3GPP TSG-RAN WG2 Meeting #119 electronic R2-2208701

Online, Aug 2022

**Agenda item: 10.2**

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

**Title: Report from Break-out session on NR-NTN, IoT-NTN, REDCAP and CE**

**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 [AT119-e][000]

Organizational

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

* [AT119-e][100] ****Organizational – NR-NTN, IoT-NTN, REDCAP and CE session (RAN2 VC)****

Scope:

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

Schedule/Plan

WEEK 1:

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** | **Web Conference R2 - BO2** |
| **Wednesday** |  |  |  |
| 12:30-13:30 | NR17 IAB ePowSav (Johan) | NR17 MUSIM, Upto 71Ghz, RAN Slice Selected early Items (Tero) | SL Maintenance, if needed (Kyeongin)  NR17 SL enh (Kyeongin) |
| 13:30-14:30 | NR17 feMIMO (Johan) | NR17 Small Data Enh (Diana)  NR17 IIOT (Diana) | NR17 SL Relay (Nathan) |
| 14:30-15:30 | NR17 DCCA (Tero) | NR151617 UP, if needed (Diana)  NR17 RACH indication / partitioning (Diana) | NR17 Pos (Nathan) |
| **Thursday** |  |  |  |
| 12:30-13:30 | NR17 MBS (Dawid) | **NR17 IoT-NTN (Sergio)**  **- 7.2.1**  **- 7.2.2: offline 104 (CR timer)**  **- 7.2.3: offline 105 (RRC corrections)**  **- 7.2.4**  **- 7.2.5** | EUTRA R17 and earlier, if needed (Tero)  NR17 QoE (Tero) |
| 13:30-14:30 | NR151617 CP, if needed (Johan)  NR17 MGE PRN Other (Johan) | **NR17 NTN (Sergio)**  **- 6.10.1**  **- 6.10.2: offline 101 (UP corrections)**  **- 6.10.3.2.1: offline 102 (SMTC and gaps)**  **- 6.10.3.2.3: offline 103 (Other RRC corrections)**  **- 6.10.3.1** | NR17 Pos (Nathan) |
| 14:30-15:30 | NR18 Mobile IAB (Johan) | **NR17 Cov Enh (Sergio)**  **- 6.19.1**  **- 6.19.2**  **NR17 Redcap (Sergio)**  **- 6.12.1**  **- 6.12.2**  **- 6.12.3** | NR17 SON MDT (HuNan) |
| **Friday** |  |  |  |
| 03:30-04:30 | NR18 Mobility (Johan) | NR18 XR (Tero) | NR18 Enh SL relay (Nathan) |
| 04:30-05:30 | NR18 MBS (Dawid) | **NR18 NR NTN (Sergio)**  **- 8.7.1**  **- 8.7.2**  **- 8.7.3** | NR18 Enh Pos (Nathan) |

WEEK 2:

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** | **Web Conference R2 - BO2** |
| **Monday** |  |  |  |
| 12:30-13:30 | NR18 Mobility (Johan) | NR18 XR (Tero) | NR18 Enh Pos (Nathan) |
| 13:30-14:30 | NR18 Mobility (Johan) | NR18 XR (Tero) | NR18 Enh Pos (Nathan) |
| 14:30-15:30 | NR18 Mobility (Johan) | NR18 QoE (Tero) | NR18 Network Energy Saving (Diana) |
| **Tuesday** |  |  |  |
| 12:30-13:30 | NR18 Other (Johan) | **EUTRA18 IoT NTN (Sergio)**  **- 8.6.2** | NR18 NC repeater (Sasha) |
| 13:30-14:30 | NR18 SONMDT (HuNan) | **EUTRA18 IoT NTN (Sergio)**  **- 8.6.3**  **- 8.6.4** | NR18 UAV (Diana) |
| 14:30-15:30 | NR18 SONMDT (HuNan) | **NR18 NR NTN (Sergio)**  **- 8.7.3**  **- 8.7.4** | NR18 Network Energy Saving (Diana) |
| **Wednesday** |  |  |  |
| 12:30-13:30 | NR18 IDC (Yi) | NR18 XR (Tero) | NR18 Enh SL relay (Nathan) |
| 13:30-14:30 | NR18 IDC (Yi) (+30min if needed)  NR17 MBS CB (Dawid) | NR17 CB (Diana) | NR17 CB (Nathan) |
| 14:30-15:30 | NR17 feMIMO CB (Johan) | NR17 CB (Diana) | NR17 CB (Kyeongin) |
| **Thursday** |  |  |  |
| 03:30-04:30 | NR151617 CP Centric CB (Johan) | **NR17 CB (Sergio)**  **NR NTN: final report of offline 102, 103, 110 and 111** | NR17/EUTRA CB (Tero) |
| 04:30-05:30 | NR17 CB (Johan) | **E17 CB (Sergio)**  **IoT NTN: final report of offline 105, 106, (108)** | NR17 TBD |
| **Friday** |  |  |  |
| 03:30-04:30 | TBD | TBD | TBD |
| 04:30-05:30 | TBD | **NR17 (Sergio)**  **RedCap: final report of offline 114, 115, (113), 117** | TBD |

WEEK 3 (optional):

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** |  |
| **Monday** |  |  |  |
| 12:30 - 15:30 | Related to Late R17 LS ins, if needed | Related to Late R17 LS ins, if needed |  |

List and status of offline email discussions

NOTE: No offline email discussions will be kicked off before Tuesday Aug 16th, 19:00 UTC

* [AT119-e][101][NR-NTN] UP corrections (Interdigital)

Final scope: Update the MAC CR considering the meeting agreements

Final intended outcome: Agreeable MAC CR

Deadline (for companies' feedback): Thursday 2022-08-25 1600 UTC

Deadline (for MAC CR in R2-2208776): Friday 2022-08-26 0400 UTC

Status: Ongoing

* [AT119-e][102][NR-NTN] SMTC and gaps (Intel)

Final scope: Draft UE capability CRs considering the meeting agreements

Final intended outcome: Endorsable UE capability CRs (to be merged in the main capability CRs)

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for UE capability CRs in R2-2208787 and R2-2208788): Friday 2022-08-26 0600 UTC

Status: Ongoing

* [AT119-e][103][NR-NTN] Other RRC corrections (Oppo)

Final scope: Discuss remaining other RRC aspects

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): Thursday 2022-08-25 0000 UTC

Final deadline (for rapporteur's summary in R2-2208782): Thursday 2022-08-25 0200 UTC

Status: Ongoing

* [AT119-e][104][IoT-NTN] CR timer (ZTE)

Initial scope: Discuss corrections related to contention resolution timer (from proposals in R2-2207056, R2-2207351, R2-2207600, R2-2207824, R2-2208563)

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 2022-08-18 0600 UTC

Initial deadline (for rapporteur's summary in R2-2208754): Thursday 2022-08-18 1000 UTC

Status: Closed

* [AT119-e][105][IoT-NTN] RRC corrections (Huawei)

Final scope: Update the RRC CR considering the meeting agreements

Final intended outcome: Agreeable RRC CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for RRC CR in R2-2208784): Friday 2022-08-26 0800 UTC

Status: Ongoing

* [AT119-e][106][IoT-NTN] MAC corrections (Mediatek)

Updated scope: Discuss remaining MAC corrections

Updated 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)

Updated deadline (for companies' feedback): Wednesday 2022-08-24 1800 UTC

Updated deadline (for rapporteur's summary in R2-2208780): Wednesday 2022-08-24 2200 UTC

Status: Ongoing

* [AT119-e][107][IoT-NTN] Idle mode corrections (Ericsson)

Final scope: Draft the 36.304 CR considering the meeting agreements

Final intended outcome: Agreeable 36.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for 36.304 CR in R2-2208781): Friday 2022-08-26 0800 UTC

Status: Ongoing

* [AT119-e][108][IoT-NTN] UE capabilities (Nokia)

Final scope: Draft 36.306 CR considering the meeting agreements

Final intended outcome: Agreeable 36.306 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for 36.306 CR in R2-2208789): Friday 2022-08-26 0600 UTC

Status: Ongoing

* [AT119-e][109][NR-NTN] Stage-2 CR (Thales)

Scope: Draft Stage-2 CR, also considering Stage-2 text proposals in contributions to other AIs

Intended outcome: Agreeable Stage-2 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for rapporteur's summary in R2-2208760 and for Stage-2 CR in R2-2208761): Friday 2022-08-26 1000 UTC

Status: Ongoing

* [AT119-e][110][NR-NTN] Idle mode corrections (ZTE)

Final scope: Update the 38.304 CR considering the meeting agreements

Final intended outcome: Agreeable 38.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for 38.304 CR in R2-2208776): Friday 2022-08-26 0800 UTC

Status: Ongoing

* [AT119-e][111][NR-NTN] RRC corrections (Ericsson)

Updated scope: Discuss remaining RRC corrections

Updated 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)

Updated deadline (for companies' feedback): Wednesday 2022-08-24 1600 UTC

Updated deadline (for rapporteur's summary in R2-2208777): Wednesday 2022-08-24 1800 UTC

Status: Ongoing

* [AT119-e][112][CovEnh] RRC corrections Huawei)

Scope: Update the RRC CR

Intended outcome: Agreeable RRC CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for RRC CR in [R2-22](javascript:void(0);)08768): Friday 2022-08-26 1000 UTC

Status: Ongoing

* [AT119-e][113][RedCap] Stage-2 CR (Nokia)

Scope: Draft Stage-2 CR, also considering Stage-2 text proposals in contributions to other AIs

Intended outcome: Agreeable Stage-2 CR

Deadline (for companies' feedback): Wednesday 2022-08-24 1000 UTC

Deadline (for rapporteur's summary in R2-2208769 and for Stage-2 CR in R2-2208770): Wednesday 2022-08-24 1800 UTC

Status: Ongoing

* [AT119-e][114][RedCap] MAC corrections (vivo)

Updated scope: Discuss remaining MAC corrections

Updated 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)

Updated deadline (for companies' feedback): Thursday 2022-08-25 1200 UTC

Updated deadline (for rapporteur's summary in R2-2208785): Thursday 2022-08-25 1400 UTC

Proposals marked "for agreement" in R2-2208785 not challenged until Friday 2022-08-26 02:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue online).

Status: Ongoing

* [AT119-e][115][RedCap] CP corrections (Ericsson)

Updated scope: Discuss remaining CP corrections

Updated 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)

Updated deadline (for companies' feedback): Thursday 2022-08-25 1600 UTC

Updated deadline (for rapporteur's summary in R2-2208790): Thursday 2022-08-25 2000 UTC

Status: Ongoing

* [AT119-e][116][RedCap] Idle mode CR (Ericsson)

Scope: Draft 38.304 CR, taking into account the relevant agreement from offline 115

Intended outcome: Agreeable 38.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for 38.304 CR in R2-2208773): Friday 2022-08-26 1000 UTC

Status: Not yet started

* [AT119-e][117][RedCap] NCD-SSB corrections (ZTE)

Final scope: Discuss TP related to agreed p1 and continue the discussion on p6 and p8

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): Thursday 2022-08-25 1200 UTC

Final deadline (for rapporteur's summary in R2-2208786): Thursday 2022-08-25 1400 UTC

Proposals marked "for agreement" in R2-2208786 not challenged until Friday 2022-08-26 02:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue online).

Status: Ongoing

* [AT119-e][118][IoT-NTN] Stage-2 CR (Ericsson)

Scope: Draft Stage-2 CR

Intended outcome: Agreeable Stage-2 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for Stage-2 CR in R2-2208762): Friday 2022-08-26 1000 UTC

Status: Ongoing

* [AT119-e][119][IoT-NTN] LS to RAN1 (Mediatek)

Scope: Discuss whether to send an LS to RAN1 to inform of the RAN2 decision for eMTC (on

enabling/disabling HARQ feedback via UE specific RRC signalling), saying that we are still discussing for NB-IoT, and checking if they have any concern with using RRC (in which case we can reconsider)

Intended outcome: LS to RAN1

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for final LS in R2-2208778): Friday 2022-08-26 1000 UTC

Status: Ongoing

* [AT119-e][120][NR-NTN] LS to SA2 (Thales)

Scope: Draft LS to SA2 to inform of the RAN2 assumption on re-use of the LCS framework for the network verification procedure

Intended outcome: LS to SA2

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for final LS in R2-2208779): Friday 2022-08-26 1000 UTC

Status: Ongoing

## 6.10 NR Non-Terrestrial Networks (NTN)

(NR\_NTN\_solutions-Core; leading WG: RAN2; REL-17; WID: [RP-211557](file:///C:\Data\3GPP\archive\RAN\RAN%2392\Tdocs\RP-211557.zip))

Tdoc Limitation: 5 tdocs

### 6.10.1 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.

#### 6.10.1.1 LS in

For LSes that need action: one tdoc by contact company to address the LS and potential reply is considered.

Rapporteur input may be provided.

Measurement gap enhancements

[R2-2206948](file:///C:\Data\3GPP\Extracts\R2-2206948_R4-2210611.docx) Reply LS on measurement gap enhancements for NTN (R4-2210611; contact: Intel) RAN4 LS in Rel-17 NR\_NTN\_solutions, NR\_MG\_enh To:RAN2

* Noted

[R2-2207271](file:///C:\Data\3GPP\Extracts\R2-2207271%20Discussion%20on%20RAN4%20reply%20LS%20on%20measurement%20gaps.docx) Discussion on RAN4 reply LS on measurement gaps Intel Corporation discussion Rel-17 NR\_NTN\_solutions-Core

* Discussed in offline 102

User Consent

[R2-2206968](file:///C:\Data\3GPP\Extracts\R2-2206968_S3-221268.docx) LS reply on Reply LS on NTN specific User Consent and UE location in connected mode in NTN (S3-221268; contact: Ericsson) SA3 LS in Rel-17 NR\_NTN\_solutions-Core To:RAN2 Cc:SA2, RAN3, CT1, CT4

* Noted

Other

[R2-2207067](file:///C:\Data\3GPP\Extracts\R2-2207067%20NTN%20not%20allowed%20PLMN.doc) Discussion on CT1 LS on not allowed PLMN at the current location OPPO discussion Rel-17 NR\_NTN\_solutions-Core

#### 6.10.1.2 Rapporteur inputs

CR Rapporteurs may provide baseline correction CRs containing smaller corrections, text clarifications, etc - please contact the CR rapporteurs before providing contributions on those aspects.

