling HARQ feedback and uplink retransmission PANASONIC R&D Center Germany discussion

[R2-2103599](file:///C:\Data\3GPP\Extracts\R2-2103599.doc) Other MAC enhancements in NTN Sony Europe B.V. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103629](file:///C:\Data\3GPP\Extracts\R2-2103629%20Further%20consideration%20on%20HARQ%20and%20LCP%20in%20NTN.DOC) Further consideration on HARQ and LCP in NTN Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103725](file:///C:\Data\3GPP\Extracts\R2-2103725%20Left%20Issues%20for%20HARQ%20operation%20in%20NTN.docx) Left Issues for HARQ operation in NTN CMCC discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103826](file:///C:\Data\3GPP\Extracts\R2-2103826_TA%20Adjustment%20in%20RRC_CONNECTED%20state.docx) TA Adjustment in RRC\_CONNECTED state NEC Telecom MODUS Ltd. discussion

[R2-2103967](file:///C:\Data\3GPP\Extracts\R2-2103967%20(R17%20NTN%20WI%20AI%208.10.2.2)%20UL%20HARQ%20RTT%20Timer.docx) UL HARQ RTT timer in NTN InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104038](file:///C:\Data\3GPP\Extracts\R2-2104038.docx) Discussion on MAC timers about UL scheduling in NTN CAICT discussion

[R2-2104144](file:///C:\Data\3GPP\Extracts\R2-2104144_Discussion%20on%20UL%20scheulding%20and%20UL%20retranmission.DOCX) Discussion on UL scheulding and UL retranmission LG Electronics Inc. discussion Rel-17 NR\_NTN\_solutions-Core

#### 8.10.2.3 RLC and PDCP aspects

No company inputs expected for this agenda item. Only the outcome of [POST113-e][107][NTN] RLC and PDCP aspects (Samsung) will be treated.

[R2-2104286](file:///C:\Data\3GPP\Extracts\R2-2104286%20report%20of%20%5bPOST113-e%5d%5b107%5d%5bNTN%5d%20RLC%20and%20PDCP%20Aspects%20(Samsung)_v21_UpdatedSummary.docx) Report of [POST113-e][107][NTN] RLC and PDCP Aspects (Samsung) Samsung discussion

* Revised in [R2-2104499](file:///C:\Data\3GPP\RAN2\Docs\R2-2104499.zip)

[R2-2104499](file:///C:\Data\3GPP\RAN2\Docs\R2-2104499.zip) Report of [POST113-e][107][NTN] RLC and PDCP Aspects (Samsung) Samsung discussion

* Proposals with Unanimous or Near-Unanimous Agreement

Proposal P1. The UE utilizes the t-Reassembly timer value that does not depend on the time-varying UE-gNB delay.

* Agreed

Proposal P2A. The value range of t-Reassembly shall be extended. The following set of values are possibly added for t-Reassembly timer: {ms210, ms220, ms340, ms350, ms550, ms1100, ms1650, ms2200}. Any other values are FFS.

- Ericsson thinks all the timers could be extended by a common RRC configured value. Samsung agrees the using the same framework would be better but it seems that this was not the majority view.

* Agreed

Proposal P4A. The network can configure the values of PDCP discardTimer and PDCP t-Reordering timer greater than the RLC t-Reassembly timer.

* Agreed. The network can configure the values of PDCP discardTimer and PDCP t-Reordering timer greater than the RLC t-Reassembly timer.

[Rapporteur’s note on P4A. If the existing values of PDCP discardTimer and PDCP t-Reordering timer are not adequate to accommodate finalized extended RLC t-Reassembly timer values, RAN2 would need to extend PDCP discardTimer and PDCP t-Reordering timer values.]

* Proposals with Potential Agreement

Proposal P5. If SA2 updates the QoS requirements for the NTN, consider extending the range of the PDCP discardTimer and the PDCP t-reordering timer. One option is to enlarge the set of allowed values for the PDCP discardTimer and the PDCP t-reordering timer. The exact values FFS.

* Extend the range of the PDCP discardTimer and the PDCP t-reordering timer. One option is to enlarge the set of allowed values for the PDCP discardTimer and the PDCP t-reordering timer. The exact values FFS

[New Proposal P6A and Proposal 7 are based the original P6 and email feedback. This proposal has not been discussed]

Proposal P6A. Wait for SA2 to update the QoS requirements for the NTN before discussing the topic of “extending the PDCP discardTimer and the PDCP t-reordering timer.”

Proposal 7. Consider NTN-specific updated RLC t-Reassembly timer values and SA2 QoS requirements together to determine the need for extending the PDCP discardTimer and the PDCP t-reordering timer.

Proposal X. Postpone decision making on whether RAN2 should discuss the issues of (1) RLC STATUS reports for long RLC t-Reassembly timer values and (2) frequent SR triggering for short RLC t-Reassembly timer values or not until another email discussion on overall RLC/PDCP issues takes place.

- ZTE thinks only one company thinks there is an issue. We don't need to further discuss this. Huawei share the same view. LGE agrees. Furthermore in case this could also apply to TN so it can be discussed as TEIx. Mediatek agrees.

* Contributions can be submitted but there will be no email discussion on this at this stage.

Agreements:

1. The UE utilizes the t-Reassembly timer value that does not depend on the time-varying UE-gNB delay.
2. The value range of t-Reassembly shall be extended. The following set of values are possibly added for t-Reassembly timer: {ms210, ms220, ms340, ms350, ms550, ms1100, ms1650, ms2200}. Any other values are FFS.
3. The network can configure the values of PDCP discardTimer and PDCP t-Reordering timer greater than the RLC t-Reassembly timer.
4. Extend the range of the PDCP discardTimer and the PDCP t-reordering timer. One option is to enlarge the set of allowed values for the PDCP discardTimer and the PDCP t-reordering timer. The exact values FFS

[R2-2103827](file:///C:\Data\3GPP\Extracts\R2-2103827_RLC%20t-Reassembly%20timer%20configuration.docx) RLC t-Reassembly timer configuration NEC Telecom MODUS Ltd. discussion

[R2-2103964](file:///C:\Data\3GPP\Extracts\R2-2103964_On%20RLC%20t-Reassembly%20for%20NTN.docx) On RLC t-Reassembly for NTN Sequans Communications discussion Rel-17 NR\_NTN\_solutions-Core [R2-2101518](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2101518.zip)

### 8.10.3 Control Plane

#### 8.10.3.1 Earth fixed/moving beams related issues

Including TAC update aspects

[R2-2103628](file:///C:\Data\3GPP\Extracts\R2-2103628%20Discussion%20on%20remaining%20issues%20on%20soft%20TAU.DOC) Discussion on remaining issues on soft TAU Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1: If none of the TAC included in SI belongs to the TAI list, UE triggers TAU.

- Samsung thinks that for soft TAU this would be ok, but think that we should consider the virtual TA approach instead.

- LGE agrees with p1.

- QC thinks how/when the UE triggers TAU is up to NAS, not AS. So the decision should be up to CT1.

- ZTE agrees with QC that this needs to be discussed in CT1.

- Nokia agrees with the proposal, regardless of which group decides.

- Thales thinks the virtual TA approach could be useful for Earth moving beams but not for other cases.

Proposal 2: The TAC change in SI should trigger SI change indication.

- CMCC thinks this might not be needed.

- LGE thinks the SI change indication is needed when a TAC is removed.

- QC thinks the in both the approaches the UE needs to be notified, either explicitly (HW) or implicitly (Ericsson).

- ZTE thinks the baseline is to trigger SI change notification and we should not rush into unnecessary enhancements.

- Nokia this could be left to NW implementation

* When the network stops broadcasting a TAC, the UE needs to know it (FFS on further details)

Agreements:

1. When the network stops broadcasting a TAC, the UE needs to know it (FFS on further details)

[R2-2103749](file:///C:\Data\3GPP\Extracts\R2-2103749%20NTN%20TAC.docx) Aspects concerning soft TAC switch Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1 RAN2 to agree on the use of validity timers related to TAIs

Proposal 2 RAN2 to agree that TAC update in SI does not cause paging for SI update.

Proposal 3 RAN2 to conclude RAN2 assumes UE indicates only single TAC to NAS layer.

Proposal 4 RAN2 to conclude RAN2 assumes UE uses the timing information associated to the broadcasted TAC in both when selecting which TAC to update to NAS layer as well as when performing location update.

Proposal 5 RAN2 to conclude RAN2 assumes that UE does not do location update if one of the currently broadcasted TAC belongs to UEs registration area.

Proposal 6 RAN2 to send LS to CT1 preferably informing about the conclusion in RAN2 or by presenting options RAN2 discussed and ask for feedback.

Proposal 7 SA2 and RAN3 should be added as cc in the LS.

* [AT113bis-e][105][NTN] TAC update (Huawei)

Initial scope: Continue the discussion on based on the proposals from [R2-2103628](file:///C:\Data\3GPP\Extracts\R2-2103628%20Discussion%20on%20remaining%20issues%20on%20soft%20TAU.DOC), [R2-2103749](file:///C:\Data\3GPP\Extracts\R2-2103749%20NTN%20TAC.docx) and [R2-2103076](file:///C:\Data\3GPP\Extracts\R2-2103076_For8.10.3.1_TAC_Management_NeighborSearch_Samsung.doc), including the need to send an LS to SA2 and/or CT1

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Initial deadline (for companies' feedback): Wednesday 2021-04-14 22:00 UTC

Initial deadline (for rapporteur's summary in R2-2104364): Thursday 2021-04-15 02:00 UTC

Final scope: Discuss a revision of proposals from [R2-2104364](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104364.zip)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Monday 2021-04-19 15:00 UTC

Final deadline (for rapporteur's summary in R2-2104371): Monday 2021-04-19 17:00 UTC

Proposals marked "for agreement" in R2-2104371 not challenged until Tuesday 2021-04-20 08:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Tuesday CB session

[R2-2104364](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104364.zip) Summary of offline 105 - [NTN] TAC update - first round Huawei discussion NR\_NTN\_solutions-Core

List of proposals for agreement:

(21/25)Proposal 1: When the network stops broadcasting a TAC, network can send a SI change indication like legacy to make UE aware of it. Whether and when to send a SI change indication still depends on network implementation. FFS on further enhancement to lower paging signaling overhead.

