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) |

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| --- | --- | --- | --- |
| **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 any offline discussion(s)**  **[RedCap]**  **- Outcome of any offline discussion(s)** | 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 (if needed)** |
| 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)

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): Tuesday 2021-04-13 20:00 UTC

Status: Not yet started

* [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): Tuesday 2021-04-13 18:00 UTC

Status: Not yet started

## 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

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

### 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.

#### 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.

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

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.

* 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.

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.

[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.

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.

[R2-2102932](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

[R2-2103951](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

[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.

[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

* 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.

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.

Proposal P4A. The network can make PDCP discardTimer and PDCP t-Reordering timer greater than the RLC t-Reassembly timer in an implementation-specific manner.

[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.

[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.

[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.

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

[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.

[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).

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

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

Proposal 3.1. [To agree] [13/21] To enable the usage one or more SMTC configuration(s) with one or more offset(s) 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).

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] 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.

[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.

[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

* 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

### 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): Tuesday 2021-04-13 20:00 UTC

R2-2104360 Summary of offline 101 - [REDCAP] eDRX cycles - first round Intel discussion NR\_redcap-Core

[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

[R2-2102681](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

[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

#### 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): Tuesday 2021-04-13 18:00 UTC

R2-2104361 Summary of offline 102 - [REDCAP] RRM relaxations - first 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

[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

[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