Stage 2

[R2-2207065](file:///C:\Data\3GPP\Extracts\R2-2207065NTN%20stage-2%20correction.docx) NTN Stage-2 correction OPPO, Thales CR Rel-17 38.300 17.1.0 0494 - F NR\_NTN\_solutions-Core

* Revised in R2-2208761
* Continue in offline 109

[R2-2207322](file:///C:\Data\3GPP\Extracts\R2-2207322%20Rel-17%20NTN%20Stage-2%20(Rapporteur)%20corrections.docx) Rel-17 NTN Stage-2 (Rapporteur) corrections Nokia, Nokia Shanghai Bell CR Rel-17 38.300 17.1.0 0509 - F NR\_NTN\_solutions-Core

* Continue in offline 109
* [AT119-e][109][NR-NTN] Stage-2 CR (Thales)

Scope: Draft Stage-2 CR, also considering Stage-2 text proposals in contributions to other AIs

Intended outcome: Agreeable Stage-2 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for rapporteur's summary in R2-2208760 and for Stage-2 CR in R2-2208761): Friday 2022-08-25 1000 UTC

[R2-22](javascript:void(0);)08760 [offline-109] Stage-2 CR Thales discussion Rel-17 NR\_NTN\_solutions-Core

R2-2208761 NTN Stage-2 correction Thales CR Rel-17 38.300 17.1.0 0494 1 F NR\_NTN\_solutions-Core

MAC CR

[R2-2208272](file:///C:\Data\3GPP\Extracts\R2-2208272%20NTN%20Corrections%20for%20TS%2038321_%5bR2-119e%5d.docx) Corrections to Release-17 NR Non-Terrestrial Networks (NTN): RAN2#119e InterDigital CR Rel-17 38.321 17.1.0 1378 - F NR\_NTN\_solutions-Core

* Continue in offline 101
* Revised in R2-2208776

R2-2208776 Corrections to Release-17 NR Non-Terrestrial Networks (NTN): RAN2#119e InterDigital CR Rel-17 38.321 17.1.0 1378 1 F NR\_NTN\_solutions-Core

38.304 CR

[R2-2208329](file:///C:\Data\3GPP\Extracts\R2-2208329_REL-17_CR0277_Miscellaneous%20corrections%20on%2038.304.docx) Miscellaneous corrections on 38.304 ZTE Corporation, Sanechips, CMCC, vivo, Apple CR Rel-17 38.304 17.1.0 0277 - F NR\_NTN\_solutions-Core

* Continue in offline 110
* Revised in R2-2208783

R2-2208783 Miscellaneous corrections on 38.304 ZTE Corporation, Sanechips, CMCC, vivo, Apple CR Rel-17 38.304 17.1.0 0277 1 F NR\_NTN\_solutions-Core

RRC CR

Moved here from 6.0.1

[R2-2207927](file:///C:\Data\3GPP\Extracts\R2-2207927%20-%20R17%20NR%20NTN%20RRC%20Corrections.docx) Corrections for Release-17 NTN RRC  Ericsson          discussion   NR\_NTN\_solutions-Core

[R2-2207924](file:///C:\Data\3GPP\Extracts\R2-2207924%20CR3326%2038331%20Rel-17%20CR%20NTN.docx) Corrections for Release-17 NTN Ericsson CR Rel-17 38.331 17.1.0 3326 - F NR\_NTN\_solutions-Core

* Continue in offline 111

Other

[R2-2207097](file:///C:\Data\3GPP\Extracts\R2-2207097-Rel-17%20NR_NTN_solutions%20WI_Summary_v3.doc) Draft Summary for NR support for Non-Terrestrial Networks (NTN) THALES WI summary Rel-17 NR\_NTN\_solutions

* Revised in [R2-2208925](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208925.zip)

[R2-2208925](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208925.zip) Draft Summary for NR support for Non-Terrestrial Networks (NTN) THALES WI summary Rel-17 NR\_NTN\_solutions

* Revised in [R2-2208935](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208935.zip)

[R2-2208935](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208935.zip) Draft Summary for NR support for Non-Terrestrial Networks (NTN) THALES WI summary Rel-17 NR\_NTN\_solutions

* Noted (Companies are invited to provide further comments directly to Thales, if needed)

### 6.10.2 User Plane

#### 6.10.2.1 MAC corrections

All contributions initially discussed in offline [101]

[R2-2207240](file:///C:\Data\3GPP\Extracts\R2-2207240%206.10.2.1%20TA%20report.docx) Discussion on TA report Samsung Research America discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2207241](file:///C:\Data\3GPP\Extracts\R2-2207241%206.10.2.1%20MAC%20other.docx) Discussion on remaining MAC issues Samsung Research America discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2207443](file:///C:\Data\3GPP\Extracts\R2-2207443_38.321CR1317_NTN%20UL%20synchronization%20correction%20in%20MAC.docx) NTN UL synchronization correction in MAC Apple CR Rel-17 38.321 17.1.0 1317 - F NR\_NTN\_solutions-Core

[R2-2207596](file:///C:\Data\3GPP\Extracts\R2-2207596%20Discussion%20on%20the%20issue%20of%20outdated%20UE%20TA%20at%20NW%20side.doc) Discussion on the issue of outdated UE TA at NW side Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2207598](file:///C:\Data\3GPP\Extracts\R2-2207598%20Correction%20on%20maintenance%20of%20UL%20synchronization%20in%20MAC.docx) Correction on maintenance of UL synchronization in MAC Huawei, HiSilicon CR Rel-17 38.321 17.1.0 1326 - F NR\_NTN\_solutions-Core

[R2-2207628](file:///C:\Data\3GPP\Extracts\R2-2207628%20Remaining%20issue%20on%20UL%20synchronization%20in%20NR%20NTN.docx) Remaining issue on UL synchronization in NR NTN vivo discussion

[R2-2207629](file:///C:\Data\3GPP\Extracts\R2-2207629%20On%20corrections%20to%20random%20access%20procedure%20in%20NR%20NTN.docx) On corrections to random access procedure in NR NTN vivo discussion

[R2-2208273](file:///C:\Data\3GPP\Extracts\R2-2208273%20(R17%20NTN%20WI%20AI%206.10.2.1)%20Msg3%20blind%20retx.docx) Blind Msg3 retransmission in Rel-17 NTN InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2208274](file:///C:\Data\3GPP\Extracts\R2-2208274%20(R17%20NTN%20WI%20AI%206.10.2.1)%20SR%20configuration.docx) SR configuration for Timing Advance MAC CE InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2208275](file:///C:\Data\3GPP\Extracts\R2-2208275%20(R17%20NTN%20WI%20AI%206.10.2.1)%20TAR%20clarifications.docx) Clarifications to the Timing Advance reporting procedure InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2208382](file:///C:\Data\3GPP\Extracts\R2-2208382%20Correction%20on%20TA%20Reporting%20Triggering%20Condition%20for%20NTN%20in%20TS%2038.321.docx) Correction on TA Reporting Triggering Condition for NTN in TS 38.321 CATT CR Rel-17 38.321 17.1.0 1384 - F NR\_NTN\_solutions-Core

[R2-2208560](file:///C:\Data\3GPP\Extracts\R2-2208560%20On%20issues%20for%20Timing%20Advance%20Report%20MAC%20CE.docx) On issues for Timing Advance Report MAC CE Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2208569](file:///C:\Data\3GPP\Extracts\R2-2208569%20On%20remaining%20UP%20issues%20in%20NTN.doc) Remaining UP issues in NTN ZTE Corporation, Sanechips discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2208570](file:///C:\Data\3GPP\Extracts\R2-2208570.docx) Correction to 38321 on TA report ZTE Corporation, Sanechips CR Rel-17 38.321 17.1.0 1391 - F NR\_NTN\_solutions-Core

[R2-2208571](file:///C:\Data\3GPP\Extracts\R2-2208571.docx) Correction to 38321 on ra-ContentionResolutionTimer ZTE Corporation, Sanechips CR Rel-17 38.321 17.1.0 1392 - F NR\_NTN\_solutions-Core

[R2-2208576](file:///C:\Data\3GPP\Extracts\R2-2208576%2038.321%20cr%20Clarification%20on%20the%20condition%20of%20contention%20resolution%20not%20successful.docx) Clarification on the condition of contention resolution not successful Xiaomi CR Rel-17 38.321 17.1.0 1393 - F NR\_NTN\_solutions-Core

[R2-2208675](file:///C:\Data\3GPP\Extracts\R2-2208675%20-%20R17%20NR%20NTN%20User%20Plane%20issues.docx) R17 NR NTN User Plane issues Ericsson discussion Rel-17

* [AT119-e][101][NR-NTN] UP corrections (Interdigital)

Initial scope: Discuss UP corrections based on contributions in 6.10.2

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 2022-08-18 0200 UTC

Initial deadline (for rapporteur's summary in [R2-2208751](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208751.zip)): Thursday 2022-08-18 1000 UTC

Updated scope: Discuss remaining UP corrections

Updated 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)

Updated deadline (for companies' feedback): Monday 2022-08-22 1200 UTC

Updated deadline (for rapporteur's summary in [R2-2208763](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208763.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208763](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208763.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Update the MAC CR considering the meeting agreements

Final intended outcome: Agreeable MAC CR

Deadline (for companies' feedback): Thursday 2022-08-25 1600 UTC

Deadline (for MAC CR in R2-2208776): Friday 2022-08-26 0400 UTC

[R2-2208751](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208751.zip) [offline-101] UP Corrections InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

4Likely agreeable

Proposal 3: If timingAdvanceSR is configured with value enabled and a dedicated SR configuration is not available (e.g. not supported or not provided by the network), UE selects between any available SR configuration. (14/17)

* IDC thinks this is not needed, after agreeing p2. QC agrees we already agreed on this but thinks it’s not clear from the spec
* Clarify in MAC that if timingAdvanceSR is configured with value enabled, the UE selects between any available SR configuration

Proposal 4: Use of ‘Serving Cell’ is clarified in TS 38.321: Section 5.2a. FFS detailed text.

* Agreed

Proposal 5: Reference to RRC specification in TS 38.321: Section 5.2a to be revisited/reviewed during [POST119-e] MAC CR review. (15/17)

* Agreed

Proposal 9: In Section 3.1 of TS 38.321, remove “provided in NTN-Config” from UE-gNB RTT definition. (consensus)

* Agreed

Proposal 10: Remove “, https://gis-lab.info/docs/nima-tr8350.2-wgs84fin.pdf” from reference 51 in 38.300. (consensus)

* Agreed

Requires discussion

Proposal 1: Blind Msg3 retransmission is not supported for initial Msg3 transmission in Rel-17 NTN. (13/17)

* Ericsson can accept this in the interest of progress
* Agreed

Proposal 2: Dedicated SR configuration for TAR MAC CE is not supported. (12/17)

* Agreed

Proposal 7: If RAN2 agrees outdated TA needs to be addressed in Rel-17, it is via TA reporting triggered by NW request. (6/17)

* For P7, HW understand companies don’t want to revert any agreements or a complicated solution. But the outdated TA is an issue that is not rare so we cannot ignore, as this will affect gNB scheduling. HW don’t see how gNB can handle this by guessing or predicting. If it is difficult to know whether a TAR is succeeded, then it is better that we make sure the reliability is TAR is sufficient. To prevent the issue being blocked by only one solution, we suggest to make it a little more open:

Proposal 7: RAN2 to discuss whether the outdated TA needs to be addressed.

* HW also have some sympathy on P2 in R2-2208275 which can avoid potential ambiguity of UE behavior by a simple NOTE. Hope this can be further discussed in Phase 2.
* Discuss P2 from R2-2208275 in phase 2 of offline 101
* IDC thinks the most popular option is to do nothing.
* Oppo thinks we don’t need a new mechanism. In case the NW can configure a larger Koffset. Ericsson and LGE agree. IDC agree. CATT/Apple also agree
* Nokia agrees with HW that something is needed but are open on the solution. QC has some similar view. Configuring a larger Koffset means deconfiguring Koffset
* VC thinks that we could consider possible enhancements in Rel-18 (but will not discuss this unless the WID is updated)
* Nokia can follow the majority view
* Further enhancements to address outdated TA will not be addressed in Rel-17.

Continue in Phase 2

Proposal 6: RAN2 to continue discussion on Issue 3: Cancelling triggered BSR/RACH procedure after UL sync is regained if no pending data.

* Continue offline

Proposal 8: RAN2 to continue discussing the following options to support TA reporting triggered by NW request:

1) via RACH by intra-cell handover, i.e., handover to the current serving cell

2) via RACH by PDCCH order, and ta-Report enabled in SIB19 is used to indicate TA report is requested in RACH by PDCCH order

3) via RACH by PDCCH order, and an indication in DCI is used to indicate TA report is requested in RACH by PDCCH order

* No longer needed

Proposal 11: Discuss CR in R2-2208382 in subsequent offline phase.

* Continue in offline

Agreements:

1. Clarify in MAC that if timingAdvanceSR is configured with value enabled, the UE selects between any available SR configuration
2. Use of ‘Serving Cell’ is clarified in TS 38.321: Section 5.2a. FFS detailed text.
3. Reference to RRC specification in TS 38.321: Section 5.2a to be revisited/reviewed during MAC CR review.
4. In Section 3.1 of TS 38.321, remove “provided in NTN-Config” from UE-gNB RTT definition
5. Remove “, https://gis-lab.info/docs/nima-tr8350.2-wgs84fin.pdf” from reference 51 in 38.300.
6. Blind Msg3 retransmission is not supported for initial Msg3 transmission in Rel-17 NTN.
7. Dedicated SR configuration for TAR MAC CE is not supported.
8. Further enhancements to address outdated TA will not be addressed in Rel-17.

[R2-2208763](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208763.zip) [offline-101] UP Corrections – second round InterDigital discussion Rel-17 NR\_NTN\_solutions-Core

For email agreement

Proposal 1: The text proposal from R2-2208763: Question 1 (i.e. clarifying SR configuration selection for TA reporting) is agreed and included in NTN MAC rapporteur CR. (consensus)

* Agreed

Proposal 2: The Option 1 text proposal from R2-2208763: Question 2 (i.e. clarifying use of Serving Cell in UL synchronization procedure) is agreed and included in NTN MAC rapporteur CR. (14/18)

* Agreed

Proposal 3: The text proposal from R2-2208382 is agreed and included in NTN MAC rapporteur CR. (consensus)

* Agreed

Proposal 4: The following text proposal is agreed as baseline and is included in NTN MAC rapporteur CR:

“A MAC PDU shall contain at most one Timing Advance Report MAC CE, even when multiple events have triggered a Timing Advance report. The Timing Advance Report MAC CE shall be generated based on the current estimate of TA value at the time of MAC PDU assembly.”

* Ericsson thinks p4 is still ambiguous. What current estimate? The estimate of TA used to transmit at the time of PDU assembly, or the current estimate of what the TA will be at the time of transmission of the PDU being assembled? They can be different if time is long between PDU assembly and transmission. Suggests to rewords as: “The Timing Advance Report MAC CE, generated at the time of PDU assembly, shall be based on the current estimate of the TA value to be used for the first PDU transmission.”
* HW prefers the rapporteur’s wording. HW thinks it is unlikely UE would assembly the PDU long before the transmission. So the reported value should be up to the MAC PDU assembly similar as BSR. It shouldn’t be a predicted value as UE may move which cannot be predicted. If there is really the case that the TA value is invalid (which is unlikely from our perspective), the UE can anyway trigger another TAR based on the threshold.
* Ericsson can accept the current wording of p4
* Agreed

#### 6.10.2.2 Other

Contributions on any other UP issues.

All contributions initially discussed in offline [101]

[R2-2207052](file:///C:\Data\3GPP\Extracts\R2-2207052-%20left%20issues%20on%20UP%20in%20NTN.doc) left issues on UP in NTN OPPO discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2207341](file:///C:\Data\3GPP\Extracts\R2-2207341%20TA%20report.doc) Outdated UE specific Koffset Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2207671](file:///C:\Data\3GPP\Extracts\R2-2207671%20Discussion%20on%20the%20RA%20counter%20in%20case%20of%20ephemeris%20update.doc) Discussion on the RA counter in case of ephemeris update Spreadtrum Communications discussion Rel-17

[R2-2208561](file:///C:\Data\3GPP\Extracts\R2-2208561%20On%20Msg3%20blind%20retransmission%20and%20UE%20behaviour%20upon%20validity%20timer%20expiry.docx) On Msg3 blind retransmission and UE behaviour upon validity timer expiry Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_NTN\_solutions-Core

[R2-2208678](file:///C:\Data\3GPP\Extracts\R2-2208678%20-%20R17%20NR%20NTN%20stage%202%20corrections.docx) R17 NR NTN stage 2 corrections Ericsson discussion Rel-17

### 6.10.3 Control Plane

#### 6.10.3.1 Idle inactive mode corrections

Contributions on 38.304 impacts.