* continue in a second round of [105]

(22/25)Proposal 2: AS indicates all received TACs to NAS layer when more than one TAC per PLMN is broadcasted in NTN cell.

* continue in a second round of [105]

(24/25)Proposal 3: RAN2 assume UE does not do TAU if one of the currently broadcasted TAC belongs to UE’s registration area.

* Agreed

(21/25)Proposal 4: RAN2 to send a LS to CT1 and CC RAN3 and SA2 to inform them of RAN2’s agreements that affect NAS.

* continue in a second round of [105]

(19/25)Proposal 5: Virtual Tracking Area solution is not considered in R17 NR NTN WI.

* continue in a second round of [105]

Agreements:

1. RAN2 assume UE does not do TAU if one of the currently broadcasted TAC belongs to UE’s registration area.

R2-2104371 Summary of offline 105 - [NTN] TAC update - second round Huawei discussion NR\_NTN\_solutions-Core

[R2-2103055](file:///C:\Data\3GPP\Extracts\R2-2103055.doc) TAC update procedure Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2102740](file:///C:\Data\3GPP\Extracts\R2-2102740%20TAC%20update.doc) Discussion on TAC update OPPO discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2102990](file:///C:\Data\3GPP\Extracts\R2-2102990%20Issues%20on%20the%20TAC%20update%20due%20to%20satellite%20movement.docx) Issues on the TAC update due to satellite movement PANASONIC R&D Center Germany discussion

[R2-2103008](file:///C:\Data\3GPP\Extracts\R2-2103008.docx) Signalling Solution for Feeder Link Switching of NTN VODAFONE Group Plc discussion

[R2-2103076](file:///C:\Data\3GPP\Extracts\R2-2103076_For8.10.3.1_TAC_Management_NeighborSearch_Samsung.doc) TAC Management and Neighbor Search in an NTN Samsung Research America discussion

[R2-2103134](file:///C:\Data\3GPP\Extracts\R2-2103134%20Discussion%20on%20TAC%20aspects%20for%20NTN.doc) Discussion on TAC aspects for NTN Xiaomi discussion

[R2-2103244](file:///C:\Data\3GPP\Extracts\R2-2103244%20%20Discussion%20on%20TAC%20updating%20in%20NTN.doc) Discussion on TAC updating in NTN Spreadtrum Communications discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103307](file:///C:\Data\3GPP\Extracts\R2-2103307%20Contents%20of%20ephemeris%20including%20beam%20type%20information.doc) Contents of ephemeris including beam type information LG Electronics Inc. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103334](file:///C:\Data\3GPP\Extracts\R2-2103334%20On%20Feeder%20Link%20Mobility%20in%20Transparent%20Satellite%20Payload%20Scenarios.docx) On Feeder Link Mobility in Transparent Satellite Payload Scenarios Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_NTN\_solutions-Core [R2-2100528](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100528.zip)

[R2-2103699](file:///C:\Data\3GPP\Extracts\R2-2103699%20Discussion%20on%20SI%20modification%20for%20TAC%20Update.docx) Discussion on SI modification for TAC Update CMCC discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103747](file:///C:\Data\3GPP\Extracts\R2-2103747%20NTN%20Fixed%20Moving%20Beams.docx) Aspects for Earth fixed and Earth moving beams for NTN Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

R2-2103836 Analysis of Mobility Management with Earth Fixed and Earth Moving Beams/Cells in NTN Networks Apple discussion NR\_NTN\_solutions-Core Late

[R2-2103912](file:///C:\Data\3GPP\Extracts\R2-2103912_NR-NTN_Multi-TAI_Broadcast.docx) NR-NTN: Multi-TAI Broadcast Fraunhofer IIS, Fraunhofer HHI discussion

moved here from 8.10.1

[R2-2103627](file:///C:\Data\3GPP\Extracts\R2-2103627%20Discussion%20on%20decoupled%20cell%20ID.doc) Discussion on decoupled cell ID Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

#### 8.10.3.2 Idle/Inactive mode

Idle/inactive mode specific issues.

Including cell selection/reselection & system information.

This agenda item maybe deprioritized during this meeting.

[R2-2102741](file:///C:\Data\3GPP\Extracts\R2-2102741%20NTN%20Idle%20inactive%20mode%20procedures.doc) Discussion on idle/inactive mode procedures in NTN OPPO discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2102825](file:///C:\Data\3GPP\Extracts\R2-2102825_Cell-Reselection_NR-NTN_v3.0.docx) On Cell-Reselection in NR-NTN MediaTek Inc. discussion [R2-2100260](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100260.zip)

[R2-2102826](file:///C:\Data\3GPP\Extracts\R2-2102826_TAU_NR-NTN_v3.0.DOCX) On Soft-switch based Tracking Area Updates in NR-NTN MediaTek Inc. discussion

[R2-2102953](file:///C:\Data\3GPP\Extracts\R2-2102953_Leftover%20issues%20on%20IDLE%20and%20inactive%20mode.docx) Leftover issues on IDLE and inactive mode CATT discussion

[R2-2103077](file:///C:\Data\3GPP\Extracts\R2-2103077_For8.10.3.2_CellReselection_SI_Paging_Samsung.doc) Cell Reselection, System Information, and Paging Enhancements for an NTN Samsung Research America discussion

[R2-2103135](file:///C:\Data\3GPP\Extracts\R2-2103135%20Cell%20selection%20and%20reselection%20enhancements%20for%20NTN.doc) Cell selection and reselection enhancements for NTN Xiaomi discussion

[R2-2103245](file:///C:\Data\3GPP\Extracts\R2-2103245%20%20Issue%20on%20cell%20selection%20and%20reselection%20in%20NTN.doc) Issues on cell selection and reselection in NTN Spreadtrum Communications discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103408](file:///C:\Data\3GPP\Extracts\R2-2103408%20Ephemeris%20provision%20and%20network%20type%20indication%20for%20NTN.docx) Ephemeris provision and network type indication for NTN Lenovo, Motorola Mobility discussion Rel-17

[R2-2103461](file:///C:\Data\3GPP\Extracts\R2-2103461%20PLMN%20separation%20for%20NTN%20&%20TN.doc) PLMN separation for NTN & TN ASUSTeK discussion Rel-17 NR\_NTN\_solutions-Core [R2-2101755](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2101755.zip)

[R2-2103597](file:///C:\Data\3GPP\Extracts\R2-2103597.doc) Idle mode enhancement in NTN Sony Europe B.V. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103631](file:///C:\Data\3GPP\Extracts\R2-2103631%20WF%20for%20cell%20reselection%20in%20NTN.doc) WF for cell reselection in NTN Huawei, HiSilicon, BT Plc, CAICT, China Telecom discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103837](file:///C:\Data\3GPP\Extracts\._R2-2103837%20Cell%20Selection%20And%20Cell%20Reselection%20Solutions%20for%20Non%20Terrestrial%20Networks.docx) Cell Selection And Cell Reselection Solutions for Non Terrestrial Networks Apple, British Telecom discussion NR\_NTN\_solutions-Core

[R2-2103838](file:///C:\Data\3GPP\Extracts\._R2-2103838%20Considerations%20on%20ephemeris%20database%20and%20parameter%20distribution%20to%20UEs%20in%20Non%20Terrestrial%20Networks.docx) Considerations on ephemeris database and parameter distribution to UEs in Non Terrestrial Networks Apple discussion NR\_NTN\_solutions-Core

[R2-2103965](file:///C:\Data\3GPP\Extracts\R2-2103965%20(R17%20NTN%20WI%20AI%208.10.3.2)%20Cell%20reselection.docx) Cell reselection in NTN InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103966](file:///C:\Data\3GPP\Extracts\R2-2103966%20(R17%20NTN%20WI%20AI%208.10.3.2)%20Ephemeris%20in%20NTN.docx) Ephemeris in NTN InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104066](file:///C:\Data\3GPP\Extracts\R2-2104066_Further%20consideration%20on%20cell%20selection%20and%20reselection%20in%20NTN.docx) Further consideration on cell selection and reselection in NTN ZTE corporation, Sanechips discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104147](file:///C:\Data\3GPP\Extracts\R2-2104147%20NTN%20Indication.docx) NTN indication and idle mode enhancements Convida Wireless discussion

R2-2104148 NTN Cell Selection and Idle Mode Enhancements Convida Wireless discussion Withdrawn

[R2-2104149](file:///C:\Data\3GPP\Extracts\R2-2104149%20NTN%20cell%20(re)selection%20and%20Idle%20mode%20enhancements.docx) NTN Cell (re)selection and idle mode enhancements Convida Wireless discussion

[R2-2104210](file:///C:\Data\3GPP\Extracts\R2-2104210_Understanding%20on%20the%20newly%20introduced%20Access%20Technology%20identifier%20for%20NTN.docx) Understanding on the newly introduced Access Technology identifier for NTN ZTE corporation, Sanechips discussion Rel-17 NR\_NTN\_solutions-Core

#### 8.10.3.3 Connected mode

Connected mode specific issues.

Including the outcome of [POST113-e][108][NTN] SMTC and measurement gaps (Intel). No company inputs expected on aspects covered by [POST113-e][108]

SMTC and measurement gaps

[R2-2102866](file:///C:\Data\3GPP\Extracts\R2-2102866_post113-e_108_NTN_SMTC_MeasGap.docx) Report of [post113-e][108][NTN] SMTC and measurement gap Intel Corporation discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1. [To agree] [21/21] For Rel-17 NTN, Rel-17 NR operation is enhanced (e.g. the SMTC configuration and UE measurement gap configuration) aiming to address the issues associated with the different/larger propagation delays, and the satellites (considering e.g. their deployment, mobility, height, minimum elevation and prioritizing typical NTN scenarios).

* Agreed

Proposal 2. [To agree] [20/21] Rel-17 NTN will not rely only on network implementation to address the issue explained in proposal 1.

* Agreed

Proposal 3. [To agree] [19/21] Enhancements of the SMTC configuration is supported for Rel-17 NTN.

* Agreed

Proposal 3.1. [To agree] [13/21] To enable the usage one or more SMTC configuration(s) with one or more offset(s) / SMTC periodicity/duration associated to each SMTC configuration in order to account for the different propagation delays. FFS if SMTC configuration can be associated with one or more cells and/or with one or more satellites. FFS how to define the offset in relation to the propagation delay of the serving satellite and neighbor satellite(s). FFS the details on how multiple SMTC configurations work in relation to the new offsets (e.g. whether one or more offset(s) associated to each SMTC configuration).

- QC would like to add the option to have different SMTC periodicity and duration

- Nokia and Samsung do not like p3.1. Samsung would like to add timing information. Ericsson wonders where the information on timing is needed.

- ZTE is fine to consider this as an option

- Huawei thinks this is not clear as we can already support 2 SMTC configurations.

Proposal 4. [FFS] [4] FFS whether to slightly extend the lengths allowed for the SMTC window.

Proposal 5. [To agree] [13/21] From RAN2 point of view, additional SSBs are not introduced for Rel-17 NTN.

Proposal 6. [To agree] [17/21] Measurement gap window is not extended for Rel-17 NTN.

Proposal 7. [To agree] [13/21] Multiple measurement gap patterns are supported for Rel-17 NTN.

Proposal 8. [To agree] [17/21] Periodic adjustment of measurement gap is not enabled for Rel-17 NTN.

Proposal 9. [To agree] [19/21] A UE cannot update measurement gap window autonomously for Rel-17 NTN.

Proposal 10. [To agree] [19/21] Rel-17 NTN will not rely only in legacy operation for the network to configure correctly the SMTC window and the measurement gap.

Proposal 11. [To agree] [19/21] optional new UE assistance is defined in Rel-17 NTN for network to properly (re)configure the SMTC and/or measurement gap.

* Agreed. Optional new UE assistance is defined in Rel-17 NTN for network to properly (re)configure the SMTC and/or measurement gap

Proposal 12. [To discuss] [9/21] To discuss if a UE can report location information. If this reporting is agreed, FFS how UE’s location is known by UE (e.g. based on GNSS and/or RTT measurement and/or coarse location info represented by the TAC/TAI mapped from the geographical area UE); and, FFS how frequent this information is exchanged (e.g. periodically vs upon request).

Proposal 13. [To discuss] [11/21] To discuss if a UE can report propagation delay related information. If this reporting is agreed, FFS whether this information is defined as an absolute value based on propagation delay from neighboring cells or relative value based on the SFTD; and, FFS how frequent this information is exchanged (e.g. periodically vs upon request).

Proposal 14. [FFS] FFS if the following new UE reporting is defined:

Proposal 14.1. [FFS] [7] To allow a UE to report desirable adjustments on its measurement gap window based on UE’s own measurements of the propagation delay shift.

Proposal 14.2. [FFS] [5] To allow a UE to inform the network if certain PCI(s), of the ones configured in the measConfig, cannot be detected at all. This assistance information would be helpful for the network to provide an updated SMTC/gap configuration to measure the missing PCI(s).

Proposal 14.3. [FFS] [2] To allow a UE to report TA (e.g. in Msg.5).

Proposal 14.4. [FFS] [1] To allow a UE to report neighbor cell measurements.

Proposal 15. [To agree] [18/21] Rel-17 NTN will not support that UE updates SMTC window based on relative movement of neighbor cell’s SSB.

Agreements:

1. For Rel-17 NTN, Rel-17 NR operation is enhanced (e.g. the SMTC configuration and UE measurement gap onfiguration) aiming to address the issues associated with the different/larger propagation delays, and the satellites (considering e.g. their deployment, mobility, height, minimum elevation and prioritizing typical NTN scenarios).
2. Rel-17 NTN will not rely only on network implementation to address the issue explained in agreement 1.
3. Enhancements of the SMTC configuration is supported for Rel-17 NTN.
4. Optional new UE assistance is defined in Rel-17 NTN for network to properly (re)configure the SMTC and/or measurement gap

* [AT113bis-e][106][NTN] SMTC and gaps (Intel)

Initial scope: Continue the discussion on p3.1, p7 and p12 and p13 from [R2-2102866](file:///C:\Data\3GPP\Extracts\R2-2102866_post113-e_108_NTN_SMTC_MeasGap.docx).

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Initial deadline (for companies' feedback): Wednesday 2021-04-14 22:00 UTC

Initial deadline (for rapporteur's summary in R2-2104365): Thursday 2021-04-15 02:00 UTC

Final scope: Discuss a revision of proposals from [R2-2104365](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104365.zip)

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Friday 2021-04-16 08:00 UTC

Initial deadline (for rapporteur's summary in R2-2104372): Friday 2021-04-16 10:00 UTC

Proposals marked "for agreement" in R2-2104372 not challenged until Monday 2021-04-19 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue offline in the Monday CB session

[R2-2104365](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104365.zip) Summary of offline 106 - [NTN] SMTC and gaps - first round Intel discussion NR\_NTN\_solutions-Core

* For all the proposals the discussion will continue in a second round of [106]

[R2-2104372](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104372.zip) Summary of offline 106 - [NTN] SMTC and gaps - second round Intel discussion NR\_NTN\_solutions-Core

Proposals for email agreement

Proposal 1B. [To agree] [21/23] For Rel-17 NTN, one or more SMTC configuration(s) associated to one measurement frequency can be configured. FFS solution details.

* Agreed, removing "measurement"

Proposal 1C. [To agree] [1] If Proposal 1B is agreed, leave as FFS the following open questions: (a) can the UE be configured with multiple SMTCs per carrier and use them all in parallel?, (b) How the NW knows which SMTC (incl. offsets/periodicity, etc.) is relevant for a particular UE?, (c) Is there any validity: in time or for certain location only, foreseen in such multiple SMTC configuration?, (d) What is the potential impact on the signalling, assuming this delay is a dynamic value?, and (e) What about the feeder link delay? Is it considered anywhere?

* Discuss online whether this applies to all the proposals in this list

Proposal 2B. [To agree] [20/23] The SMTC configuration of Proposal 1B can be associated with a set of cells (e.g., per satellite or any other suitable set per gNB determination).

* Agreed

Proposal 4C. [To agree] [21/23] The multiple SMTC configuration of Proposal 1B is enabled by introducing different new offsets in addition to legacy SMTC configuration. FFS how the offsets will be managed/signalled.

* Agreed with the following wording: The multiple SMTC configurations of Proposal 1B are enabled by introducing different new offsets in addition to the legacy SMTC configuration. FFS how the offsets will be managed/signalled.

Proposal 7. [To agree] [16/21] The configuration of the new offset is left up to network implementation.

* Agreed with the following wording: The configuration of one or multiple offsets is left up to the network implementation.

Proposal 10. [To agree] [22/23] It is up to network to update the SMTC configuration of the UE to accommodate the different propagation delays.

* Agreed

Agreements - via email (from offline [106])

1. For Rel-17 NTN, one or more SMTC configuration(s) associated to one frequency can be configured. FFS solution details.

- The SMTC configuration can be associated with a set of cells (e.g., per satellite or any other suitable set per gNB determination).

- The multiple SMTC configurations are enabled by introducing different new offsets in addition to the legacy SMTC configuration. FFS how the offsets will be managed/signalled.

FFS the following open questions:

(a) can the UE be configured with multiple SMTCs per carrier and use them all in parallel?

(b) How the NW knows which SMTC (incl. offsets/periodicity, etc.) is relevant for a particular UE?

(c) Is there any validity: in time or for certain location only, foreseen in such multiple SMTC configuration?

(d) What is the potential impact on the signalling, assuming this delay is a dynamic value?

(e) What about the feeder link delay? Is it considered anywhere?

1. The configuration of one or multiple offsets is left up to the network implementation.
2. It is up to network to update the SMTC configuration of the UE to accommodate the different propagation delays.

Proposals for discussion (1st priority) or to be captured as FFS

Proposal 5. [To discuss] [9] Whether the multiple SMTC configuration of Proposal 1B can be enabled via different STMC periodicity/duration.B

Proposal 13. [To discuss] [16/23] To discuss from RAN2 perspective whether to support multiple measurement gap patterns to Rel-17 NTN UEs.

- Intel indicates there was good support but also objections. Huawei thinks we need more evaluations to see whether one gap is enough. Nokia thinks the SMTC discussion should converge first and then we can discuss gaps. ZTE shares the same view. Ericsson agrees

- QC thinks some enhancements are needed also for measurement gaps and we should also inform RAN4 on time. Intel agrees.

- Mediatek agrees enhancements are needed but we should not exclude other proposals (e.g. one additional gap (max 2 gaps))

* Measurement gaps enhancements should be supported. FFS on the details

Agreements online:

1. Measurement gaps enhancements should be supported. FFS on the details

Proposals for discussion (2nd priority) or to be captured as FFS

Proposal 6. [FFS] [7] If Proposal 5 is agreed, to discuss whether (or how) to combine different offsets and different SMTC periodicities/durations.

Proposal 8. [FFS] [7/20] FFS what the new offset represents”.

Proposal 9. [FFS] [6/20] Whether UE can provide new assistance information to help network when configuring the new offsets (as explained in Proposal 7).

Proposal 11. [FFS] [8/23] Whether UE can provide assistance to network to help perform the adjustment of SMTC configuration (discussed in Proposal 10).

Proposal 12. [FFS] [1] FFS on the usability (i) sharing a given SMTC configuration per set of neighbor cells and (ii) specifying time validity of SMTC configurations to avoid frequent SIB changes and frequent UE processing.

Proposal 14. [FFS] [6/23] Whether to check with RAN4 on the impact of multiple SMTC configuration and measurement gap patterns to Rel-17 NTN UEs.

Proposal 15. [FFS] [8/23] whether to define UE’s location related information as part of the new UE assistance (E.g. based on GNSS, RTT measurement, and/or coarse location information represented by the TAC/TAI mapped from the geographical area).