[R2-2207323](file:///C:\Data\3GPP\Extracts\R2-2207323%20Rel-17%20NTN%20IDLE%20mode%20corrections.docx) Rel-17 NTN IDLE mode corrections Nokia, Nokia Shanghai Bell CR Rel-17 38.304 17.1.0 0258 - F NR\_NTN\_solutions-Core

* Continue in offline 110

[R2-2207440](file:///C:\Data\3GPP\Extracts\R2-2207440_38.304CR0260_(Rel-17)_Clarification%20on%20the%20suitable%20cell%20in%20NTN_v0.docx) Clarification on the suitable cell in NTN Apple CR Rel-17 38.304 17.1.0 0260 - F NR\_NTN\_solutions-Core

* Continue in offline 110

[R2-2207632](file:///C:\Data\3GPP\Extracts\R2-2207632%20Clarification%20on%20time-based%20cell%20reselection%20in%20TS%2038.304.docx) Clarification on time-based cell reselection in TS 38.304 vivo CR Rel-17 38.304 17.1.0 0266 - F NR\_NTN\_solutions-Core

* Continue in offline 110

[R2-2207863](file:///C:\Data\3GPP\Extracts\R2-2207863.docx) Discussion on the acquisition and prediction of ephemeris for SIB19 BUPT discussion Rel-17

* Continue in offline 110

[R2-2208094](file:///C:\Data\3GPP\Extracts\R2-2208094%20-%20R17%20NR%20NTN%20Idle%20mode%20issues.docx) R17 NR NTN Idle mode corrections Ericsson discussion NR\_NTN\_solutions-Core

* Continue in offline 110

[R2-2208137](file:///C:\Data\3GPP\Extracts\R2-2208137.docx) Correction on Measurement rules for cell re-selection for NR NTN Samsung R&D Institute UK CR Rel-17 38.304 17.1.0 0272 - F NR\_NTN\_solutions-Core

* Continue in offline 110

[R2-2208379](file:///C:\Data\3GPP\Extracts\38.304_CR0278(Rel-17)_R2-2208379%20%7fMiscellaneous%20corrections%20on%2038.304.docx) Miscellaneous corrections on 38.304 CATT CR Rel-17 38.304 17.1.0 0278 - F NR\_NTN\_solutions-Core

* Continue in offline 110
* [AT119-e][110][NR-NTN] Idle mode corrections (ZTE)

Initial scope: Discuss idle mode corrections

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): Monday 2022-08-22 1200 UTC

Initial deadline (for rapporteur's summary in [R2-2208764](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208764.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208764](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208764.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Update the 38.304 CR considering the meeting agreements

Final intended outcome: Agreeable 38.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for 38.304 CR in R2-2208776): Friday 2022-08-26 0800 UTC

[R2-2208764](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208764.zip) [offline-110] idle mode corrections ZTE Corporation discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1: Revise R2-2208329 to include the following changes and agree the revision.

- If distanceThresh is broadcasted in SIB19, and if UE supports location-based measurement initiation and has obtained its location information:

- If the distance between UE and the serving cell reference location referenceLocation is shorter than distanceThresh, the UE may not perform intra-frequency measurements;

- If distanceThresh is broadcasted in SIB19, and if UE supports location-based measurement initiation and has valid UE location information:

- If the distance between UE and the serving cell reference location referenceLocation is shorter than distanceThresh, the UE may choose not to perform measurements of NR inter-frequency cells of equal or lower priority, or inter-RAT frequency cells of lower priority;

* Agreed

Proposal 2: Agree all the changes in R2-2207323.

* Agreed

Proposal 3: The proposed change in R2-2207440 is not pursued.

* Agreed

Proposal 4: Revise R2-2207632 as follows and agree the revision.

If the t-Service of the serving cell is present in SIB19, and if UE supports ~~cell stop-~~time-based neighbour cell measurements, the UE shall perform intra-frequency, inter-frequency or inter-RAT measurements before the t-Service, regardless of the distance between UE and the serving cell reference location or whether the serving cell fulfils Srxlev > SIntraSearchP and Squal > SIntraSearchQ, or Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ and the exact time to start measurement before t-Service is up to UE implementation. UE shall perform measurements of higher priority NR inter-frequency or inter-RAT frequencies according to TS 38.133 [8] regardless of the remaining service time of the serving cell (i.e. time remaining until t-Service).

* Samsung thinks the wording should be aligned with P1 (location-based measurement initiation) by updating to “… and if UE supports time-based measurement initiation …”. And if this change is agreed, the corresponding UE capability should be specified.
* Intel suggests to have a P4a for online discussion:

“Proposal 4a: Introduce an optional capability without signalling for time-based measurement initiation, and merge it to NR NTN UE capability rapporteur CR.”

* HW has some concern on P4 with regard to adding an optional UE capability. For location-based measurement initiation, we understand that the capability cannot be made mandatory as initiating GNSS fixes in IDLE mode brings power consumption and may not be desired by some companies. However, if time-based measurement is also made optional, and the UE implements neither location-based nor time-based measurement, the overall performance will be degraded as the legacy RSRP-based measurement/reselection does not work well in NTN. Therefore we hope companies can consider taking the time-based measurement initiation as an mandatory feature, as there is no clear motivation for NTN UEs to not implement the feature.
* Vivo thinks we already agreed to have time-based cell reselection feature as an optional UE feature (w/o signaling). So our proposed change to TS 38.304 is just to follow/reflect this agreement, similar to the description on the location-based cell reselection.
* Ericsson/Oppo also supports to capture the time-based measurement as an optional UE feature (w/o signaling).
* Discuss online whether to confirm time-based measurement initiation as an optional feature and whether to introduce an optional capability without signaling for this, merge into NR NTN UE capability rapporteur CR and agree the change to 38.304 by adding "and if UE supports time-based measurement initiation".

Proposal 5: The proposed change in R2-2208137 is not pursued.

* Agreed

Proposal 6: The proposals in R2-2207863 are not pursued.

* Agreed

Agreements via email – from offline 110:

1. Revise R2-2208329 to include the changes as in suggested in the conclusions of R2-220876 .

2. Agree all the changes in R2-2207323.

3. The proposed change in R2-2207440 is not pursued.

4. The proposed change in R2-2208137 is not pursued.

5. The proposals in R2-2207863 are not pursued.

#### 6.10.3.2 RRC corrections

##### 6.10.3.2.1 SMTC and gaps

SMTC and gaps related corrections

Two concurrent gaps for one frequency layer

Moved here from 6.10.3.2.3

[R2-2207068](file:///C:\Data\3GPP\Extracts\R2-2207068%20NTN%2038.306%20CR.docx) Correction on NTN UE capabiltiy OPPO CR Rel-17 38.306 17.1.0 0758 - F NR\_NTN\_solutions-Core

* Discussed in offline 102

[R2-2207149](file:///C:\Data\3GPP\Extracts\R2-2207149%20Remaining%20issues%20on%20SMTCs%20and%20gaps.doc) Remaining issues on SMTCs and gaps Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

* Discussed in offline 102

[R2-2207243](file:///C:\Data\3GPP\Extracts\R2-2207243%206.10.3.2.1%20331%20CR%20for%20SMTC.docx) Draft 331 CR for NR NTN SMTC Samsung Research America draftCR Rel-17 38.331 17.1.0 F NR\_NTN\_solutions-Core

* Discussed in offline 102

Moved here from 6.10.3.2.3

[R2-2207268](file:///C:\Data\3GPP\Extracts\R2-2207268%20Draft%20331%20CR%20for%20NR%20NTN%20measurement%20related%20UE%20capabilities.docx) Draft 331 CR for NR NTN measurement related UE capabilities Intel Corporation draftCR Rel-17 38.331 17.1.0 F NR\_NTN\_solutions-Core

* Discussed in offline 102

[R2-2207269](file:///C:\Data\3GPP\Extracts\R2-2207269%20Draft%20306%20CR%20for%20NR%20NTN%20measurement%20related%20UE%20capabilities.docx) Draft 306 CR for NR NTN measurement related UE capabilities Intel Corporation draftCR Rel-17 38.306 17.1.0 F NR\_NTN\_solutions-Core

* Discussed in offline 102

[R2-2207270](file:///C:\Data\3GPP\Extracts\R2-2207270%20Discussion%20on%20UE%20capability%20for%202%20SMTC%20in%20parallel.docx) Discussion on UE capability for 2 SMTC in parallel Intel Corporation discussion Rel-17 NR\_NTN\_solutions-Core

* Discussed in offline 102

[R2-2208214](file:///C:\Data\3GPP\Extracts\R2-2208214%20Correction%20to%20associate%20two%20concurrent%20measurement%20gaps%20to%20one%20frequency%20layer%20for%20NR%20NTN.docx) Correction to associate two concurrent measurement gaps to one frequency layer for NR NTN Nokia, Nokia Shanghai Bell CR Rel-18 38.331 17.1.0 3382 - F NR\_NTN\_solutions-Core

* Discussed in offline 102

[R2-2208466](file:///C:\Data\3GPP\Extracts\R2-2208466%2038331%20draftCR%20Correction%20for%20measurement%20gap.docx) Correction for measurement gap Xiaomi draftCR Rel-17 38.331 17.1.0 NR\_NTN\_solutions-Core

* Discussed in offline 102
* [AT119-e][102][NR-NTN] SMTC and gaps (Intel)

Initial scope: Discuss corrections related to remaining SMTC and gaps issues (from proposals in R2-2207068, R2-2207149, R2-2207243, R2-2207268, R2-2207269, R2-2207270, R2-2207271, R2-2208214, R2-2208466)

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 2022-08-18 0600 UTC

Initial deadline (for rapporteur's summary in R2-2208752): Thursday 2022-08-18 1000 UTC

Updated scope: Discuss remaining SMTC and gaps corrections

Updated 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)

Updated deadline (for companies' feedback): Monday 2022-08-22 2200 UTC

Updated deadline (for rapporteur's summary in R2-2208765): Tuesday 2022-08-23 0400 UTC

Proposals marked "for agreement" in R2-2208765 not challenged until Tuesday 2022-08-23 16:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Draft UE capability CRs considering the meeting agreements

Final intended outcome: Endorsable UE capability CRs (to be merged in the main capability CRs)

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for UE capability CRs in R2-2208787 and R2-2208788): Friday 2022-08-26 0600 UTC

[R2-2208752](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208752.zip) [offline-102] SMTC and gaps Intel Corporation discussion Rel-17 NR\_NTN\_solutions-Core

List of proposals for agreement

- Related to RRC spec:

Proposal 1: RAN2 to capture in TS 38.331 RAN4 agreement that one frequency layer and two concurrent measurement gaps with the same gap type can be associated, i.e., associatedMeasGapSSB2 and associatedMeasGapCSIRS2 within IE MeasObjectNR.

* QC thinks whether this is same gap “type” or “ID”. HW thinks gap type is correct, gap ID is not
* Agreed

Proposal 6: the spec change on smtc4list related description in clause 5.5.2.10 of 38.331 in CR R2-2207243 is merged to NR NTN RRC Rapporteur CR.

* Agreed

Proposal 7: For UEs in RRC\_CONNECTED, the SMTC configured by the NW can be directly used by the UE, i.e., no need to add the PDD (service link propagation delay difference) to the configured offset.

* Agreed

- Related to UE capability:

Proposal 2: RAN2 to confirm if a UE supports 25-3 in RAN4 feature list (i.e., parallelMeasurementGap-r17), it also supports the association between one frequency layer and two measurement gaps with the same gap type.

* Agreed

Proposal 4: RAN2 agreement is updated to align with RAN4 agreement, i.e., “2 SMTC-s on a single frequency carrier” is mandatory for both GSO capable UE and NGSO capable UE. No additional spec change is needed as it has been captured in the latest mega UE capability CR R2-2207276.

* Mediatek thinks we could make support of 2 SMTC optional for GSO but is ok to compromise
* Agreed

Proposal 5: the draft CR R2-2207268 and R2-2207269 can be adopted as baseline for specifying the UE capability for service link propagation delay difference report.

* Agreed

List of proposals that require online discussions

Proposal 3: if P2 is agreed, RAN2 to further discuss whether further clarification in TS 38.306 is needed, e.g.,

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| parallelMeasurementGap-r17  Indicates whether the UE supports 2 parallel measurement gaps for NTN RRM measurements. If a UE does not include this field but includes nonTerrestrialNetwork-r17, the UE supports 1 measurement gap for NTN RRM measurements. If this parameter is indicated, a UE shall also support that two parallel measurement gaps with the same gap type can be associated to one frequency layer. | UE | No | FDD only | FR1 only |

* Continue offline

Proposal 8: For UEs in RRC\_CONNECTED, to assist the NW adjust SMTC, which option can be agreeable:

- Option 1: PDD reporting is sufficient, and no need to further optimize.

- Option 2: UE reports SFTD only once, and report PDD in an event-triggered manner subsequently.

* Continue offline

Proposal 9: for the number of SMTC configured in SIB2/4, which option can be agreeable:

- Option 1: the NW can broadcast at most 2 SMTCs per frequency.

- Option 2: it’s possible to configure up to 4 SMTCs per frequency.

- Option 3: one SMTC is sufficient, as UE can just use the offset in smtc in SIB2/SIB4 as default value, and derive UE specific SMTC offsets for different neighbour cells.

* Continue offline

Proposal 10: the broadcast SMTC in SIB2/4 assumes PDD = X ms. The exact value of X is FFS, e.g., PDD=0 or PDD at reference location.

* Continue offline

Proposal 11: “The UE reports the calculated SMTC offset upon entering RRC\_CONNCTED” is not pursued.

* Continue offline

Agreements:

1. RAN2 to capture in TS 38.331 RAN4 agreement that one frequency layer and two concurrent measurement gaps with the same gap type can be associated, i.e., associatedMeasGapSSB2 and associatedMeasGapCSIRS2 within IE MeasObjectNR.
2. the spec change on smtc4list related description in clause 5.5.2.10 of 38.331 in CR R2-2207243 is merged to NR NTN RRC Rapporteur CR.
3. For UEs in RRC\_CONNECTED, the SMTC configured by the NW can be directly used by the UE, i.e., no need to add the PDD (service link propagation delay difference) to the configured offset.
4. RAN2 to confirm if a UE supports 25-3 in RAN4 feature list (i.e., parallelMeasurementGap-r17), it also supports the association between one frequency layer and two measurement gaps with the same gap type.
5. RAN2 agreement is updated to align with RAN4 agreement, i.e., “2 SMTC-s on a single frequency carrier” is mandatory for both GSO capable UE and NGSO capable UE. No additional spec change is needed as it has been captured in the latest mega UE capability CR R2-2207276.
6. the draft CR R2-2207268 and R2-2207269 can be adopted as baseline for specifying the UE capability for service link propagation delay difference report.