Proposal 16. [FFS] [13/23] whether to define UE’s propagation delay related information as part of the new UE assistance (E.g. a relative value based on the SFTD, RTT and/or absolute value of its propagation delay difference between serving and neighbor satellites, or its propagation delay to neighbor satellites).

[R2-2103057](file:///C:\Data\3GPP\Extracts\R2-2103057.doc) Multiple SMTC configurations Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103182](file:///C:\Data\3GPP\Extracts\R2-2103182%20Discussion%20on%20measurement%20in%20NTN.docx) Discussion on measurement in NTN Xiaomi Communications discussion

[R2-2103336](file:///C:\Data\3GPP\Extracts\R2-2103336%20Post-%5b108%5d%5bNTN%5d%20views%20on%20SMTC%20and%20measurement%20gaps.docx) Post-[108][NTN] views on SMTC and measurement gaps Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_NTN\_solutions-Core [R2-2100530](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100530.zip)

[R2-2103356](file:///C:\Data\3GPP\Extracts\R2-2103356_NTN_smtc_measGap.doc) Discussion on updating the timing for SMTC and measurement gap configuration ITRI discussion NR\_NTN\_solutions-Core

[R2-2103362](file:///C:\Data\3GPP\Extracts\R2-2103362%20Measurement%20window%20enhancements%20for%20NTN%20cell.doc) Measurement window enhancements for NTN cell LG Electronics Inc. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103700](file:///C:\Data\3GPP\Extracts\R2-2103700%20Discussion%20on%20SMTC&Gap%20enhancements%20for%20NTN%20.docx) Discussion on SMTC/Gap enhancements for NTN CMCC discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104145](file:///C:\Data\3GPP\Extracts\R2-2104145%20SMTC%20and%20MG%20configuration%20for%20NTN.docx) SMTC and MG configuration for NTN Convida Wireless discussion

[R2-2104200](file:///C:\Data\3GPP\Extracts\R2-2104200%20Measurement%20enhancement%20for%20NTN.docx) Measurement enhancement for NTN ETRI discussion

CHO

[R2-2103335](file:///C:\Data\3GPP\Extracts\R2-2103335%20On%20Connected%20mode%20mobility%20for%20NTN.docx) On Connected mode mobility for NTN Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_NTN\_solutions-Core

* Timing-related events for measurement report or CHO triggering

Proposal 1: The design of time based event for NTN considers at least the following aspects: NTN scenario, time definition and whether it is related to source or target cell.

Observation 1: The need to obtain the information on the UE location is not an issue for quasi-Earth-fixed cells scenario.

Proposal 2: Introduce the timer-based event, which should indicate since when the target cell can be accessed. Timer-based event triggers the CHO only if related radio-based measurement (i.e. Ax) is fulfilled simultaneously.

Proposal 3: Timer- and radio-based execution conditions for NTN CHO can be combined in a similar way as defined for CHO Rel-16. To be decided when Stage-3 is pursued.

* Location-related events for measurement report or CHO triggering

Observation 2: Location-based event requires complex calculations of UE’s position versus satellite/cell center (both the satellite (and cell center location in EMC) move very fast) while not being sufficient to trigger alone the mobility event.

Observation 3: using instantaneous distance metric between UE and cell center may lead to unnecessary handovers and even RLFs.

Observation 4: using a distance change metric enables the UE to determine whether target cells are moving towards/away from the UE.

Observation 5: A distance change metric can be used as an offset parameter in radio measurement events (Ax).

* Combination of events

Proposal 4: Timer- or location-based events for NTN are either linked in the specification with radio measurements based events (e.g. Ax) or always configured jointly with radio measurements based events (e.g. Ax).

Proposal 5: Timer-based event cannot be combined with location-based event for the same CHO candidate cell evaluation criteria. Any of these shall be always linked with the radio measurement based events.

* Chain of Conditional Handovers

Proposal 6: RAN2 is asked to support the mechanism, where the UE can be provided with CHO configurations for cells beyond the next cell change (future candidate cells). Details of the procedure can be left FFS.

* [AT113bis-e][107][NTN] CHO aspects (Nokia)

Initial scope: Discuss the proposals in [R2-2103335](file:///C:\Data\3GPP\Extracts\R2-2103335%20On%20Connected%20mode%20mobility%20for%20NTN.docx)

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Initial deadline (for companies' feedback): Thursday 2021-04-15 18:00 UTC

Initial deadline (for rapporteur's summary in R2-2104366): Thursday 2021-04-15 22:00 UTC

Final scope: Discuss a revision of proposals from [R2-2104366](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104366.zip)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Monday 2021-04-19 18:00 UTC

Final deadline (for rapporteur's summary in R2-2104373): Monday 2021-04-19 22:00 UTC

Proposals marked "for agreement" in R2-2104373 not challenged until Tuesday 2021-04-20 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Tuesday CB session

[R2-2104366](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104366.zip) Summary of offline 107 - [NTN] CHO aspects - first round Nokia discussion NR\_NTN\_solutions-Core

For e-mail agreement:

Proposal 1: Timing information in CHO triggering for NTN describes the time since when the UE can access the candidate CHO target cell.

Proposal 5: Providing the UE with CHO configurations for cells beyond the next cell change (chain of CHOs) can be considered in NTN Rel-17 once basic NTN mobility aspects are addressed.

For online discussion:

Proposal 2: Discuss if location information in CHO triggering condition for NTN describes the distance between the UE and the satellite, considering it does not work in intra-satellite scenarios.

Postpone to next meeting:

Proposal 3: Discuss/FFS if for NTN, the time/location-based event shall be always used with RSRP/RSRQ-based event (Ax) for CHO triggering or measurement report triggering.

Proposal 4: Discuss/FFS if there are any solid NTN use cases where combining the time-based triggering with location-based triggering would be relevant.

* For all the proposals the discussion will continue in a second round of [106]

R2-2104373 Summary of offline 107 - [NTN] CHO aspects - second round Nokia discussion NR\_NTN\_solutions-Core

[R2-2103751](file:///C:\Data\3GPP\Extracts\R2-2103751%20NTN%20connected%20mode.docx) Connected mode aspects for NTN Ericsson discussion NR\_NTN\_solutions-Core

[R2-2103632](file:///C:\Data\3GPP\Extracts\R2-2103632%20WF%20for%20CHO%20in%20NTN.doc) WF for CHO in NTN Huawei, HiSilicon, BT Plc, CAICT, CMCC discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2102742](file:///C:\Data\3GPP\Extracts\R2-2102742%20NTN%20connected%20mode%20mobility.doc) Discussion on mobility management for connected mode UE in NTN OPPO discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2102954](file:///C:\Data\3GPP\Extracts\R2-2102954%20Further%20discuss%20CHO%20solutions%20for%20NR%20NTN.docx) Further discuss CHO solutions for NR NTN CATT discussion

[R2-2103056](file:///C:\Data\3GPP\Extracts\R2-2103056.doc) Configuration and execution of CHO Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core [R2-2100744](file:///C:\Data\3GPP\archive\RAN2\RAN2%23113\Tdocs\R2-2100744.zip)

[R2-2103181](file:///C:\Data\3GPP\Extracts\R2-2103181%20Discussion%20on%20conditional%20handover%20in%20NTN.docx) Discussion on conditional handover in NTN Xiaomi Communications discussion

[R2-2103308](file:///C:\Data\3GPP\Extracts\R2-2103308%20Connected%20mode%20enhancements%20in%20NTN.DOC) Connected mode enhancements in NTN LG Electronics Inc. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103409](file:///C:\Data\3GPP\Extracts\R2-2103409%20Enhancement%20to%20measurement%20reporting%20in%20NTN.docx) Enhancement to measurement reporting in NTN Lenovo, Motorola Mobility discussion Rel-17

[R2-2103410](file:///C:\Data\3GPP\Extracts\R2-2103410%20CHO%20trigger%20condition%20in%20NTN%20v1.0.doc) CHO in NTN system Lenovo, Motorola Mobility discussion Rel-17

[R2-2103465](file:///C:\Data\3GPP\Extracts\R2-2103465%20Configuration%20of%20CHO%20in%20NTN.DOC) Configuration of CHO in NTN China Telecom, Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103600](file:///C:\Data\3GPP\Extracts\R2-2103600.docx) Mobility management in NTN Sony Europe B.V. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103825](file:///C:\Data\3GPP\Extracts\R2-2103825_%20Discussion%20on%20CHO%20for%20NTN.docx) Discussion on CHO for NTN NEC Telecom MODUS Ltd. discussion

[R2-2104065](file:///C:\Data\3GPP\Extracts\R2-2104065_Further%20consideration%20on%20CHO%20in%20NTN.docx) Further consideration on CHO in NTN ZTE corporation, Sanechips discussion Rel-17 NR\_NTN\_solutions-Core

NTN-TN mobility

[R2-2102827](file:///C:\Data\3GPP\Extracts\R2-2102827%20-%20Mobility%20for%20TN-NTN%20scenarios.docx) Mobility for NTN-TN scenarios MediaTek Inc. discussion

[R2-2103620](file:///C:\Data\3GPP\Extracts\R2-2103620%20-%20A%20resubmission%20of%20R2-2101298%20and%20R2-2008973%20Service%20Continuity%20between%20NTN%20and%20TN.docx) Service continuity between NTN and TN Hughes/EchoStar discussion Rel-17 Withdrawn

[R2-2103702](file:///C:\Data\3GPP\Extracts\R2-2103702%20Discussion%20on%20service%20continuity%20between%20NTN%20and%20TN%20.docx) Discussion on service continuity between NTN and TN CMCC discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103976](file:///C:\Data\3GPP\Extracts\R2-2103976%20-%20A%20resubmission%20of%20R2-2101298%20and%20R2-2008973%20Service%20Continuity%20between%20NTN%20and%20TN.docx) Service continuity between NTN and TN Hughes/EchoStar, Thales, BT Plc, Turkcell, Vodafone, ESA, Inmarsat discussion Rel-17

Other

[R2-2103078](file:///C:\Data\3GPP\Extracts\R2-2103078_For8.10.3.3_HandoverEnhancements_Samsung.doc) Handover Enhancements for an NTN Samsung Research America discussion

[R2-2103602](file:///C:\Data\3GPP\Extracts\R2-2103602.doc) Cell coverage spillage over multiple countries issue in NTN Sony Europe B.V. discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2103701](file:///C:\Data\3GPP\Extracts\R2-2103701%20Consideration%20on%20signaling%20issues%20for%20mobility%20enhancements%20.docx) Consideration on signaling issues for mobility enhancements CMCC discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2104153](file:///C:\Data\3GPP\Extracts\R2-2104153%20NTN%20ANR%20enhancements.docx) NTN ANR enhancements Convida Wireless discussion

#### 8.10.3.4 LCS aspects

Potential issues associated to the use of the existing Location Services (LCS) application protocols to locate UE in the context of NTN.