[R2-2208765](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208765.zip) [offline-102] SMTC and gaps – second round Intel Corporation discussion Rel-17 NR\_NTN\_solutions-Core

List of proposals for agreement

Related to RRC spec:

(13/14)Proposal 2: Regarding “how to assist the NW adjust SMTC for UEs in RRC\_CONNECTED”, PDD reporting is sufficient, and no need to further optimize in Rel-17.

* Agreed

(11/14) Proposal 4: the broadcast SMTC in SIB2/4 assumes PDD = 0 ms.

* Agreed

(13/14)Proposal 5: “The UE reports the calculated SMTC offset upon entering RRC\_CONNCTED” is not pursued in Rel-17.

* Agreed

(13/14)Proposal 9: the change proposed by R2-2207344 is NOT agreed.

* Agreed

(13/14)Proposal 10: the changes proposed by R2-2207345 are NOT agreed.

* Agreed

Related to UE capability:

(14/14)Proposal 1: regarding “if a UE supports 25-3 in RAN4 feature list (i.e., parallelMeasurementGap-r17), it also supports the association between one frequency layer and two measurement gaps with the same gap type”, the following clarification in TS 38.306 is agreed and merged to NR NTN UE capability rapporteur CR:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| parallelMeasurementGap-r17  Indicates whether the UE supports 2 parallel measurement gaps for NTN RRM measurements. If a UE does not include this field but includes nonTerrestrialNetwork-r17, the UE supports 1 measurement gap for NTN RRM measurements. If this parameter is indicated, a UE shall also support that two parallel measurement gaps with the same gap type can be associated to one frequency layer. | UE | No | FDD only | FR1 only |

* Agreed

(14/14)Proposal 6: the first change in R2-2208537 is agreed, and merged to NR NTN UE capability rapporteur CR, i.e., “In the description of nonTerrestrialNetwork-r17, “i.e.,” is replaced by “e.g.,””.

* Agreed

(10/14)Proposal 7: the second change in R2-2208537 is agreed, and merged to NR NTN UE capability rapporteur CR, i.e., “In the description of parallelMeasurementGap-r17, it is added that UE supporting this feature shall also indicate the support of nonTerrestrialNetwork-r17”

* Agreed

(14/14)Proposal 8: the change proposed by R2-2208679 is agreed, and merged to NR NTN UE capability rapporteur CR, i.e., “Introduce an optional capability without signalling for location-based measurement initiation”.

* Agreed

List of proposals that require online discussions

(9/14) Proposal 3: the NW can broadcast at most 2 SMTCs per frequency in SIB2/4.

* Continue online

Agreements via email – from offline 102:

Related to RRC spec:

1. Regarding “how to assist the NW adjust SMTC for UEs in RRC\_CONNECTED”, PDD reporting is sufficient, and no need to further optimize in Rel-17.
2. the broadcast SMTC in SIB2/4 assumes PDD = 0 ms.
3. “The UE reports the calculated SMTC offset upon entering RRC\_CONNCTED” is not pursued in Rel-17.
4. the change proposed by R2-2207344 is NOT agreed.
5. the changes proposed by R2-2207345 are NOT agreed.

Related to UE capability:

1. regarding “if a UE supports 25-3 in RAN4 feature list (i.e., parallelMeasurementGap-r17), it also supports the association between one frequency layer and two measurement gaps with the same gap type”, the following clarification in TS 38.306 is agreed and merged to NR NTN UE capability rapporteur CR: “*parallelMeasurementGap-r17:* Indicates whether the UE supports 2 parallel measurement gaps for NTN RRM measurements. If a UE does not include this field but includes *nonTerrestrialNetwork-r17*, the UE supports 1 measurement gap for NTN RRM measurements. If this parameter is indicated, a UE shall also support that two parallel measurement gaps with the same gap type can be associated to one frequency layer.”
2. the first change in R2-2208537 is agreed, and merged to NR NTN UE capability rapporteur CR, i.e., “In the description of nonTerrestrialNetwork-r17, “i.e.,” is replaced by “e.g.,””.
3. the second change in R2-2208537 is agreed, and merged to NR NTN UE capability rapporteur CR, i.e., “In the description of parallelMeasurementGap-r17, it is added that UE supporting this feature shall also indicate the support of nonTerrestrialNetwork-r17”
4. the change proposed by R2-2208679 is agreed, and merged to NR NTN UE capability rapporteur CR, i.e., “Introduce an optional capability without signalling for location-based measurement initiation”.

[R2-2207242](file:///C:\Data\3GPP\Extracts\R2-2207242%206.10.3.2.1%20SMTC%20discussion.docx) Discussion on SMTC related issues Samsung Research America discussion Rel-17 NR\_NTN\_solutions-Core

* Continue in offline 102

[R2-2207344](file:///C:\Data\3GPP\Extracts\38331_CR3251_(Rel-17)_R2-2207344%20Boundary%20alignment.docx) Correction to the frame boundary alignment indication from the source Qualcomm Incorporated CR Rel-17 38.331 17.1.0 3251 - F NR\_NTN\_solutions-Core

* Continue in offline 102

[R2-2207345](file:///C:\Data\3GPP\Extracts\38331_CR3252_(Rel-17)_R2-2207345%20Report%20SMTC%20error.docx) Reporting SMTC issue in measurement results Qualcomm Incorporated CR Rel-17 38.331 17.1.0 3252 - F NR\_NTN\_solutions-Core

* Continue in offline 102

##### 6.10.3.2.2 CHO

CHO related corrections

[R2-2207672](file:///C:\Data\3GPP\Extracts\R2-2207672%20Discussion%20on%20the%20ephemeris%20information%20in%20CHO%20procedure.doc) Discussion on the ephemeris information in CHO procedure Spreadtrum Communications discussion Rel-17

* Noted (no TP)

[R2-2208534](file:///C:\Data\3GPP\Extracts\38.331_CR3433_Rel-17_R2-2208534%20Correction%20of%20entering%20and%20leaving%20condition%20of%20CondEventT1.docx) Correction of entering and leaving condition of CondEventT1 LG Electronics France CR Rel-17 38.331 17.1.0 3433 - F NR\_NTN\_solutions-Core

* Continue in offline 111

##### 6.10.3.2.3 Other

Contributions on any other RRC issues.

Validity timer for neighbour cells

[R2-2207053](file:///C:\Data\3GPP\Extracts\R2-2207053-%20Correction%20to%20RRC-MAC%20interaction%20on%20UL%20synchronisation%20in%20NTN.doc) Correction to RRC-MAC interaction on UL synchronisation in NTN OPPO CR Rel-17 38.331 17.1.0 3212 - F NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2207063](file:///C:\Data\3GPP\Extracts\R2-2207063%20Discussion%20on%20how%20to%20handle%20the%20validity%20timer%20for%20neighbor%20cells.doc) Discussion on how to handle the validity timer for neighbor cells OPPO discussion Rel-17 NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2207066](file:///C:\Data\3GPP\Extracts\R2-2207066%20NTN%20RRC%20correction.docx) NTN RRC correction OPPO CR Rel-17 38.331 17.1.0 3214 - F NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2207441](file:///C:\Data\3GPP\Extracts\R2-2207441_The%20impact%20on%20HO%20by%20the%20validity%20of%20the%20UL%20sync%20assistance%20info_v0.doc) The impact on HO by the validity of the UL sync assistance info Apple discussion Rel-17 NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2207631](file:///C:\Data\3GPP\Extracts\R2-2207631%20Remaining%20issues%20on%20validity%20timer%20in%20NR%20NTN.docx) Remaining issues on validity timer in NR NTN vivo discussion

* Discussed in offline 103

[R2-2208362](file:///C:\Data\3GPP\Extracts\R2-2208362%20Discussion%20on%20validity%20timer%20for%20serving%20cell%20and%20neighbour%20cell.docx) Discussion on validity timer for serving cell and neighbour cell ASUSTeK discussion Rel-16 38.331 NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2208363](file:///C:\Data\3GPP\Extracts\R2-2208363%20Discussion%20on%20T430%20for%20handover.docx) Discussion on T430 for handover ASUSTeK discussion Rel-16 38.331 NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2208378](file:///C:\Data\3GPP\Extracts\R2-2208378%20Discussion%20on%20Neighbor%20Satellite%20Assistance%20Information.docx) Discussion on Neighbor Satellite Assistance Information CATT discussion Rel-17 NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2208657](file:///C:\Data\3GPP\Extracts\R2-2208657_Issues%20related%20to%20NR%20NTN%20epoch%20time.docx) Issues related to NR NTN epoch time Sequans Communications discussion Rel-17 38.331 NR\_NTN\_solutions-Core

* Discussed in offline 103

[R2-2208659](file:///C:\Data\3GPP\Extracts\R2-2208659_NTN%20Configuration%20at%20Handover%20and%20CHO.docx) NTN Configuration at Handover and CHO Sequans Communications discussion Rel-17 38.331 NR\_NTN\_solutions-Core

* Discussed in offline 103
* [AT119-e][103][NR-NTN] Other RRC corrections (Oppo)

Initial scope: Discuss corrections related to validity timer (from proposals in R2-2207053, R2-2207063, R2-2207066, R2-2207631, R2-2208362, R2-2208363, R2-2208378, R2-2208657, R2-2208659)

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 2022-08-18 0600 UTC

Initial deadline (for rapporteur's summary in R2-2208753): Thursday 2022-08-18 1000 UTC

Updated scope: Discuss remaining aspects of validity timer, TA report ([R2-2207769](file:///C:\Data\3GPP\Extracts\38331_CR3311_(Rel-17)_R2-2207769%20Corrections%20to%20TA%20Report%20in%20RRC%20Connection%20Reestablishment.docx), [R2-2207777](file:///C:\Data\3GPP\Extracts\38331_CR3313_(Rel-17)_R2-2207777%20Corrections%20to%20TA%20Report%20in%20RRC%20Connection%20Resume.docx), [R2-2208577](file:///C:\Data\3GPP\Extracts\R2-2208577%2038.331%20cr%20correction%20on%20triggering%20TA%20report%20during%20HO.docx)) and harq-ProcessNumberSizeDCI-0-2 ([R2-2208364](file:///C:\Data\3GPP\Extracts\R2-2208364%20Discussion%20on%20configuration%20of%20harq-ProcessNumberSizeDCI-0-2.docx))

Updated 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)

Updated deadline (for companies' feedback): Monday 2022-08-22 1200 UTC

Updated deadline (for rapporteur's summary in [R2-2208766](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208766.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208766](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208766.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Discuss remaining other RRC aspects

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): Thursday 2022-08-25 0000 UTC

Final deadline (for rapporteur's summary in R2-2208782): Thursday 2022-08-25 0200 UTC

[R2-2208753](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208753.zip) [Offline-103] Other RRC corrections OPPO discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1: (15/19) It is left to UE implementation on how UEs in RRC\_IDLE/RRC\_INACTIVE re-acquire SIB19 for serving cell’s satellite assistance information.

* Agreed

Proposal 2: (13/19) Wait for RAN1 to conclude regarding when ephemeris/common TA is considered as valid

* Agreed

Proposal 3: (17/19) UE (re)starts T430 with the duration ntn-UlSyncValidityDuration from the subframe indicated by epochTime in NTN-Config upon applying target cell configuration.

* Continue offline

Proposal 4: (13/18) If target cell NTN-config from SIB19 is used, UE should (re)start validity timer upon CHO execution according to the target cell NTN-config EpochTime/validity duration.

* Continue offline

Proposal 5: (16/18) Wait for RAN1 to conclude the discussion on epochTime being a future time after the end of current ntn-UlSyncValidityDuration.

* Agreed

Proposal 6: (10/17) Do not revert RAN1 agreement on epoch time “the reference point for epoch time of the serving satellite ephemeris and Common TA parameters is the uplink time synchronization reference point”.

* Sequans thinks that the behaviour is not clear from the specs and should be clarified.
* Ericsson thinks it’s clear in the Stage 2 what the reference point is and the field description of the Epoch time is already clear
* RAN2 confirms the understanding that “the reference point for epoch time of the serving satellite ephemeris and Common TA parameters is the uplink time synchronization reference point”.

Proposal 7: (12/19) UE in RRC\_CONNECTED mode does not maintain validity timer for neighbour cells.

* Continue offline

Proposal 8: RAN2 to discuss whether UE in RRC\_IDLE/RRC\_INACTIVE mode needs to maintain validity timer for neighbour cells.

* Continue offline

Proposal 9: (11/18) If validity timer is maintained for neighbour cells, UE maintains one validity timer for serving cell and separate validity timer for each neighbour cell, according to the corresponding validity duration and epoch time.

* Continue offline

Proposal 10: (14/14) T430 is maintained cell specific if validity timer is maintained for neighbour cells and separate from serving cell.

* Continue offline

Proposal 11: If validity timer is maintained for neighbour cells and separate from serving cell, RAN2 to discuss whether upon any neighbour cell’s validity timer expiry, UE shall re-acquire SIB19 as defined in clause 5.2.2.3.2.

* Continue offline

Proposal 12: (9/13) If validity timer is maintained for neighbour cells and separate from serving cell, UE should attempt to re-acquire SIB19 before the end of neighbour cell’s validity timer(s) by UE implementation.

* Continue offline

Proposal 13: (9/12) If ntn-UlSyncValidityDuration is absent in ntn-Config provided via NTN-NeighCellConfig, the UE uses validity duration configured for the serving cell.

* LGE thinks that p9 should be discussed before agreeing p13 and p14
* Continue offline

Proposal 14: (11/15) In SIB 19, if neighbour cell’s epoch time (i.e., SFN and subframe number) is present in ntn-Config provided via NTN-NeighCellConfig, the UE follows the timing of serving cell for neighbour cell measurement in IDLE/Inactive, i.e., they refer to the SFN and subframe of the serving cell.

* Continue offline

Agreements:

1. It is left to UE implementation on how UEs in RRC\_IDLE/RRC\_INACTIVE re-acquire SIB19 for serving cell’s satellite assistance information
2. RAN2 will wait for RAN1 to conclude regarding when ephemeris/common TA is considered as valid
3. RAN2 will wait for RAN1 to conclude the discussion on epochTime being a future time after the end of current ntn-UlSyncValidityDuration.
4. RAN2 confirms the understanding that “the reference point for epoch time of the serving satellite ephemeris and Common TA parameters is the uplink time synchronization reference point”.

TA report

[R2-2207769](file:///C:\Data\3GPP\Extracts\38331_CR3311_(Rel-17)_R2-2207769%20Corrections%20to%20TA%20Report%20in%20RRC%20Connection%20Reestablishment.docx) Corrections to TA Report in RRC Connection Reestablishment Google Inc. CR Rel-17 38.331 17.1.0 3311 - F NR\_NTN\_solutions-Core

* Continue in offline 103

[R2-2207777](file:///C:\Data\3GPP\Extracts\38331_CR3313_(Rel-17)_R2-2207777%20Corrections%20to%20TA%20Report%20in%20RRC%20Connection%20Resume.docx) Corrections to TA Report in RRC Connection Resume Google Inc. CR Rel-17 38.331 17.1.0 3313 - F NR\_NTN\_solutions-Core

* Continue in offline 103

[R2-2208577](file:///C:\Data\3GPP\Extracts\R2-2208577%2038.331%20cr%20correction%20on%20triggering%20TA%20report%20during%20HO.docx) correction on triggering TA report during HO Xiaomi CR Rel-17 38.331 17.1.0 3445 - F NR\_NTN\_solutions-Core

* Continue in offline 103

harq-ProcessNumberSizeDCI-0-2

[R2-2208364](file:///C:\Data\3GPP\Extracts\R2-2208364%20Discussion%20on%20configuration%20of%20harq-ProcessNumberSizeDCI-0-2.docx) Discussion on configuration of harq-ProcessNumberSizeDCI-0-2 ASUSTeK discussion Rel-16 38.331 NR\_NTN\_solutions-Core

* Continue in offline 103

[R2-2208766](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208766.zip) [Offline-103] Other RRC corrections – second round OPPO discussion Rel-17 NR\_NTN\_solutions-Core

For agreement:

Proposal 1: (15/19) during HO/CHO execution upon applying target cell configuration, UE should:

1) Stop the current T430 (if it is running);

2) Start T430 with the duration ntn-UlSyncValidityDuration from the subframe indicated by epochTime of the target cell.

- Ericsson cannot agree to p1 part 2) as the exact period of when ephemeris and commonTA are valid have not been agreed yet in RAN1. It can be easily reworded though:

2) Start T430 for the target cell as indicated by ntn-UlSyncValidityDuration and epochTime of the target cell.

* Continue offline

Proposal 6: (12/15) If validity timer is maintained for neighbour cells and separate from serving cell, UE should attempt to re-acquire SIB19 before the end of neighbour cell’s validity timer(s) by UE implementation. FFS whether it is already covered by the existing NOTE.

* Apple thinks that p6,7,8 are just valid if we agree the proposal 2 and proposal 4 which are for discussion. So p6,7,8 should be moved to the part for discussion.
* Continue offline

Proposal 7: (16/18) If ntn-UlSyncValidityDuration is absent in ntn-Config provided via NTN-NeighCellConfig, the UE uses validity duration configured for the serving cell. TP related to SIB19 and NTN-Config in R2-2207631 can be used as baseline.

* Continue offline

Proposal 8: (17/17) In SIB 19, if neighbour cell’s epoch time (i.e., SFN and subframe number) is present in ntn-Config provided via NTN-NeighCellConfig, the UE follows the timing of serving cell for neighbour cell measurement in Idle/Inactive mode, i.e., they refer to the SFN and subframe of the serving cell. Change 1 in R2-2207066 can be used as baseline.

* Continue offline

Proposal 9: (16/17) Option 1 in R2-2207769 is used as baseline for TA reporting during RRC re-establishment.

* Agreed

Proposal 10: (17/17) CR in R2-2207777 is not pursued.

* Agreed

Proposal 11: (17/17) The issue raised by R2-2208577 is confirmed. CR in R2-2208577 can be used as baseline.

* Xiaomi thinks the CR implementation in R2-2208577 has the issue that TA report indication to MAC is performed after RACH procedure. Prefer to consider the new updated CR(in R2-2208970)) to fix this issue by placing the indication of TA report immediately before the submission of RRCReconfigurationComplete to lower layers
* Continue offline

For discussion:

Proposal 2: (12/19) UE in RRC\_CONNECTED mode does not maintain validity timer for neighbour cells.

* Continue offline/online

Proposal 3: (12/19) UE in RRC\_IDLE/RRC\_INACTIVE mode does not maintain validity timer for neighbour cells and it is up to UE implementation on how UE in RRC\_IDLE/RRC\_INACTIVE re-acquires SIB19 for neighbour cells.

* Continue offline/online

Proposal 4: (9:8:2) RAN2 to further discuss the valid timer’s details once RAN2 agrees that UE should maintain valid timer for neighbour cells.

* Continue offline/online

Proposal 5: (11/16) If validity timer is maintained for neighbour cells and separate from serving cell, RAN2 to specify that upon any neighbour cell’s validity timer expiry, UE shall re-acquire SIB19 as defined in clause 5.2.2.3.2.

* Continue offline/online

Proposal 12: (12/17) RAN2 to discuss whether to change the value of harq-ProcessNumberSizeDCI-0-2-v1700 from INTEGER (5) to INTEGER (0,1,2,3,4,5).

* Continue offline/online

Agreements via email – from offline 103;

1. Option 1 in R2-2207769 is used as baseline for TA reporting during RRC re-establishment.
2. CR in R2-2207777 is not pursued.

[R2-2208782](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208782.zip) [Offline-103] Other RRC corrections – third round OPPO discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1: (8/10) In SIB 19, if neighbour cell’s epoch time (i.e., SFN and subframe number) is present in ntn-Config provided via NTN-NeighCellConfig, the UE follows the timing of serving cell for neighbour cell measurement in Idle/Inactive mode, i.e., they refer to the SFN and subframe of the serving cell. Change 1 in R2-2207066 can be used as baseline.

Proposal 2: (10/11) During HO/CHO execution upon applying target cell configuration, UE should:

1) Stop the current T430 (if it is running);

2) Start T430 for the target cell as indicated by ntn-UlSyncValidityDuration and epochTime of the target cell

Proposal 3: (9/11) RAN2 do not need to capture T430 for neighbour cells in all RRC states, and it is up to UE implementation on how to re-acquire SIB19 for neighbour cells. FFS whether it can be covered by the existing NOTE.

NOTE: UE should attempt to re-acquire SIB19 before the end of the duration indicated by ntn-UlSyncValidityDuration and epochTime by UE implementation.

Proposal 4: (8/8) If proposal 3 is agreed, UE needs to know information about neighbour cell’s epoch time and ntn-UlSyncValidityDuration to be applied to aid UE’s implementation.

Proposal 5: (9/10) If ntn-UlSyncValidityDuration is absent in ntn-Config provided via NTN-NeighCellConfig, the UE uses validity duration configured for the serving cell. TP related to SIB19 and NTN-Config in R2-2207631 can be used as baseline.

Proposal 6: (8/8) The issue raised by R2-2208577 is confirmed. CR in R2-2208970 can be used as baseline.

UE location

[R2-2207141](file:///C:\Data\3GPP\Extracts\R2-2207141_corrections%20of%20UE%20location%20aspects_v02.doc) Correction of UE location aspects in NTN Thales, Xiaomi discussion Rel-17 38.300 NR\_NTN\_solutions

* Continue in offline 109

[R2-2207144](file:///C:\Data\3GPP\Extracts\R2-2207144_NR-NTN%20Stg2%20CR_v02.docx) Correction of UE location aspects in NTN Thales, Xiaomi draftCR Rel-17 38.300 17.1.0 NR\_NTN\_solutions

* Continue in offline 109

[R2-2207597](file:///C:\Data\3GPP\Extracts\R2-2207597%20Discussion%20on%20the%20UE%20location%20reporting.doc) Discussion on the UE location reporting Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

* Continue in offline 109

[R2-2208575](file:///C:\Data\3GPP\Extracts\R2-2208575%2038.331%20cr%20correction%20on%20coarselocationrequest.docx) correction on coarselocationrequest Xiaomi, Thales CR Rel-17 38.331 17.1.0 3444 - F NR\_NTN\_solutions-Core

* Continue in offline 111 (taking into account the outcome of the IoT-NTN discussion)

[R2-2208288](file:///C:\Data\3GPP\Extracts\R2-2208288%20CR%2038331-3399%20Rel-17%20NR%20NTN%20coarse%20location.docx) Correction to coarseLocationInfo field description for NR NTN Eutelsat S.A. CR Rel-17 38.331 17.1.0 3399 - F NR\_NTN\_solutions-Core

* Continue in offline 111

Neighbour cell list

[R2-2207343](file:///C:\Data\3GPP\Extracts\38331_CR3250_(Rel-17)_R2-2207343%20List%20of%20NTN%20freq.docx) List of frequencies and satellite index for a neighbor satellite in SIB19 Qualcomm Incorporated CR Rel-17 38.331 17.1.0 3250 - F NR\_NTN\_solutions-Core

* Continue in offline 111

[R2-2207148](file:///C:\Data\3GPP\Extracts\R2-2207148%20Remaining%20issues%20on%20ephemeris%20provision.doc) Remaining issues on ephemeris provision Huawei, HiSilicon, Thales discussion Rel-17 NR\_NTN\_solutions-Core

* Continue in offline 111

Necessity of SIB19

[R2-2207439](file:///C:\Data\3GPP\Extracts\R2-2207439_38.331CR3263_(Rel-17)_Clarification%20on%20the%20necessity%20of%20SIB19%20in%20NTN%20cell_v0.docx) Clarification on the necessity of SIB19 in NTN cell Apple CR Rel-17 38.331 17.1.0 3263 - F NR\_NTN\_solutions-Core

* Continue in offline 111

[R2-2208578](file:///C:\Data\3GPP\Extracts\R2-2208578%20Correction%20on%20missing%20the%20action%20upon%20not%20being%20able%20to%20acquire%20SIB19.docx) Correction on missing the action upon not being able to acquire SIB19 Xiaomi CR Rel-17 38.331 17.1.0 3446 - F NR\_NTN\_solutions-Core

* Continue in offline 111

Access restriction

[R2-2207630](file:///C:\Data\3GPP\Extracts\R2-2207630%20Correction%20on%20access%20restriction%20for%20NR%20NTN%20in%20TS%2038.331.docx) Correction on access restriction for NR NTN in TS 38.331 vivo CR Rel-17 38.331 17.1.0 3299 - F NR\_NTN\_solutions-Core

* Continue in offline 111

Misc RRC corrections

[R2-2207324](file:///C:\Data\3GPP\RAN2\Docs\R2-2207324.zip) Rel-17 NTN corrections to NR RRC Nokia, Nokia Shanghai Bell CR Rel-17 38.331 17.1.0 3247 - F NR\_NTN\_solutions-Core Late

* Validity timer aspects handled in offline 103
* For the rest continue in offline 111

[R2-2208381](file:///C:\Data\3GPP\Extracts\R2-2208381%20Miscellaneous%20corrections%20on%2038.331.docx) Miscellaneous corrections on 38.331 CATT discussion Rel-17 NR\_NTN\_solutions-Core

* Continue in offline 111

[R2-2208538](file:///C:\Data\3GPP\Extracts\38.331_CR3434_Rel-17_R2-2208538_Miscellaneous%20corrections%20for%20NTN.docx) Miscellaneous corrections for NTN LG Electronics CR Rel-17 38.331 17.1.0 3434 - F NR\_NTN\_solutions-Core

* Continue in offline 111

Other enhancements

[R2-2207342](file:///C:\Data\3GPP\Extracts\38331_CR3249_(Rel-17)_R2-2207342%20Same%20ULTSRP.docx) Same ULTSRP indication of the target cell during handover Qualcomm Incorporated CR Rel-17 38.331 17.1.0 3249 - F NR\_NTN\_solutions-Core

* Continue in offline 111

[R2-2207889](file:///C:\Data\3GPP\Extracts\R2-2207889.docx) Discussion on whether the inactive state of RRC enables in specific scenarios for NTN BUPT discussion Rel-17

* Noted (no TP)
* [AT119-e][111][NR-NTN] RRC corrections (Ericsson)

Initial scope: Discuss remaining RRC corrections

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): Tuesday 2022-08-23 0400 UTC

Initial deadline (for rapporteur's summary in [R2-2208767](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208767.zip)): Tuesday 2022-08-23 0800 UTC

Proposals marked "for agreement" in [R2-2208767](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208767.zip) not challenged until Tuesday 2022-08-23 20:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Updated scope: Discuss remaining RRC corrections

Updated 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)

Updated deadline (for companies' feedback): Wednesday 2022-08-24 1600 UTC

Updated deadline (for rapporteur's summary in [R2-2208777](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208777.zip)): Wednesday 2022-08-24 1800 UTC

[R2-2208767](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208767.zip) [Offline-111] RRC corrections Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

For email agreement:

Q1: Revert the following change in Rapp CR:

dedicatedSystemInformationDelivery

This field is used to transfer SIB6, SIB7, SIB8, SIB19 to the UE with an active BWP with no common search space configured or the L2 U2N Remote UE in RRC\_CONNECTED. For UEs in RRC\_CONNECTED (including L2 U2N Remote UE), this field is used to transfer the SIBs requested on-demand, except for SIB19.

Proposal is not to consider further change 1 from R2-2207324.

* Agreed

Q2: Not to pursue with R2-2208575

* Agreed

Q3: Agree R2-2208288

* Agreed

Q5: postpone discussion on the second change in R2-2207439

* Agreed

Q8 Q9: postpone discussion on Change 2 and 8 in CR R2-2207324

* Agreed

Q10: Agree proposal 1 in CR R2-2208381

* Agreed

Q11: Agree Change 2 b) and c) from CR R2-2208538 in Rapp CR

* Agreed

Q12: Not to pursue with Change 3 from CR R2-2208538 in Rapp CR

* Agreed

Q15: Not to pursue with enhancements to the propagation delay report in Rel17

* Agreed

Q16: Not to pursue with CR R2-2207342

* Agreed

Second round/Discuss online

Q4: Discuss further if specification change is needed to capture that UE must read SIB19 before accessing an NTN cell without linking this to that “cell is barred”.

* Continue offline

Q6: Suggestion to agree only change to 5.2.2.4.1 and change the note to:

NOTE X: A UE capable of NTN access shall acquire SIB1 to determine whether the cell is an NTN cell.

* Continue offline

Q7: Discuss change to D1 entering condition according to R2-2208534

* Continue offline

Q13: If time allows to discuss light changes to neighbor cell SI broadcasting

* Continue offline

[R2-2208777](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208777.zip) [Offline-111] RRC corrections – second round Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1 Not to pursue changes to default bearer values

Proposal 2 Postpone discussion on “field description restriction for the validity timer is converted to ASN1 condition”

Proposal 3 Not to pursue CR R2-2208578

Proposal 4 agree to adopt first change from CR R2-2207630 and “NOTE X: A UE capable of NTN access shall acquire SIB1 to determine whether the cell is an NTN cell.” in Rapp CR

Proposal 5 Adopt the changes related to entering condition from CR R2-2208534

Proposal 6 RAN2 to agree to clarify that the UE can use the assistance information of neighbour cells in the SIB19 for measurement and mobility purposes in RRC\_CONNECTED. Discuss online whether this could be captured in stage 2.

* QC supports P2 in Q6, as there is a serious limitation, problematic for UEs in IDLE mode measurement. In SIB3/4, there are a bunch of frequencies listed, bunch of cells list as neighbors. However, in SIB19, there is just one frequency and cell listed for a neighbor satellite. This is the mistake we made, we think. Then what to do other frequencies that are listed in SIB3/4, not measure them? What is the point of Proposal 7 adding multiple SMTCs in SIB4 while UE does not know satellite information associated with frequency in SIB4? QC thinks either the association between SIB3/4 and SIB19 is needed or the SIB19 should include more than one frequencies or cells or it should be clarified the UE is required to measure only the frequency/cell listed in SIB19.

Proposal 7 Capture the following:

SIB2:

smtc

Measurement timing configuration for intra-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms for the intra-frequnecy cells. If the field is broadcast by an NTN cell, the Offset (derived from parameter periodicityAndOffset) is based on the assumption that service link propagation delay difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual Offset based on the actual propagation delay difference.

SIB4 (adding the same sentence with SIB2):

smtc

Measurement timing configuration for inter-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms in this frequency. If the field is broadcast by an NTN cell, the Offset (derived from parameter periodicityAndOffset) is based on the assumption that service link propagation delay difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual Offset based on the actual propagation delay difference.