Only reply LSs from other groups, if any, are expected to be handled at this meeting. Company inputs (in response to possible reply LSs) are still possible.

[R2-2102955](file:///C:\Data\3GPP\Extracts\R2-2102955%20Discussion%20on%20network%20selection%20impact%20on%20LCS.docx) Discussion on network selection impact on LCS CATT discussion

## 8.12 Reduced Capability

(NR\_redcap-Core; leading WG: RAN1; REL-17; WID: RP-210918)

Time budget: 0.5 TU

Tdoc Limitation: 2 tdocs

Email max expectation: 2-3 threads

### 8.12.1 Organizational

LSs, rapporteur inputs and other organizational documents. Rapporteur inputs and other pre-assigned documents in this AI do not count towards the tdoc limitation.

[R2-2102678](file:///C:\Data\3GPP\Extracts\R2-2102678_RP-210919.docx) LS on Unified Access Control (UAC) for RedCap (RP-210919; contact: Nokia) RAN LS in Rel-17 NR\_redcap To:SA1, CT1 Cc:RAN2

- Nokia highlights that this part is currently not explicitly mentioned in the WID

- VC thinks that in any case we need to wait for feedback to this LS first

* Noted

[R2-2102964](file:///C:\Data\3GPP\Extracts\R2-2102964%20-%20RAN2%20work%20plan%20for%20RedCap%20WI.docx) RAN2 work plan for RedCap WI Ericsson discussion NR\_redcap-Core

- Intel wonders how to deal with early indication considering the relationship with RAN1 discussion

- Apple thinks we can simply wait for RAN1. Vivo agrees.

- Nokia thinks that RAN2 can work even before RAN1 input.

- VC thinks RAN1 progress is needed to finalize this discussion but we might also start the discussion in RAN2 before

* Noted

### 8.12.2 Framework for reduced capabilities

This agenda item (incl sub-agenda items) will not be treated during this meeting and no company inputs are expected

#### 8.12.2.1 Definition of RedCap UE type and reduced capabilities

[R2-2103249](file:///C:\Data\3GPP\Extracts\R2-2103249%20Discussion%20on%20L2%20buffer%20size%20reduction%20for%20Redcap%20UE.doc) Discussion on L2 buffer size reduction for Redcap UE Spreadtrum Communications discussion Rel-17 NR\_redcap-Core

#### 8.12.2.2 Identification, access and camping restrictions

FFS whether RACH partitioning should be initially done as a common design for multiple WIs: RAN slicing, RedCap, Small Data Transmission, CovEnh? Or whether coordination should be attempted once each WI has produced CRs.

[R2-2102859](file:///C:\Data\3GPP\Extracts\R2-2102859_Identification%20and%20access%20restrictions%20for%20RedCap%20UEs.docx) Identification and access restrictions for RedCap UEs vivo, Guangdong Genius discussion Rel-17 FS\_NR\_redcap

[R2-2102947](file:///C:\Data\3GPP\Extracts\R2-2102947.docx) Camping restriction and cell selection criterion DENSO CORPORATION discussion Rel-17 NR\_redcap-Core

[R2-2103062](file:///C:\Data\3GPP\Extracts\R2-2103062%20RedCap_F.docx) Methods for barring and for capability reporting Sierra Wireless, S.A. discussion

[R2-2103279](file:///C:\Data\3GPP\Extracts\R2-2103279.docx) Access control for RedCap UEs Samsung discussion Rel-17 NR\_redcap-Core

[R2-2103506](file:///C:\Data\3GPP\Extracts\R2-2103506_early%20ind.docx) Early identification and SI indication NEC discussion Rel-17 NR\_redcap-Core

[R2-2103973](file:///C:\Data\3GPP\Extracts\R2-2103973%20(R17%20RedCap%20WI%20AI%208.12.2.2)%20Identification%20and%20Restriction%20of%20RedCap%20UE.docx) Identification and restriction of RedCap UE InterDigital discussion Rel-17 NR\_redcap-Core

### 8.12.3 UE power saving and battery lifetime enhancement

#### 8.12.3.1 eDRX cycles

Specification of extended DRX enhancements for RRC Inactive and Idle, according to the WI objectives

* [AT113bis-e][101][RedCap] eDRX cycles (Intel)

Initial scope: Based on [R2-2102852](file:///C:\Data\3GPP\Extracts\R2-2102852_NR-eDRX.docx), discuss the following aspects:

1. Which node decides the eDRX cycle for RRC inactive (RAN vs CN)
2. Whether eDRX cycles for idle and inactive use different or same configuration
3. List of issues to be included in a LS to SA2/CT1

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions

Initial deadline (for companies' feedback): Tuesday 2021-04-13 16:00 UTC

Initial deadline (for rapporteur's summary in [R2-2104360](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104360.zip)): Tuesday 2021-04-13 20:00 UTC

Final scope: Continue the discussion on the following aspects:

1. FFSs on eDRX configuration, e.g. based on p4.x from [R2-2104360](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104360.zip)
2. p5, p6, p7 from [R2-2102852](file:///C:\Data\3GPP\Extracts\R2-2102852_NR-eDRX.docx)

Final intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Final deadline (for companies' feedback): Friday 2021-04-16 02:00 UTC

Final deadline (for rapporteur's summary in [R2-2104367](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104367.zip)): Friday 2021-04-16 06:00 UTC

Proposals marked "for agreement" in [R2-2104367](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104367.zip) not challenged until Monday 2021-04-19 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue online in the Monday CB session.

[R2-2104360](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104360.zip) Summary of offline 101 - [REDCAP] eDRX cycles - first round Intel discussion NR\_redcap-Core

Proposals for potential agreement

Proposal 1. [To agree] [20/23] RAN controls the configuration of eDRX for RRC\_INACTIVE.

- Apple understands the majority wants this but thinks it would be easier to go the other way

- Nokia thinks this should read "RAN configures…"

- LGE supports this assuming there is a coordination with the CN

* RAN decides and configures eDRX via RRC for RRC\_INACTIVE (FFS on the need and details of coordination with the CN)

Proposal 3. [To agree] [21/23] The configurations of the eDRX for RRC\_IDLE and RRC\_INACTIVE can be different.

- ZTE thinks it's fine to have different eDRX cycle, but for PTW they should be the same/overlapping. Oppo and CATT support this view.

- Vivo thinks the length of the PTW can be different

- QC is fine but would like to clarify this applies when both eDRX cycles are longer than 10.24s

- Apple think we should discuss relation between the eDRX cycles. QC thinks we don't have to discuss this

* At least for eDRX cycle, the configurations of the eDRX for RRC\_IDLE and RRC\_INACTIVE can be different (FFS for PTW, e.g. length and starting point, when eDRX cycles are longer than 10.24s)

Proposal 5. [To agree] LS to SA2/CT1 will include following:

Proposal 5.1. [To agree] [21/23] Include RAN2 agreements from this meeting, if any, related to NR eDRX design (e.g. node to control INACTIVE eDRX, whether eDRX config. for IDLE and INACTIVE are same or different), and ask them for any feedback, if any.

Proposal 5.2. [To agree] [19/23] Ask them about feasibility of having a maximum eDRX cycle up set to 10485.76s for both RRC\_IDLE and RRC\_INACTIVE (e.g. considering NAS re-transmission timer).

* Agreed to include p5.1 and p5.2 in a LS to SA2/CT1. We can discuss further this week whether to add other things.

Proposals for potential discussion online

Proposal 4. [To discuss] To discuss the following details in relation to Proposal 3:

Proposal 4.1. [To discuss] [9/21] To consider that any coordination between eDRX configurations for RRC\_IDLE / RRC\_INACTIVE is left up to network implementation

Proposal 4.2. [To discuss] [11/21] To consider that RAN guarantees that the configuration provided for eDRX in RRC\_INACTIVE is a sub-set of one provided for eDRX in RRC\_IDLE. E.g. eDRX cycle in RRC\_INACTIVE may be shorter than the eDRX cycle in RRC\_IDLE, and the PTW should be either common or overlapping in the case either window is shorter than the other.

Proposal 4.3. [To discuss] [12/21] To consider that different eDRX configuration refers to different eDRX cycle and when applicable, different PTW.

Proposal 6. [FFS] If there is larger support, to further discuss in future meetings if an LS to SA2/CT1 needs to include any of the following points:

Proposal 6.1. [FFS] [9/23] Include the conclusions on eDRX in TR 38.875, v2.0.0.

Proposal 6.2. [FFS] [5/23] Ask them about feasibility of buffering data in CN when the UE is unreachable from CN perspective, i.e. when the UE is in eDRX in RRC\_INACTIVE. If so, RAN2 assumes that CN provides an indication to RAN in case the mobile terminating traffic is pending towards the UE.

Proposal 6.3. [FFS] [5/23] RAN2 assumes that RAN provides necessary information to CN so that CN can estimate when the UE is unreachable, e.g. by providing the RAN paging configuration

Proposal 6.4. [FFS] [4/23] Include WI objective and ask them whether there is any concern.

Proposals for potential discussion in future meetings

Proposal 2. [FFS] [7] If there is larger support, to further discuss in future meetings whether RAN can provide assistance information towards CN about DL data forwarding for UEs in RRC\_INACTIVE configured with eDRX by RAN.