Misc 38.306 corrections

[R2-2208537](file:///C:\Data\3GPP\Extracts\38.306_CR0794_Rel-17_R2-2208537_CorrectionNTNCapabilities.docx) Corrections to NTN capabilities LG Electronics CR Rel-17 38.306 17.1.0 0794 - F NR\_NTN\_solutions-Core, NR\_redcap-Core

* Continue in offline 102 (then the outcome will be covered in the UE capabilities CRs)

[R2-2208679](file:///C:\Data\3GPP\Extracts\R2-2208679%20-%20R17%20NR%20NTN%20UE%20Capability%20issues.docx) R17 NR NTN UE Capability issues Ericsson discussion Rel-17

* Continue in offline 102 (then the outcome will be covered in the UE capabilities CRs)

Misc Stage 2 corrections

[R2-2207442](file:///C:\Data\3GPP\Extracts\R2-2207442_Clarification%20on%20the%20features%20supported%20in%20NTN%20network_v0.doc) Clarification on the features supported in NTN network Apple discussion Rel-17 NR\_NTN\_solutions-Core

* Continue in offline 109

[R2-2208380](file:///C:\Data\3GPP\Extracts\38.300_CR0538(Rel-17)_R2-2208380%20%7fMiscellaneous%20corrections%20on%2038.300.docx) Miscellaneous corrections on 38.300 CATT CR Rel-17 38.300 17.1.0 0538 - F NR\_NTN\_solutions-Core

* Continue in offline 109

## 6.12 Reduced Capability

(NR\_redcap-Core; leading WG: RAN1; REL-17; WID: [RP-211574](file:///C:\Data\3GPP\archive\RAN\RAN%2392\Tdocs\RP-211574.zip))

Tdoc Limitation: 4 tdocs

### 6.12.1 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.

#### 6.12.1.1 LS in

For LSes that need action: one tdoc by contact company to address the LS and potential reply is considered.

Rapporteur input may be provided.

Offset to transmit CD-SSB and NCD-SSB at different times

[R2-2206924](file:///C:\Data\3GPP\Extracts\R2-2206924_R1-2205535.docx) Reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times (R1-2205535; contact: Ericsson) RAN1 LS in Rel-17 NR\_redcap-Core To:RAN2 Cc:RAN4

* Noted (already considered at RAN2#118-e)

[R2-2206944](file:///C:\Data\3GPP\Extracts\R2-2206944_R4-2210599.docx) Reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times (R4-2210599; contact: Ericsson) RAN4 LS in Rel-17 NR\_redcap-Core To:RAN2 Cc:RAN1

* Noted (already considered at RAN2#118-e)

CGI reading

[R2-2206941](file:///C:\Data\3GPP\Extracts\R2-2206941_R4-2210593.docx) LS on CGI reading with autonomous gaps for RedCap (R4-2210593; contact: Ericsson) RAN4 LS in Rel-17 NR\_redcap-Core To:RAN2

* Noted (already taken into account in RAN2 specs)

Measurement capability

[R2-2206942](file:///C:\Data\3GPP\Extracts\R2-2206942_R4-2210594.docx) LS on measurement capability for RedCap (R4-2210594; contact: CMCC) RAN4 LS in Rel-17 NR\_redcap-Core To:RAN2 Cc:RAN1

* Noted

RRM relaxation

[R2-2206943](file:///C:\Data\3GPP\Extracts\R2-2206943_R4-2210598.docx) Reply LS on RRM relaxation for Redcap (R4-2210598; contact: vivo) RAN4 LS in Rel-17 NR\_redcap-Core To:RAN2

* Noted

#### 6.12.1.2 Rapporteur inputs

CR Rapporteurs may provide baseline correction CRs containing smaller corrections, text clarifications, etc - please contact the CR rapporteurs before providing contributions on those aspects.

Stage 2

[R2-2208219](file:///C:\Data\3GPP\Extracts\R2-2208219%20-%20RedCap%20corrections%20in%20TS%2038300.docx) Corrections on RedCap in TS 38.300 Nokia, Nokia Shanghai Bell, Huawei CR Rel-17 38.300 17.1.0 0535 - F NR\_redcap-Core

* Revised in [R2-22](javascript:void(0);)08770
* Continue in offline 113

R2-2208770 Corrections on RedCap in TS 38.300 Nokia, Nokia Shanghai Bell, Huawei CR Rel-17 38.300 17.1.0 0535 1 F NR\_redcap-Core

* [AT119-e][113][RedCap] Stage-2 CR (Nokia)

Scope: Draft Stage-2 CR, also considering Stage-2 text proposals in contributions to other AIs

Intended outcome: Agreeable Stage-2 CR

Deadline (for companies' feedback): Wednesday 2022-08-24 1000 UTC

Deadline (for rapporteur's summary in R2-2208769 and for Stage-2 CR in R2-2208770): Wednesday 2022-08-24 1800 UTC

[R2-22](javascript:void(0);)08769 [offline-113] Stage-2 CR Nokia discussion Rel-17 NR\_NTN\_solutions-Core

MAC CR

[R2-2207746](file:///C:\Data\3GPP\Extracts\38.321_CR1336_(Rel-17)_R2-2207746_Miscellaneous%20CR%20on%20TS%2038.321%20for%20RedCap.docx) Miscellaneous CR on TS 38.321 for RedCap vivo CR Rel-17 38.321 17.1.0 1336 - F NR\_redcap-Core

* Continue in offline 114

RRC CR

[R2-2208306](file:///C:\Data\3GPP\Extracts\R2-2208306%20-%20Miscellaneous%20corrections%20for%20RedCap%20WI%20-%20TS%2038.331.docx) Miscellaneous corrections for RedCap WI Ericsson CR Rel-17 38.331 17.1.0 3400 - F NR\_redcap-Core

* Continue in offline 115

38.304 CR

[R2-2208307](file:///C:\Data\3GPP\Extracts\R2-2208307%20-%20Miscellaneous%20corrections%20for%20RedCap%20WI%20-%20TS%2038.304.docx) Miscellaneous corrections for RedCap WI Ericsson CR Rel-17 38.304 17.1.0 0276 - F NR\_redcap-Core

* Revised in [R2-22](javascript:void(0);)08773
* Continue in offline 116

R2-2208773 Miscellaneous corrections for RedCap WI Ericsson CR Rel-17 38.304 17.1.0 0276 1 F NR\_redcap-Core

* [AT119-e][116][RedCap] Idle mode CR (Ericsson)

Scope: Draft 38.304 CR, taking into account the relevant agreement from offline 115

Intended outcome: Agreeable 38.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for 38.304 CR in R2-2208773): Friday 2022-08-25 1000 UTC

### 6.12.2 Control Plane

#### 6.12.2.1 NCD-SSB aspects

Corrections/clarifications on NCD-SSB aspects

SSB time offset

[R2-2207464](file:///C:\Data\3GPP\Extracts\R2-2207464-CR-331-redcap-tdd-offset.docx) CR on handling time domain offset of CD and NCD-SSB Apple CR Rel-17 38.331 17.1.0 3267 - F NR\_redcap-Core

* Apple indicates that this reflect the RAN1 LS.
* QC shares a similar view that current values are not sufficient and have a slightly different proposal in their CR
* Ericsson wonders whether we need to include all the possible values. Mediatek agrees and thinks we could wait for LSs from other groups
* HW thinks that RAN4 is discussing new values
* Vivo thinks there is no new LS from RAN1/RAN4 yet so we can wait for this to fix the actual values.
* Intel agrees with Ericsson, Mediatek and vivo. Regarding the actual proposal they prefer the Apple approach. ZTE agrees but prefers the QC approach
* RAN2 will wait for feedback from RAN1/RAN4

[R2-2207465](file:///C:\Data\3GPP\Extracts\R2-2207465-CR-306-redcap-tdd-offset.docx) CR on handling time domain offset of CD and NCD-SSB Apple CR Rel-17 38.306 17.1.0 0768 - F NR\_redcap-Core

[R2-2208136](file:///C:\Data\3GPP\Extracts\R2-2208136%20Correction%20to%20definition%20and%20values%20of%20ssb-TimeOffset%20for%20NCD-SSB.doc) Correction to definition and values of ssb-TimeOffset for NCD-SSB Qualcomm Incorporated CR Rel-17 38.331 17.1.0 3360 - F NR\_redcap-Core

[R2-2207619](file:///C:\Data\3GPP\Extracts\R2-2207619%20Remaining%20issues%20on%20NCD-SSB%20for%20RedCap.docx) Remaining issues on NCD-SSB for RedCap Huawei, HiSilicon discussion Rel-17 NR\_redcap-Core

Agreements:

1. RAN2 will wait for feedback from RAN1/RAN4 before introducing additional values for the time domain offset of CD and NCD-SSB

Measurement related issues

[R2-2207041](file:///C:\Data\3GPP\Extracts\R2-2207041%20Clarification%20on%20reference%20SSB%20for%20intra-frequency%20and%20inter-frequency%20measurements.docx) Clarification on reference SSB for intra- and inter-frequency measurements for RedCap UEs Qualcomm Incorporated CR Rel-17 38.300 17.1.0 0508 - F NR\_redcap-Core

* QC thinks this captures the agreement from the previous meeting.
* Mediatek agrees and wonders if we need is as a note or as normative text. VDF thinks this should not be a note.
* IDC/Intel/ZTE support the QC proposal
* Huawei thinks we don’t need to capture this in RAN2 specs but refer to RAN4
* Ericsson agrees with the intention
* RAN2 agrees with the principle. Actual wording of the change to be discussed in offline 113

[R2-2208383](file:///C:\Data\3GPP\Extracts\R2-2208383%20Correction%20on%20description%20of%20SSB%20based%20intra-frequency%20measurement%20for%20RedCap%20UE.docx) Correction on description of SSB based intra-frequency measurement for RedCap UE CATT CR Rel-17 38.300 17.1.0 0539 - F NR\_redcap-Core

* QC agrees with the reason but the wording can be improved. Huawei/Mediatek/ZTE agree
* RAN2 agrees with the principle. Actual wording of the change to be discussed in offline 113

Corrections on initial BWP and rach-ConfigCommon

[R2-2208308](file:///C:\Data\3GPP\Extracts\R2-2208308%20-%20Clarification%20on%20the%20field%20description%20of%20rach-ConfigCommon%20for%20RedCap%20UEs.docx) Clarification on the field description of rach-ConfigCommonfor for RedCap UEs Ericsson CR Rel-17 38.331 17.1.0 3401 - F NR\_redcap-Core

* Continue in offline 117

[R2-2207748](file:///C:\Data\3GPP\Extracts\38.331_CR3307(Rel-17)_%20R2-2207748_Correction%20on%20RRC%20for%20RedCap.docx) Correction on RRC for RedCap vivo, Guangdong Genius CR Rel-17 38.331 17.1.0 3307 - F NR\_redcap-Core

* Continue in offline 117

Other

Moved here from 6.12.2.2

[R2-2207747](file:///C:\Data\3GPP\Extracts\R2-2207747_Discussion%20on%20NCD-SSB%20for%20RedCap.docx) Discussion on NCD SSB for RedCap UEs vivo, Guangdong Genius discussion Rel-17 NR\_redcap-Core

* Continue in offline 117

[R2-2207995](file:///C:\Data\3GPP\Extracts\R2-2207995%20Clarification%20of%20BWP%20operation%20in%20Connected%20mode.docx) Clarification of BWP operation in Connected mode MediaTek Inc. discussion Rel-17 NR\_redcap-Core

* Continue in offline 117

[R2-2208311](file:///C:\Data\3GPP\RAN2\Docs\R2-2208311.zip) Introducing capability bit for RedCap UEs to indicate NCD-SSB support Ericsson discussion Rel-17 NR\_redcap-Core Late

* Continue in offline 117

[R2-2208398](file:///C:\Data\3GPP\Extracts\R2-2208398%20CR%20for%20RACH%20operation%20during%20SI%20update%20when%20the%20active%20BWP%20contains%20no%20CD-SSB_v1.docx) CR for RACH operation during SI update when the active BWP contains no CD-SSB LG Electronics Inc. CR Rel-17 38.331 17.1.0 3414 - F NR\_redcap-Core

* Continue in offline 117
* [AT119-e][117][RedCap] NCD-SSB corrections (ZTE)

Initial scope: Discuss remaining NCD-SSB corrections

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): Monday 2022-08-22 1200 UTC

Initial deadline (for rapporteur's summary in [R2-2208774](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208774.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208774](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208774.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Discuss TP related to agreed p1 and continue the discussion on p6 and p8

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): Thursday 2022-08-25 1200 UTC

Final deadline (for rapporteur's summary in R2-2208786): Thursday 2022-08-25 1400 UTC

Proposals marked "for agreement" in R2-2208786 not challenged until Friday 2022-08-26 02:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue online).

[R2-2208774](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208774.zip) [Offline-117] NCD-SSB corrections ZTE Corporation discussion Rel-17 NR\_redcap-Core

For easy agreements:

Proposal 1 CR in R2-2208308 is considered as a baseline, detailed wording to be discussed in phase 2 (i.e. taking into account the comments in phase1).

* Agreed

Proposal 2 Agree to use “RedCap-specific initial downlink/uplink BWP” terminology in spec. The changes in clause 5.2.2.4.2 in R2-2207748 are merged into 38.331 rapporteur CR, other places (e.g. in clause 5.3.3.3 and 5.3.13.3) can also be updated.

* Agreed

Proposal 3 For neighbour cell measurements, RAN2 understands the existing RRM mechanism is applied, further enhancement is not needed.

* Agreed

Proposal 5 (13/16) The BWP ID for RedCap-specific initial UL/DL BWP is BWP ID#0 (spec change can be discussed in offline-115 based on R2-2208385).

* Agreed

Proposal 10 The CR in R2-2208398 is not pursued.

* Agreed

Proposal 11 (8/11) For dedicated BWP (non-initial BWP) of a RedCap UE in the connected mode, pagingSearchSpace, searchSpaceOtherSystemInformation and searchSpaceSIB1 can be configured in PDCCH-ConfigCommon, if the dedicated BWP does not include CD-SSB and the entire CORESET#0 (no spec impact foreseen).

* Agreed

Proposal 12 (9/10) RAN2 observes that, for event A3/A5 when determining applicable cells, PCell PCI associated with other measObjectNR can be considered as a neighbour cell (no spec impact foreseen).

* Agreed

For online discussion:

Proposal 4 RAN2 will not further discuss extending NCD-SSB to non-RedCap UEs in Rel-17 unless requested by RANP.

* Continue online

Proposal 6 (13/16) If a RedCap-specific initial UL/DL BWP is configured, for RRC-based, DCI-based (if possible) or timer-based BWP switching, the BWP ID#0 always maps to the RedCap-specific initial UL/DL BWP.

* Continue offline

Proposal 7 (14/15) RAN2 confirms the following understanding, if no consensus, then send LS to RAN4 for clarification.

- The configured UE channel bandwidth for RedCap UEs cannot exceed the RedCap UE’s maximum bandwidth (20MHz for FR1 and 100MHz for FR2).

* Continue online

Proposal 8 (12/15) RAN2 confirms the below RAN2 agreement is also applicable to RedCap UEs:

- (RAN2-115e agreement): The network avoids DCI- and timer-based BWP switching to BWPs that are not within current channel BWP.

* Continue offline

Proposal 9 (5/6/4) To discuss (from RAN2 perspective) the necessity of introducing IODT bit to indicate the support of NCD-SSB.

* Continue online

Agreements via email – from offline 117;

1. CR in R2-2208308 is considered as a baseline, detailed wording to be discussed in phase 2 (i.e. taking into account the comments in phase1).
2. Agree to use “RedCap-specific initial downlink/uplink BWP” terminology in spec. The changes in clause 5.2.2.4.2 in R2-2207748 are merged into 38.331 rapporteur CR, other places (e.g. in clause 5.3.3.3 and 5.3.13.3) can also be updated.
3. For neighbour cell measurements, RAN2 understands the existing RRM mechanism is applied, further enhancement is not needed.
4. The BWP ID for RedCap-specific initial UL/DL BWP is BWP ID#0 (spec change can be discussed in offline-115 based on R2-2208385).
5. The CR in R2-2208398 is not pursued.
6. For dedicated BWP (non-initial BWP) of a RedCap UE in the connected mode, pagingSearchSpace, searchSpaceOtherSystemInformation and searchSpaceSIB1 can be configured in PDCCH-ConfigCommon, if the dedicated BWP does not include CD-SSB and the entire CORESET#0 (no spec impact foreseen).
7. RAN2 observes that, for event A3/A5 when determining applicable cells, PCell PCI associated with other measObjectNR can be considered as a neighbour cell (no spec impact foreseen).

R2-2208786 [Offline-117] NCD-SSB corrections – second round ZTE Corporation discussion Rel-17 NR\_redcap-Core

Other Stage 2

[R2-2208111](file:///C:\Data\3GPP\Extracts\R2-2208111%20Correction%20on%20RedCap-specific%20initial%20BWP.docx) Correction on RedCap-specific initial BWP ZTE Corporation, Sanechips CR Rel-17 38.300 17.1.0 0529 - F NR\_redcap-Core

* Continue in offline 113

#### 6.12.2.2 Other RRC corrections

Contributions on any other RRC issues.

SI request on SUL

[R2-2208386](file:///C:\Data\3GPP\Extracts\R2-2208386%20Discussion%20and%20TP%20on%20the%20SI%20request%20on%20SUL%20for%20RedCap.docx) Discussion and TP on the SI request on SUL for RedCap CATT discussion Rel-17 NR\_redcap-Core

Proposal 1: RAN2 discuss the behavior of RedCap UE for SI request in the following scenario:

* SUL is configured, the bandwidth of which is not larger than the maximum bandwidth of RedCap, and
* RedCap-specific initial UL BWP is configured

And two optional solutions are:

Option 1: clarify that the configured supplementary uplink can also be used by RedCap UE for SI request or positioning SI request, even the RedCap-specific initial UL BWP is configured.

Option 2: update the corresponding the procedure to preclude Redcap UE using configured supplementary uplink, if RedCap-specific initial UL BWP is configured.

- HW thinks we should go for option 1 and have some strong concerns with option 2

- QC thinks nothing needs to be done but are also ok to go for option 1.

- Mediatek, Ericsson, vivo, Intel think we don’t need to do anything in the specification. Huawei also thinks we don’t need any CR

* RAN2 confirms that the selected supplementary uplink can also be used by RedCap UE for SI request or positioning SI request

Agreements:

1. RAN2 confirms that the selected supplementary uplink can also be used by RedCap UE for SI request or positioning SI request

Inter-RAT mobility

[R2-2207230](file:///C:\Data\3GPP\Extracts\R2-2207230%20-%20Correction%20on%20inter-RAT%20handover%20from%20E-UTRA%20to%20NR%20for%20RedCap.docx) Correction on inter-RAT handover from E-UTRA to NR for RedCap Sequans Communications, Huawei, HiSilicon CR Rel-17 38.300 17.1.0 0505 - F NR\_redcap-Core

- VDF is not sure this would solve the ping-pong problem

- QC is not fine to have the second sentence, it should be left to UE implementation. Ericsson, Oppo, Intel, Xiaomi, Nokia, vivo agree.

- Sequans thinks the second sentence is already an agreement (with a “should” instead of “expected to”). It prevents the UE from accessing a non-supporting cell, not to avoid the HO.

* RAN2 agrees to have a note in Stage 2, based on the TP in R2-2207230. Further discuss the detailed wording in offline 113, especially for the second sentence.

Agreements:

1. For inter-RAT mobility from LTE to NR, RAN2 agrees to have a note in Stage 2, based on the TP in R2-2207230. Further discuss the detailed wording offline, especially for the second sentence.

[R2-2207069](file:///C:\Data\3GPP\Extracts\R2-2207069%20RedCap%20HO.doc) Discussion on inter-RAT mobility from LTE to NR OPPO discussion Rel-17 NR\_redcap-Core

[R2-2207996](file:///C:\Data\3GPP\Extracts\R2-2207996%20Inter%20RAT%20handover%20from%20LTE%20to%20NR.docx) Inter-RAT handover from LTE to NR MediaTek Inc. discussion Rel-17 NR\_redcap-Core

eDRX

[R2-2207054](file:///C:\Data\3GPP\Extracts\R2-2207054-%20Clarification%20on%20support%20of%20eDRX.doc) Clarification on support of eDRX OPPO CR Rel-17 38.331 17.1.0 3213 - F NR\_redcap-Core

* Continue in offline 115

[R2-2207055](file:///C:\Data\3GPP\Extracts\R2-2207055-%20Clarification%20on%20UE%20support%20of%20eDRX.doc) Clarification on UE support of eDRX OPPO CR Rel-17 38.306 17.1.0 0757 - F NR\_redcap-Core

* Continue in offline 115

[R2-2208631](file:///C:\Data\3GPP\Extracts\R2-2208631%20Correction%20on%20eDRX%20allowed%20indication%20and%20PDCCH-ConfigCommon.docx) Correction on eDRX allowed indication and PDCCH-ConfigCommon ZTE Corporation, Sanechips CR Rel-17 38.331 17.1.0 3456 - F NR\_redcap-Core

* Continue in offline 115

[R2-2208632](file:///C:\Data\3GPP\Extracts\R2-2208632%20Correction%20on%20eDRX%20allowed%20indication%20and%20BFD.docx) Correction on eDRX allowed indication and BFD ZTE Corporation, Sanechips CR Rel-17 38.300 17.1.0 0544 - F NR\_redcap-Core

* Continue in offline 115

Corrections on PDCCH-ConfigCommon

[R2-2207620](file:///C:\Data\3GPP\Extracts\R2-2207620%20Corrections%20on%20PDCCH-ConfigCommon%20for%20RedCap%20initial%20BWP.docx) Corrections on PDCCH-ConfigCommon for RedCap initial BWP Huawei, HiSilicon CR Rel-17 38.331 17.1.0 3297 - F NR\_redcap-Core

* Continue in offline 115

[R2-2207209](file:///C:\Data\3GPP\Extracts\R2-2207209%2038.331%20Corrections%20on%20PDCCH-ConfigCommon%20for%20Redcap.docx) 38.331 Corrections on PDCCH-ConfigCommon for Redcap Xiaomi Communications draftCR Rel-17 38.331 17.1.0 NR\_redcap-Core

* Continue in offline 115

[R2-2208309](file:///C:\Data\3GPP\Extracts\R2-2208309%20-%20Clarification%20on%20the%20field%20description%20of%20commonControlResourceSet%20for%20RedCap%20UEs.docx) Clarification on the field description of commonControlResourceSet for RedCap UEs Ericsson CR Rel-17 38.331 17.1.0 3402 - F NR\_redcap-Core

* Continue in offline 115

[R2-2208924](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208924.zip) Correction on PUCCH-ConfigCommon for RedCap UE ZTE Corporation, Sanechips CR Rel-17 38.331 17.1.0 3463 - F NR\_redcap-Core Late

* Continue in offline 115

UE capabilities

[R2-2207386](file:///C:\Data\3GPP\Extracts\R2-2207386%20_%202TX%20and%202UL%20MIMO%20for%20RedCap%20UEs.docx) Alignment on the support of 2TX and 2UL MIMO for RedCap UEs Intel Corporation, Huawei discussion Rel-17 NR\_redcap-Core

* Continue in offline 115

Initial DL BWP

[R2-2208385](file:///C:\Data\3GPP\Extracts\R2-2208385%20Corrections%20on%20RedCap%20specific%20initial%20DL%20BWP%20related%20description.docx) Corrections on RedCap specific initial DL BWP related description CATT CR Rel-17 38.331 17.1.0 3413 - F NR\_redcap-Core

* Continue in offline 115

[R2-2208438](file:///C:\Data\3GPP\Extracts\R2-2208438 Remaining aspect on RedCap initial DL BWP.docx) Remaining aspect on RedCap initial DL BWP CMCC discussion Rel-17 NR\_redcap-Core

* Continue in offline 115

[R2-2208439](file:///C:\Data\3GPP\RAN2\Docs\R2-2208439.zip) Corrections on RedCap initial DL BWP CMCC CR Rel-17 38.331 17.1.0 3420 - F NR\_redcap-Core

* Continue in offline 115

Other

[R2-2207621](file:///C:\Data\3GPP\Extracts\R2-2207621%20Corrections%20on%20the%20relaxed%20measurement%20criterion%20and%20smtc%20field%20for%20RedCap.docx) Corrections on the relaxed measurement criterion and smtc field for RedCap Huawei, HiSilicon CR Rel-17 38.331 17.1.0 3298 - F NR\_redcap-Core

* Continue in offline 115

[R2-2208310](file:///C:\Data\3GPP\RAN2\Docs\R2-2208310.zip) Paging configuration for RedCap UEs in the initial DL BWP Ericsson discussion Rel-17 NR\_redcap-Core Late

* Continue in offline 115
* [AT119-e][115][RedCap] CP corrections (Ericsson)

Initial scope: Discuss remaining CP corrections

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): Tuesday 2022-08-23 1200 UTC

Initial deadline (for rapporteur's summary in R2-2208772): Tuesday 2022-08-23 2000 UTC

Proposals marked "for agreement" in R2-2208772 not challenged until Wednesday 2022-08-24 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Updated scope: Discuss remaining CP corrections

Updated 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)

Updated deadline (for companies' feedback): Thursday 2022-08-25 1600 UTC

Updated deadline (for rapporteur's summary in R2-2208790): Thursday 2022-08-25 2000 UTC

R2-2208772 [Offline-115] RRC corrections Ericsson discussion Rel-17 NR\_redcap-Core

List of proposals for agreement

Proposal 1 In R2-2207054 and R2-2207055; proposed changes in the field descriptions are captured in the specifications, but the changes to the existing parameter names are not needed.

- Nokia had a concern on the eDRX allowed indication field descriptions in R2-2207054. It has been agreed that network can control eDRX both in IDLE and INACTIVE, but now the proposal is to remove control for RRC states against earlier agreements. However Nokia is ok with the intention of the CRs to allow eDRX for CN paging in INACTIVE. Nokia suggests something like:

“eDRX-AllowedIdle

The presence of this field indicates that extended DRX for CN paging is allowed in the cell for UEs in RRC\_IDLE or RRC\_INACTIVE. The UE shall stop using extended DRX for CN paging in RRC\_IDLE or RRC\_INACTIVE if eDRX-AllowedIdle is not present.

eDRX-AllowedInactive

The presence of this field indicates that extended DRX for RAN paging is allowed in the cell for UEs in RRC\_INACTIVE. The UE shall stop using extended DRX for RAN paging in RRC\_INACTIVE if eDRX-AllowedInactive is not present.”

* Continue offline

Proposal 2 RAN2 agrees with the changes in R2-2208631 and R2-2208632 in principle, and continue the discussion to agree on the wording.

* Agreed

Proposal 3 RAN2 agrees with the changes in R2-2207209, R2-2207620 R2-2208309 in principle, and continue the discussion to agree on the wording.

- CATT indicates they have another version in their paper R2-2208385, and was not listed during the discussion. CATT suggests to discussing with other three solutions together.

* Agreed as “RAN2 agrees with the changes in R2-2207209, R2-2207620, R2-2208309, R2-2208385 in principle, and continue the discussion to agree on the wording.”

Proposal 4 R2-2208924 is not pursued

* Agreed

Proposal 6 RAN2 agrees with the changes in R2-2207386 in principle, and prefers option 1. FFS whether the wording in Option 1 is revised.

* Agreed

Proposal 8 R2-2208439 is not pursued.

* Agreed

List of proposals for further discussion

Proposal 5 R2-2208932 is agreed. FFS whether an LS to RAN1 is needed.

* Continue offline/online

Proposal 7 Wait for the conclusion of the related discussion in offline#117 and decide whether/what changes are needed based on the outcome.

* Continue offline/online

Proposal 9 In R2-2207621, first change is captured in the specifications, discuss further to agree on whether the second change is needed.

* Continue offline/online

Proposal 10 Continue the discussion on whether the proposed change in R2-2208310 is needed.

* Continue offline/online

Agreements via email – from offline 115;

1. RAN2 agrees with the changes in R2-2208631 and R2-2208632 in principle, and continue the discussion to agree on the wording.
2. RAN2 agrees with the changes in R2-2207209, R2-2207620, R2-2208309, R2-2208385 in principle, and continue the discussion to agree on the wording.
3. R2-2208924 is not pursued
4. RAN2 agrees with the changes in R2-2207386 in principle, and prefers option 1. FFS whether the wording in Option 1 is revised.
5. R2-2208439 is not pursued.