Agreements:

1. RAN decides and configures eDRX via RRC for RRC\_INACTIVE (FFS on the need and details of coordination with the CN)
2. At least for eDRX cycle, the configurations of the eDRX for RRC\_IDLE and RRC\_INACTIVE can be different (FFS for PTW, e.g. length and starting point, when eDRX cycles are longer than 10.24s)

[R2-2104367](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104367.zip) Summary of offline 101 - [REDCAP] eDRX cycles - second round Intel discussion NR\_redcap-Core

Proposals for potential email agreement

Proposal 3. [To agree] [19/19] RAN2 assumes that CN provides necessary assistance information on eDRX config. for RRC\_IDLE to RAN (e.g. reusing eDRX config. defined in “CN Assistance Information for RRC INACTIVE IE” for E-UTRA/5GC).

* Agreed

Proposal 4. [To agree] [10/19] To wait for SA2 input on whether RAN provides necessary eDRX assistance information for RRC\_INACTIVE to CN so that CN can estimate when the UE is unreachable, e.g. by providing the RAN paging configuration.

- Oppo thinks it’s totally out of RAN2’s scope, e.g. whether RAN provides information to CN and how does the CN use such information. All these should be discussed in RAN3/SA2. So we propose to revise proposal 4 as: Leave it to other working groups to decide whether RAN provides necessary eDRX assistance information for RRC\_INACTIVE to CN.

- Nokia thinks that RAN2 can agree that from RAN2 perspective it is beneficial that RAN provides necessary eDRX assistance information for RRC\_INACTIVE to CN.

* Continue online

- QC agrees with Nokia and thinks SA2 has no TUs and then we need to trigger the discussion via a LS. Ericsson agrees

- Intel thinks there was no full support for this in the email discussion.

* Continue the discussion as part of offline [108] to draft an LS to SA2/CT1

Proposal 5. [To agree] [16/19] From UE point of view, a common paging mechanism/behaviour is enabled for eDRX ≤ 10.24 sec in RRC\_IDLE and/or RRC\_INACTIVE.

- Comments from multiple companies (Ericsson, Mediatek, Nokia, Apple) that it is not clear what “common paging mechanism/behaviour” exactly means

* Continue online

Proposal 7. [To agree] [14/19] As baseline from UE point of view, a common paging mechanism/behaviour is enabled for eDRX >10.24sec in RRC\_IDLE and/or RRC\_INACTIVE

- Comments from multiple companies (Ericsson, Mediatek, Nokia, Apple) that it is not clear what “common paging mechanism/behaviour” exactly means

* Continue online

Proposal 8. [To agree] [18/19] eDRX feature, including the related parameters (i.e. PH, PTW. H-SFN) and corresponding paging operation defined for E-UTRA/5GC is used as baseline to enable eDRX >10.24sec for both RRC\_IDLE and RRC\_INACTIVE in NR/5GC

* Agreed

Proposal 10. [To agree] [19/19] RAN2 confirms that CN paging and RAN paging use the same paging frame offset and first PDCCH monitoring occasion in PO, which are configured by RAN without involvement of CN.

* Agreed

Proposal 11. [To agree] [19/19] RAN2 confirms that SI modification mechanism from LTE is used as a baseline for SI change (other than ETWS and CMAS), i.e. by using an eDRX acquisition period and a flag to indicate SI modification for eDRX in Short Message (e.g. systemInfoModification-eDRX)

* Agreed

Agreements - via email (from offline [101]):

1. RAN2 assumes that CN provides necessary assistance information on eDRX config. for RRC\_IDLE to RAN (e.g. reusing eDRX config. defined in “CN Assistance Information for RRC INACTIVE IE” for E-UTRA/5GC).
2. eDRX feature, including the related parameters (i.e. PH, PTW. H-SFN) and corresponding paging operation defined for E-UTRA/5GC is used as baseline to enable eDRX >10.24sec for both RRC\_IDLE and RRC\_INACTIVE in NR/5GC
3. RAN2 confirms that CN paging and RAN paging use the same paging frame offset and first PDCCH monitoring occasion in PO, which are configured by RAN without involvement of CN.
4. RAN2 confirms that SI modification mechanism from LTE is used as a baseline for SI change (other than ETWS and CMAS), i.e. by using an eDRX acquisition period and a flag to indicate SI modification for eDRX in Short Message (e.g. systemInfoModification-eDRX)

Proposals for potential discussion online

Proposal 1.[To discuss] For eDRX >10.24sec, to discuss whether PTW configuration for RRC\_IDLE / RRC\_INACTIVE follows: option 1) [6/19] It is left up to network implementation any coordination on how to decide the PTW configurations for RRC\_IDLE and for RRC\_INACTIVE (i.e. PTW may be configured same or different); option 2) [9/19] A common PTW configuration is provided for RRC\_IDLE and for RRC\_INACTIVE; option 4) [7/19] PTW for RRC\_IDLE overlaps with PTW for RRC\_INACTIVE, and PTW length for RRC\_IDLE can be same or larger than PTW length for RRC\_INACTIVE (but not smaller)

Proposal 6. [To discuss] applicable option to enable paging eDRX mechanism for eDRX ≤ 10.24sec in RRC\_IDLE and/or RRC\_INACTIVE, considering at least option 1) [8/19] UE only monitors UE-specific paging eDRX applicable to the corresponding RRC state (instead of the smallest of the configured ones). i.e. a UE in RRC\_INACTIVE monitors eDRX cycle configured for RRC\_INACTIVE, and a UE in RRC\_IDLE monitors eDRX cycle configured for RRC\_ IDLE, and option 2) [8/19] the UE in RRC ACTIVE monitors PO with eDRX cycle T, where T is determined by the shortest of CN eDRX cycle and RAN eDRX cycle

Proposal 14. [To discuss] preferred minimum value allowed for the eDRX cycle in RRC\_IDLE and RRC\_INACTIVE is option 2) [8/19] 2.56 sec or option 3) [12/19] 5.12 sec.

Proposals for potential discussion in future meetings

Proposal 2. [FFS] [9/19] whether to specify UE behavior based on the eDRX configuration combinations for idle and inactive: 1) eDRX only configured for idle, cases eDRX ≤ 10.24sec and eDRX >10.24sec, 2) eDRX only configured for inactive, cases eDRX ≤ 10.24sec and eDRX >10.24sec, 3) eDRX configured both for inactive and idle, 3-a) both eDRX ≤ 10.24sec, 3-b) one of the eDRX≤ 10.24sec and the other eDRX>10.24s, 3-c) both of the eDRX>10.24s.

Proposal 9. [FFS] whether NR PTW definition is different than LTE PTW (which is defined as fixed to multiples of 256 SFNs), e.g. considering configurable by the network.

Proposal 12. [FFS] [1] Whether to indicate the eDRX support in a cell by a flag (e.g. eDRX-Allowed) in SI (e.g. SIB1).

Proposal 13. [FFS] [1] whether to discuss and if so, how the buffering should be done in case there is pending DL data and both IDLE and INACTIVE cycles are relatively long.

[R2-2102852](file:///C:\Data\3GPP\Extracts\R2-2102852_NR-eDRX.docx) Extend paging DRX for RedCap devices Intel Corporation discussion Rel-17 NR\_redcap

Proposal 1. AMF is the node in charge to control eDRX for UEs in RRC\_IDLE.

Proposal 1.1. For eDRX in RRC\_IDLE, RAN2 assumes that eDRX functionality defined for E-UTRA connected to 5GC is taken as baseline for NR (e.g. AMF provides its configuration via NAS, and when having to page the given UE, triggers associated PH/PTW).

Proposal 2. gNB is the node in charge to control eDRX for UEs in RRC\_INACTIVE and guarantees that configuration provided for eDRX in RRC\_INACTIVE is a sub-set of one provided for eDRX in RRC\_IDLE.

Proposal 3. UE in RRC\_IDLE gets the eDRX configuration via NAS. RAN2 assumes that legacy mechanism to provide eDRX configuration already defined for E-UTRA/5GC can be reused for NR/5GC. Inform SA2/CT1 for input, if any.

Proposal 4. UE in RRC\_INACTIVE gets the eDRX configuration via RRC.

Proposal 4.1. It is left up to gNB implementation to decide whether to use same or different eDRX configuration for a UE in RRC\_INACTIVE as the one provided by AMF for that UE in RRC\_IDLE.

Proposal 4.2. RAN2 specification guarantees that a UE monitoring eDRX paging for RRC\_INACTIVE can also receive its corresponding eDRX paging for RRC\_IDLE (i.e. eDRX configuration provided for a UE in RRC\_INACTIVE is a sub-set of the configuration provided to the UE in RRC\_IDLE).

Proposal 5. If proposals 3 and 4 are agreed, paging mechanism is updated with eDRX ≤ 10.24sec to monitor only the UE-specific paging DRX for the corresponding RRC state (instead of the smallest of the configured ones).

Proposal 6. If proposals 3 and 4 are agreed, applicable part of eDRX (i.e. PH, PTW) defined for E-UTRA/5GC is used as baseline to enable eDRX >10.24sec for both RRC\_IDLE and RRC\_INACTIVE in NR/5GC.

Proposal 7. The DRX value of 2.56 sec can be defined as one of the possible Extended DRX cycles for UEs in RRC\_IDLE / RRC\_INACTIVE if TS impact is minimal (i.e. following the same operation defined for any eDRX ≤ 10.24sec).

Proposal 8. Send an LS to SA2, and CT1 asking for feasibility (e.g. considering NAS re-transmission timer, or UE’s RRM requirements) if the maximum extended DRX length for UEs in RRC\_IDLE and RRC\_INACTIVE is allowed up to 10485.76 sec.

Proposal 9. Send an LS to SA2, CT1 including all agreed proposals on eDRX (for RRC\_IDLE and RRC\_INACTIVE) and ask whether they may have any input (e.g. considering eDRX feature already supported in 5GC when connected to E-UTRA).

[R2-2102681](file:///C:\Data\3GPP\Extracts\R2-2102681_Discussions%20on%20eDRX%20configuration.docx) Discussions on eDRX configuration Qualcomm Incorporated discussion Rel-17 FS\_NR\_redcap

[R2-2102736](file:///C:\Data\3GPP\Extracts\R2-2102736%20-%20Discussion%20on%20eDRX%20for%20RedCap%20UEs.doc) Discussion on eDRX for RedCap UEs OPPO discussion Rel-17 FS\_NR\_redcap

[R2-2102852](file:///C:\Data\3GPP\Extracts\R2-2102852_NR-eDRX.docx) Extend paging DRX for RedCap devices Intel Corporation discussion Rel-17 NR\_redcap

[R2-2102862](file:///C:\Data\3GPP\Extracts\R2-2102862%20Discussion%20on%20e-DRX%20for%20Redcap%20Devices.doc) Discussion on e-DRX for Redcap Devices Xiaomi Communications discussion

[R2-2102962](file:///C:\Data\3GPP\Extracts\R2-2102962.docx) Work on eDRX for RedCap UEs DENSO CORPORATION discussion Rel-17 NR\_redcap-Core

[R2-2102965](file:///C:\Data\3GPP\Extracts\R2-2102965%20-Discussion%20of%20eDRX%20for%20RedCap.docx) Discussion of eDRX for RedCap Ericsson discussion NR\_redcap-Core

[R2-2103039](file:///C:\Data\3GPP\Extracts\R2-2103039%20Discussion%20on%20eDRX%20for%20RedCap%20UE.docx) Discussion on eDRX for RedCap UE ZTE Corporation, Sanechips discussion Rel-17 FS\_NR\_redcap

[R2-2103112](file:///C:\Data\3GPP\Extracts\R2-2103112.doc) Discussion On eDRX for NR RRC Inactive and Idle CATT discussion Rel-17 NR\_redcap-Core

[R2-2103530](file:///C:\Data\3GPP\Extracts\R2-2103530%20eDRX%20for%20REDCAP%20UE.docx) eDRX for REDCAP Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_redcap-Core

[R2-2103622](file:///C:\Data\3GPP\Extracts\R2-2103622%20eDRX%20for%20RedCap%20UEs%20in%20RRC_Idle%20and%20Inactive.docx) eDRX for RedCap UEs in RRC\_IDLE/RRC\_INACTIVE LG Electronics UK discussion Rel-17

[R2-2103707](file:///C:\Data\3GPP\Extracts\R2-2103707%20Discussion on eDRX for RedCap.docx) Discussion on eDRX for RedCap CMCC discussion Rel-17 NR\_redcap-Core

[R2-2103783](file:///C:\Data\3GPP\Extracts\R2-2103783%20Further%20considerations%20for%20eDRX.docx) Further considerations for eDRX MediaTek Inc. discussion Rel-17 NR\_redcap-Core

[R2-2103887](file:///C:\Data\3GPP\Extracts\._R2-2103887-256-eDRX.docx) RedCap UE power-saving with 2.56 DRX cycle Apple discussion Rel-17 NR\_redcap-Core

[R2-2104059](file:///C:\Data\3GPP\Extracts\R2-2104059%20eDRX%20for%20RedCap%20UE.docx) eDRX for RedCap UE Huawei, HiSilicon discussion Rel-17 NR\_redcap-Core

* [AT113bis-e][108][RedCap] LS on eDRX cycles (Ericsson)

Scope: Discussion the content of an LS to SA2/CT1 based on meeting agreements. Check if additional questions/RAN2 preferences can be included in the LS (based on the discussion in the meeting).

Intended outcome: Approved LS

Deadline (for companies' feedback): Monday 2021-04-26 16.00 UTC

Deadline (for final LS in R2-2104374): Tuesday 2021-04-27 16.00 UTC

#### 8.12.3.2 RRM relaxations

Investigation of RRM measurement relaxation criteria for neighbouring cells, according to the WI objectives

* [AT113bis-e][102][RedCap] RRM relaxations (Qualcomm)

Initial scope: Based on [R2-2102682](file:///C:\Data\3GPP\Extracts\R2-2102682_RRM%20relaxation%20enhancements%20for%20stationary%20UEs.docx) discuss the following aspects:

1. Definition of stationarity
2. RRM relaxation criteria in RRC Idle/Inactive (no methods)
3. RRM relaxation criteria in RRC Connected (no methods)

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions

Initial deadline (for companies' feedback): Tuesday 2021-04-13 14:00 UTC

Initial deadline (for rapporteur's summary in [R2-2104361](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104361.zip)): Tuesday 2021-04-13 18:00 UTC

Intermediate scope: Continue the discussion on the following aspects:

1. Whether - besides an RSRP/RSRQ based criterion - we can have a WA on having a Stationary property based on subscription and the need for a related LS to SA2.
2. For the RSRP/RSRQ based criterion, continue the discussion on whether reuse R16 thresholds or new ones
3. Whether we can have a beam based criterion
4. Continue the discussion on p4 and p7 from [R2-2104361](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104361.zip)

Intermediate intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Intermediate deadline (for companies' feedback): Friday 2021-04-16 00:00 UTC

Intermediate deadline (for rapporteur's summary in [R2-2104368](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104368.zip)): Friday 2021-04-16 04:00 UTC

Final scope: Check whether revised p3 from second round of offline [102] is agreeable

Final intended outcome: Agreeable revised p3

Final deadline (for rapporteur's proposal in R2-2104375): Tuesday 2021-04-20 00:00 UTC

If the proposal in R2-2104375 will not be challenged until Tuesday 2021-04-20 12:00 UTC, it will be declared as agreed via email by the session chair.

[R2-2104361](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104361.zip) Summary of offline 102 - [REDCAP] RRM relaxations - first round Qualcomm discussion NR\_redcap-Core

Proposals for agreement:

Proposal 1. (15/21) The definition of stationary UEs in R17 is based on the R16 low-mobility criterion but uses a separate set of thresholds specifically configured for stationary UEs.

- Ericsson is not convinced on the gains and think we could reuse R16 criteria. ZTE has similar concerns, also think we should refer to "RedCap stationary UEs". Also Mediatek has similar concerns and we could base this on a stationary property.

- CATT thinks it's very tricky to add new thresholds.

- Apple thinks it's too restrictive to assume RedCap UEs should be fully stationary to have RRM relaxation

- Mediatek thinks we could send an LS to SA2 asking about the stationary property

* Assuming there will be a stationary property based on subscription (which is FFS), we will not restrict to this and will continue to assume that a UE can use some RSRP/RSRQ based criteria (FFS whether reuse R16 thresholds or new ones. FFS also on the use of a beam based criteria)

Proposal 4. (20/21) Reuse the R16 RRM relaxation triggering criteria for R17 stationary UEs in RRC Idle/Inactive, with the R16 low-mobility criterion replaced by R17 stationarity criterion.

Proposal 7. (11/15) R17 RRM relaxation criteria in RRC Connected should reuse R17 RRM relaxation criteria in RRC Idle/Inactive. No new enhancements will be studied.

Proposals for further discussion:

Proposal 2. (10/21) Discuss whether beam-related enhancements should be included in the definition of stationary UE specified in Proposal 1.

Proposal 3. (11/21) Discuss whether subscription information can be used as an additional method in determining stationarity of a UE.

Proposal 5. (11/16) Discuss whether network can configure a separate set of thresholds for not-at-cell-edge criterion used by R17 stationary UEs.

Proposal 6. (3/20) Postpone the discussion on R17 UE behavior when both R16 and R17 relaxation criteria are configured.

Proposal 8. (12/20) In RRC Connected, UE needs a confirmation from network to trigger its RRM relaxations even after UE has met the relaxation criteria configured by network.

Agreements:

1. Assuming there will be a stationary property based on subscription (which is FFS), we will not restrict to this and will continue to assume that a UE can use some RSRP/RSRQ based criteria (FFS whether reuse R16 thresholds or new ones. FFS also on the use of a beam based criteria)

[R2-2104368](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104368.zip) Summary of offline 102 - [REDCAP] RRM relaxations - second round Qualcomm discussion NR\_redcap-Core

Proposals for potential agreements:

Proposal 2. (13/16) A measurement-based R17 stationarity criterion can be configured separately from R16 low-mobility criterion for stationary UEs. FFS whether this stationarity criterion is based on

- the same algorithm used in R16 low-mobility criterion but with its own specific set of thresholds (11/16); and/or

- a combination of R16 low-mobility criterion and some type of beam-change based criterion (7/16).

- For proposal 2 and 3, Ericsson wonders what it means that the criterion is "for stationary UEs". Does this proposal already assume that there is some classification of UEs to "stationary" vs. "mobile" (e.g. based on subscription info?) and only UEs which are classified as "stationary" can use this new criteria? Or is the "for stationary UE"-wording referring to that the NW should send using dedicated signalling (in the RRCRelease) the thresholds to only UEs which the NW think is stationary?

- Also Nokia has some concerns

- Samsung wonders on the need to have the "and" option

Proposal 3. (13/16) Network can configure R17 stationarity criterion/criteria, as well as a not-at-cell-edge criterion, for stationary UEs to trigger RRM relaxations in RRC Idle/Inactive.

- CATT is not sure at all that the not-at-cell-edge criterion will play any role once the R17 stationary criterion is fulfilled. That is we are not sure that RAN4 will define a different relaxation mechanism for R17 relaxation, depending on whether not-at-cell-edge criterion is met or not. Such situation occurred already in R16 Power Saving and we would therefore prefer to avoid the resulting back-and-forth LSs with RAN4 resulting on coming back on early decisions made in RAN2. So, we don't mind keeping the door open but with a condition on RAN4 final decision, for example: Proposal 3. Network can configure R17 stationarity criterion/criteria, as well as a not-at-cell-edge criterion, for stationary UEs to trigger RRM relaxations in RRC Idle/Inactive, if RAN4 decides to specify a different relaxation mechanism for R17 relaxation, depending on whether not-at-cell-edge criterion is met or not.

* No proposal is agreed via email and the discussion will continue online based on the revised proposals 2 and 3 below

Proposals for further discussion:

Proposal 1. (9/16) Stationarity in subscription information can be used to trigger relaxations for UE with fixed locations, if its benefits (e.g. power saving gains, reliability) can be further justified. (14/16) If agreed, include it in the LS to SA2.

Proposal 4. (8/16) Reuse the R17 RRM relaxation criteria in RRC Idle/Inactive for relaxations in RRC Connected, if its benefits over network implementation can be further justified.

* The discussion will continue online

Revised Proposal 2: At least for RRC idle/inactive, a measurement-based R17 stationarity criterion can be configured separately from R16 low-mobility criterion for R17 UEs supporting the feature. FFS how the configuration is provided. FFS whether this stationarity criterion is based on

- the same algorithm used in R16 low-mobility criterion but with its own specific set of thresholds (11/16); and/or

- a combination of R16 low-mobility criterion and/or beam-change based criterion. Exact details of beam change criterion are FFS (7/16).

- QC/Apple think the definition of stationarity could be independent on the state but could accept this formulation.

* Agreed

Agreements:

1. At least for RRC idle/inactive, a measurement-based R17 stationarity criterion can be configured separately from R16 low-mobility criterion for R17 UEs supporting the feature. FFS how the configuration is provided. FFS whether this stationarity criterion is based on:

- the same algorithm used in R16 low-mobility criterion but with its own specific set of thresholds; and/or

- a combination of R16 low-mobility criterion and/or beam-change based criterion. Exact details of beam change criterion are FFS.

Revised Proposal 3: Network can configure R17 stationarity criterion/criteria, as well as a not-at-cell-edge criterion, to trigger RRM relaxations in RRC Idle/Inactive for R17 UEs supporting the feature, if RAN4 decides to specify a different relaxation mechanism for R17 relaxation, depending on whether not-at-cell-edge criterion is met or not.

* Check if revised p3 is agreeable in a third round of offline [102]

[R2-2104375](file:///C:\Data\3GPP\RAN2\Inbox\R2-2104368.zip) Summary of offline 102 - [REDCAP] RRM relaxations - third round Qualcomm discussion NR\_redcap-Core

[R2-2102682](file:///C:\Data\3GPP\Extracts\R2-2102682_RRM%20relaxation%20enhancements%20for%20stationary%20UEs.docx) RRM relaxation enhancements for stationary UEs Qualcomm Incorporated discussion Rel-17 FS\_NR\_redcap

Proposal 1. A fixed-location UE is determined based on its subscription.

Proposal 2. A UE is considered temporarily stationary in RRC Idle/Inactive/Connected if it satisfies the following criterion:

Srxlevstationary – Srxlev < SSearchDeltaP\_stationary for a period of TSearchDeltaP\_stationary,

where Srxlevstationary, SSearchDeltaP\_stationary and TSearchDeltaP\_stationary are new R17 parameters advertised/configured by network.

Proposal 3. Network can independently enable/disable RRM relaxation for fixed-location and/or temporarily stationary UEs.

Proposal 4. When RRM relaxation for stationary UEs are enabled, network can additionally configure R17 not-at-cell-edge criterion for stationary UEs.

Proposal 5. A stationary UE is considered not-at-cell-edge if it satisfies the following criterion:

Srxlev > SSearchThresholdP\_stationary and Squal > SSearchThresholdQ\_stationary (if configured),

where SSearchThresholdP\_stationary and SSearchThresholdQ\_stationary are new R17 parameters advertised by network.

Proposal 6. If a R17 UE satisfies either fixed-location or temporarily stationary criterion and the corresponding RRM relaxation is enabled, it applies the following relaxation method:

• If R17 not-at-cell-edge criterion is not enabled or UE does not meet the R17 not-at-cell-edge criterion

- Relax its measurements on intra-frequency, inter-frequency/RAT of equal or lower priority with a longer interval (i.e. scaling factor);

- Relax its inter-frequency/RAT of higher priority with a longer interval if Srxlev < SnonIntraSearchP and Squal < SnonIntraSearchQ. Otherwise, stop those measurements for a configured duration.

• Else (i.e. UE is considered not-at-cell-edge)

- Stop all its neighbor-cell RRM measurements for a configured duration.

Proposal 7. The scaling factor for relaxed measurements and the duration for stopped measurements used by R17 stationary UEs can be different from those used in R16.

Proposal 8. A stationary UE in RRC Connected applies the same \*type\* of RRM relaxation criteria and RRM relaxation methods as those for RRC Idle/Inactive. But parameters used in the relaxation criteria and relaxation methods can be different.

Proposal 9. RRM relaxation criteria and parameters for stationary UEs in RRC Connected can be configured by either dedicated signaling or broadcast.

Proposal 10. Fixed-location UE can indicate its stationarity via capability signaling, so that network to configure a relaxed measurement configuration for the UE.

Proposal 11. If relaxation for stationary UEs are not configured in SIBs, temporarily stationary UE can request RRM relaxation via UE Assistance Information.

Proposal 12. If RRM relaxation triggers and parameters for RRC Connected is configured in SIBs, stationary UEs can autonomously determine when to trigger RRM relaxation and which relaxation method to apply according to the advertised configuration.

Proposal 13. R17 network can provide any combination of the following set of RRM relaxation configurations in a cell:

• R17 RRM relaxation for stationary UEs (fixed location and/or temporarily stationary);

• R16 RRM relaxation for low mobility UEs;

• R16 RRM relaxation for not-at-cell-edge UEs.

A R17 UE should be allowed to apply RRM relaxation associated with any of the above criteria that it satisfies.

Proposal 14. R17 RRM measurements relaxation enhancements are applicable to any R17 UEs.

[R2-2102737](file:///C:\Data\3GPP\Extracts\R2-2102737%20-%20Discussion%20on%20RRM%20relax%20%20for%20RedCap%20UEs.doc) Discussion on RRM relax for RedCap UEs OPPO discussion Rel-17 FS\_NR\_redcap

[R2-2102853](file:///C:\Data\3GPP\Extracts\R2-2102853%20RRM%20measurement%20relaxation%20criteria%20for%20RedCap%20devices.docx) RRM measurement relaxation criteria for RedCap devices Intel Corporation discussion Rel-17 NR\_redcap

[R2-2102860](file:///C:\Data\3GPP\Extracts\R2-2102860_Discussion%20on%20RRM%20relaxation%20criteria%20for%20neighboring%20cells.docx) Discussion on RRM relaxation criteria for neighboring cells vivo, Guangdong Genius discussion Rel-17 FS\_NR\_redcap

[R2-2102966](file:///C:\Data\3GPP\Extracts\R2-2102966%20-Mechanisms%20for%20RRM%20relaxation%20for%20RedCap.docx) Mechanisms for RRM relaxation for RedCap Ericsson discussion NR\_redcap-Core

[R2-2103038](file:///C:\Data\3GPP\Extracts\R2-2103038%20RRM%20relaxation%20for%20RedCap%20UE.docx) RRM relaxation for RedCap UE ZTE Corporation, Sanechips discussion Rel-17 FS\_NR\_redcap

[R2-2103113](file:///C:\Data\3GPP\Extracts\R2-2103113.doc) Discussion On RRM Relaxations CATT discussion Rel-17 NR\_redcap-Core

[R2-2103150](file:///C:\Data\3GPP\Extracts\R2-2103150%20Discussion%20on%20RRM%20relaxation%20for%20RedCap%20UE.docx) Discussion on RRM relaxation for RedCap UE Xiaomi Communications discussion Rel-17

[R2-2103206](file:///C:\Data\3GPP\Extracts\R2-2103206%20RRM%20relaxation%20in%20RRC_CONNECTED%20for%20RedCap%20UEs.doc) RRM relaxation in RRC\_CONNECTED for RedCap UEs SHARP Corporation discussion

[R2-2103309](file:///C:\Data\3GPP\Extracts\R2-2103309%20RRM%20relaxation%20for%20RedCap%20devices.DOC) RRM relaxation for RedCap devices LG Electronics Inc. discussion Rel-17 NR\_redcap-Core

[R2-2103402](file:///C:\Data\3GPP\Extracts\R2-2103402%20RRM%20relaxation%20for%20stationary%20UE%20with%20reduced%20capability.docx) RRM relaxation for stationary UE with reduced capability Lenovo, Motorola Mobility discussion Rel-17

[R2-2103495](file:///C:\Data\3GPP\Extracts\R2-2103495%20On%20RRM%20relaxation%20for%20REDCAP%20UE.docx) On RRM relaxations for REDCAP Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_redcap-Core

[R2-2103691](file:///C:\Data\3GPP\Extracts\R2-2103691Discussion%20on%20the%20RRM%20relaxation%20for%20RedCap%20UEs.docx) Discussion on the RRM relaxation for RedCap Ues CMCC discussion Rel-17 NR\_redcap-Core

[R2-2103781](file:///C:\Data\3GPP\Extracts\R2-2103781%20Discussion%20on%20RRM%20Relaxation%20of%20REDCAP%20UE.docx) Discussion on RRM Relaxation of REDCAP UE China Telecommunications discussion Rel-17

[R2-2103784](file:///C:\Data\3GPP\Extracts\R2-2103784%20On%20RRM%20relaxation%20for%20RedCap%20devices.docx) On RRM relaxation for RedCap devices MediaTek Inc. discussion Rel-17 NR\_redcap-Core

[R2-2103888](file:///C:\Data\3GPP\Extracts\._R2-2103888-RRM-RedCap.docx) RRM relaxation down selection of options for RedCap Apple discussion Rel-17 NR\_redcap-Core

[R2-2103974](file:///C:\Data\3GPP\Extracts\R2-2103974%20(R17%20RedCap%20WI%20AI%208.12.3.2)%20RRM%20relaxation%20for%20RedCap%20UE.docx) RRM relaxation for RedCap UE InterDigital discussion Rel-17 NR\_redcap-Core

[R2-2104060](file:///C:\Data\3GPP\Extracts\R2-2104060%20RRM%20measurement%20relaxation%20for%20RedCap%20UE.doc) RRM measurement relaxation for RedCap UE Huawei, HiSilicon discussion Rel-17 NR\_redcap-Core

[R2-2104081](file:///C:\Data\3GPP\Extracts\R2-2104081.doc) RRM relaxation criteria for RedCap devices Samsung discussion Rel-17

## Summary

Agreed CRs

TBD

Approved LSs out

TBD

[POST113bis -e] Email discussions

TBD