R2-2208790 [Offline-115] RRC corrections – second round Ericsson discussion Rel-17 NR\_redcap-Core

Other Stage 2

[R2-2207751](file:///C:\Data\3GPP\Extracts\38.300_CR0517(Rel-17)_%20R2-2207751_Correction%20on%20TS%2038.300%20for%20RedCap.docx) Correction on TS 38.300 for RedCap vivo CR Rel-17 38.300 17.1.0 0517 - F NR\_redcap-Core

* Continue in offline 113

Withdrawn

[R2-2208155](file:///C:\Data\3GPP\Extracts\R2-2208155%20-%20Correction%20of%20need%20codes%20and%20field%20descriptions%20for%20DMRS%20bundling.docx) Correction on UERadioPagingInformation and UERadioPagingInfo container Ericsson CR Rel-17 38.331 17.1.0 3364 - F NR\_newRAT-Core, NR\_redcap-Core Withdrawn

R2-2207749 Correction on capability for RedCap vivo, Guangdong Genius CR Rel-17 38.306 17.1.0 0777 - F NR\_redcap-Core Late

#### 6.12.2.3 Idle inactive mode corrections

Contributions on 38.304 issues

[R2-2207007](file:///C:\Data\3GPP\Extracts\R2-2207007_DraftCR_38304_Correction%20to%20description%20of%20first-PDCCH-MonitoringOccasionOfPO.docx) Correction to description of first-PDCCH-MonitoringOccasionOfPO Samsung Electronics Co., Ltd draftCR Rel-17 38.304 17.1.0 NR\_redcap-Core

* Continue in offline 115

[R2-2207207](file:///C:\Data\3GPP\Extracts\R2-2207207%2038.304%20Correction%20on%20the%20e-DRX%20for%20Redcap.docx) 38.304 Correction on the e-DRX for Redcap Xiaomi Communications draftCR Rel-17 38.304 17.1.0 NR\_redcap-Core

* Continue in offline 115

[R2-2207622](file:///C:\Data\3GPP\Extracts\R2-2207622%20Corrections%20on%20the%20intra-FreqReselection%20and%20eDRX%20supporting%20for%20RedCap.docx) Corrections on the intra-FreqReselection and eDRX supporting for RedCap Huawei, HiSilicon CR Rel-17 38.304 17.1.0 0265 - F NR\_redcap-Core

* Continue in offline 115

[R2-2207750](file:///C:\Data\3GPP\Extracts\R2-2207750_Discussion%20on%20CellBar%20for%20RedCap.docx) Discussion on cellBar for RedCap vivo, Guangdong Genius discussion Rel-17 NR\_redcap-Core

* Continue in offline 115

[R2-2208112](file:///C:\Data\3GPP\Extracts\R2-2208112%20Miscellaneous%20correction%20on%20eDRX(1).docx) Miscellaneous correction on eDRX ZTE Corporation, Sanechips CR Rel-17 38.304 17.1.0 0271 - F NR\_redcap-Core

* Continue in offline 115

[R2-2208221](file:///C:\Data\3GPP\Extracts\R2-2208221%20-%20Correction%20on%20eDRX%20allowed%20indication%20in%20TS%2038304.docx) Correction on eDRX-Allowed indication Nokia, Nokia Shanghai Bell CR Rel-17 38.304 17.1.0 0274 - F NR\_redcap-Core

* Continue in offline 115

### 6.12.3 User Plane

#### 6.12.3.1 MAC aspects

[R2-2207008](file:///C:\Data\3GPP\Extracts\R2-2207008_DraftCR_38321_BWP%20Switching%20upon%20SI%20request%20ack.docx) BWP Switching upon SI request ack Samsung Electronics Co., Ltd draftCR Rel-17 38.321 17.1.0 NR\_redcap-Core

* Continue in offline 114

[R2-2207009](file:///C:\Data\3GPP\Extracts\R2-2207009_DraftCR_38321_BWP%20Switching%20in%20RRC_IDLE_RRC_INACTIVE_upon%20RA%20initiation.docx) BWP Switching in RRC\_IDLE\_RRC\_INACTIVE\_upon RA initiation Samsung Electronics Co., Ltd draftCR Rel-17 38.321 17.1.0 NR\_redcap-Core

* Continue in offline 114

[R2-2207010](file:///C:\Data\3GPP\Extracts\R2-2207010_DraftCR_38321_Corrections%20to%20BWP%20inactivity%20timer%20(re)start%20criteria%20upon%20reception%20of%20PDCCH%20for%20BWP%20switching.docx) Corrections to BWP inactivity timer (re)start criteria upon reception of PDCCH for BWP switching Samsung Electronics Co., Ltd draftCR Rel-17 38.321 17.1.0 NR\_redcap-Core

* Continue in offline 114

[R2-2207208](file:///C:\Data\3GPP\Extracts\R2-2207208%2038.321%20Correction%20on%20the%20BWP%20operations%20for%20Redcap.docx) 38.321 Correction on the BWP operations for Redcap Xiaomi Communications draftCR Rel-17 38.321 17.1.0 NR\_redcap-Core

* Continue in offline 114

[R2-2207903](file:///C:\Data\3GPP\Extracts\R2-2207903%20RedCap%20support%20for%20sending%20BFR%20MAC%20CE%20for%20SpCell%20BFR.docx) RedCap support for sending BFR MAC CE for SpCell BFR Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_redcap-Core

* Continue in offline 114

[R2-2207904](file:///C:\Data\3GPP\Extracts\R2-2207904%20Correction%20on%20RedCap%20support%20for%20sending%20BFR%20MAC%20CE%20for%20SpCell%20BFR.docx) Correction on RedCap support for sending BFR MAC CE for SpCell BFR Nokia, Nokia Shanghai Bell CR Rel-17 38.306 17.1.0 0782 - F NR\_redcap-Core

* Continue in offline 114

[R2-2208384](file:///C:\Data\3GPP\Extracts\R2-2208384%20Correction%20on%20dormantBWP%20for%20RedCap%20in%20TS%2038.321.docx) Correction on dormantBWP for RedCap in TS 38.321 CATT CR Rel-17 38.321 17.1.0 1385 - F NR\_redcap-Core

* Continue in offline 114
* [AT119-e][114][RedCap] MAC corrections (vivo)

Initial scope: Discuss MAC corrections

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): Monday 2022-08-22 1200 UTC

Initial deadline (for rapporteur's summary in [R2-2208771](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208771.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208771](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208771.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Updated scope: Discuss remaining MAC corrections

Updated 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)

Updated deadline (for companies' feedback): Thursday 2022-08-25 1200 UTC

Updated deadline (for rapporteur's summary in R2-2208785): Thursday 2022-08-25 1400 UTC

Proposals marked "for agreement" in R2-2208785 not challenged until Friday 2022-08-26 02:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue online).

[R2-2208771](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208771.zip) [offline-114] MAC corrections vivo discussion Rel-17 NR\_redcap-Core

Proposals for easy agreement:

Proposal 1: [To agree] [13/13]: The 1st change in [R2-2207746] is agreed.

* Agreed

Proposal 2: [To agree] [12/13]: The corresponding change to remove the dormant BWP related part for RedCap UEs in [R2-2207746]/[ R2-2208384] are agreed.

- Ericsson is fine but the changes in the two CRs references by P2 are not exactly the same (the first listed CR seems more correct). Ok to leave this to the MAC rapporteur though.

- vivo agrees the CRs are slightly different and is fine to handle this during CR implementation

* Agreed

Proposal 5: [To agree] [13/13]: The change provided in [R2-2207010] is agreed by removing the dormantBWP-Id related part.

* Agreed

Proposal 6: [To agree] [11/13]: RAN2 understand spCell-BFR-CBRA can be supported by a RedCap UE. No spec impact.

* Agreed

Proposals need further online discussion:

Proposal 3a: [To agree] [11/12]: If searchSpaceOtherSystemInformation is not configured on the initialDownlinkBWP-RedCap, PDCCH monitoring for SI acquisition should not be performed on initialDownlinkBWP-RedCap, but should be performed on the one configured with the searchSpaceOtherSystemInformation.

- HW suggests to discuss the revised proposal:

“If searchSpaceOtherSystemInformation is not configured on the initialDownlinkBWP-RedCap, PDCCH monitoring for SI acquisition should not be performed by searchSpaceOtherSystemInformation on initialDownlinkBWP-RedCap;

If searchSpaceOtherSystemInformation is not configured on the initialDownlinkBWP-RedCap and RedCap specific BWP includes CD-SSB and CORSET#0, as in legacy, PDCCH monitoring for SI acquisition should be performed by searchSpaceZero on initialDownlinkBWP-RedCap

If searchSpaceOtherSystemInformation is not configured on the initialDownlinkBWP-RedCap and RedCap specific BWP does NOT include CD-SSB and CORSET#0, PDCCH monitoring for SI acquisition should be performed on the one configured with the searchSpaceOtherSystemInformation.”

* Continue offline

Proposal 3b: [To discuss]: Further discuss whether/where/how to capture this behaviour.

* Continue offline

Proposal 4: [To discuss] [7 vs. 5]: The change proposed in [R2-2207009] is not essential and not agreed.

* Continue offline

Proposal 7: [To discuss][1]: RAN2 to discuss if Msg1-based SI request is transmitted on SUL, the RedCap UE should monitor the legacy initial DL BWP in order to correctly receive the RAR.

* Continue offline

Agreements via email – from offline 114:

1. The 1st change in [R2-2207746] is agreed.

2. The corresponding change to remove the dormant BWP related part for RedCap UEs in [R2-2207746]/[ R2-2208384] are agreed.

3. The change provided in [R2-2207010] is agreed by removing the dormantBWP-Id related part.

4. RAN2 understand spCell-BFR-CBRA can be supported by a RedCap UE. No spec impact.

R2-2208785 [offline-114] MAC corrections – second round vivo discussion Rel-17 NR\_redcap-Core

## 6.19 Coverage Enhancements

(NR\_cov\_enh-Core; leading WG: RAN1; REL-17; WID: [RP-211566](file:///C:\Data\3GPP\archive\RAN\RAN%2392\Tdocs\RP-211566.zip))

Tdoc Limitation: 2 tdoc

Common aspects related to RACH indication (in MSG1) / RACH partitioning shall be submitted to 6.18

### 6.19.1 Organizational

Rapporteur input, incoming LS etc. CR Rapporteurs may provide baseline correction CRs containing smaller corrections, text clarifications, etc - please contact the CR rapporteurs before providing contributions on those aspects.

Incoming LS

[R2-2206960](file:///C:\Data\3GPP\Extracts\R2-2206960_R4-2211225.docx) Reply LS to RAN1/RAN2 on DMRS bundling (R4-2211225; contact: MediaTek) RAN4 LS in Rel-17 NR\_cov\_enh To:RAN1, RAN2

* Noted

RRC CR

[R2-2207891](file:///C:\Data\3GPP\Extracts\R2-2207891%20Miscellaneous%20corrections%20to%20NR%20coverage%20enhancements.doc) Miscellaneous corrections to NR coverage enhancements Huawei, HiSilicon, China Telecom, ZTE Corporation CR Rel-17 38.331 17.1.0 3323 - F NR\_cov\_enh-Core

* Revised in [R2-22](javascript:void(0);)08768
* Continue in offline 112

R2-2208768 Miscellaneous corrections to NR coverage enhancements Huawei, HiSilicon, China Telecom, ZTE Corporation CR Rel-17 38.331 17.1.0 3323 1 F NR\_cov\_enh-Core

* [AT119-e][112][CovEnh] RRC corrections Huawei)

Scope: Update the RRC CR

Intended outcome: Agreeable RRC CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for RRC CR in R2-2208768): Friday 2022-08-25 1000 UTC

### 6.19.2 General

All aspects.

DMRS bundling

[R2-2207130](file:///C:\Data\3GPP\Extracts\R2-2207130%20Discussion%20on%20Capability%20of%20DMRS%20Bundling.docx) Discussion on Capability of DMRS Bundling vivo discussion Rel-17 NR\_cov\_enh

Proposal 1: RAN2 captures in 38.306 that DM-RS bundling for PUSCH and PUCCH is only applicable for UL transmissions with pi/2 BPSK, BPSK, and QPSK modulation orders.

- HW thinks this is correct but should be discussed in the main session

* Agreed in principle. To be continued in the main session

Proposal 2: RAN2 captures in RRC spec that dmrs-BundlingPUCCH-Config or dmrs-BundlingPUSCH-Config can only be configured for a single uplink NR carrier at a time in the case of FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2.

- Mediatek thinks this is correct but not exhaustive, there are a few cases which are FFS

- HW agrees and then thinks we can wait

* RAN2 will wait for further feedback from RAN1 before updating the RRC spec

Proposal 3: RAN2 captures in RRC spec that neither dmrs-BundlingPUCCH-Config nor dmrs-BundlingPUSCH-Config is applicable for FR2-2.

* Agreed but we will update the specs only after receiving RAN1 feedback related to p2.

Proposal 4: Adopt the text proposals in Annex.

Agreements:

1. RAN2 will wait for further feedback from RAN1 on the DMRS bundling scenarios before updating the RRC spec. At that point RAN2 will also capture in the RRC spec that neither dmrs-BundlingPUCCH-Config nor dmrs-BundlingPUSCH-Config is applicable for FR2-2.

[R2-2208184](file:///C:\Data\3GPP\Extracts\R2-2208184%20-%20Correction%20of%20need%20codes%20and%20field%20descriptions%20for%20DMRS%20bundling.docx) Correction of need codes and field descriptions for DMRS bundling Ericsson CR Rel-17 38.331 17.1.0 3375 - F NR\_cov\_enh-Core

- HW thinks this is NBC and then thinks we can live without this. QC has the same view

- Ericsson thinks we should have a clean spec and align to what has been done in the rest of the RRC CRs

- [after the online session] QC acknowledges this is an ASN.1 NBC CR but with no functional change (UE behavior before vs after the change seems to be the same) and are then fine with the CR

* [after consultation with RAN2 Chair] Changes to need codes can still be allowed in this meeting, even if they lead to functional changes (which by the way is not the case with this CR).
* The CR is agreed in principle. Continue in offline 112 to merge it with the rapporteur CR

Other

[R2-2207132](file:///C:\Data\3GPP\Extracts\R2-2207132_CR0497_38300_Clarification%20on%20only%20CE%20RACH%20Resources.docx) Clarification on only CE RACH Resources vivo CR Rel-17 38.300 17.1.0 0497 - F NR\_cov\_enh

## 7.2 NB-IoT and eMTC support for NTN

Tdoc Limitation: 5 tdocs

### 7.2.1 Organizational

LSs, rapporteur inputs and other organizational documents. CR Rapporteurs may provide baseline correction CRs containing smaller corrections, text clarifications, etc - please contact the CR rapporteurs before providing contributions on those aspects.

Incoming LS

[R2-2206933](file:///C:\Data\3GPP\Extracts\R2-2206933_R3-224007.doc) Reply LS on open issues for NB-IoT and eMTC support for NTN (R3-224007; contact: ZTE) RAN3 LS in Rel-17 LTE\_NBIOT\_eMTC\_NTN To:RAN2, SA2

* Noted

[R2-2206938](file:///C:\Data\3GPP\Extracts\R2-2206938_R4-2210571.docx) LS reply on UE capability for 16QAM for NB-IoT (R4-2210571; contact: Ericsson) RAN4 LS in Rel-16 NB\_IOTenh4\_LTE\_eMTC6-Core To:RAN1 Cc:RAN2

* Noted

[R2-2206961](file:///C:\Data\3GPP\Extracts\R2-2206961_S1-221290.docx) Reply LS on Emergency services and UE rejected with "PLMN not allowed to operate in the country of the UE’s location" (S1-221290; contact: Apple) SA1 LS in Rel-17 5GSAT\_ARCH-CT To:CT1, RAN2 Cc:SA2, SA3LI

* Noted

RRC CR

[R2-2207153](file:///C:\Data\3GPP\Extracts\R2-2207153%20Miscellaneous%20corrections%20to%20TS%2036.331%20for%20IoT%20NTN.docx) Miscellaneous corrections to TS 36.331 for IoT NTN Huawei, HiSilicon CR Rel-17 36.331 17.1.0 4832 - F LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 105
* Revised in R2-2208784

R2-2208784 Miscellaneous corrections to TS 36.331 for IoT NTN Huawei, HiSilicon CR Rel-17 36.331 17.1.0 4832 1 F LTE\_NBIOT\_eMTC\_NTN

### 7.2.2 User Plane

Impacts to 36.321, 36.322, 36.323, 37.324

Contention resolution timer

[R2-2207056](file:///C:\Data\3GPP\Extracts\R2-2207056-%20Discussion%20on%20mac-ContentionResolutionTimer%20in%20IoT%20NTN.doc) Discussion on mac-ContentionResolutionTimer in IoT NTN OPPO discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 104

[R2-2207351](file:///C:\Data\3GPP\Extracts\36321_CR1544_(Rel-17)_R2-2207351%20CR%20timer%20expiry.docx) Clarification on the expiry of the contention resolution timer. Qualcomm Incorporated CR Rel-17 36.321 17.1.0 1544 - F LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 104

[R2-2207600](file:///C:\Data\3GPP\Extracts\R2-2207600%20Discussion%20on%20the%20mac-ContentionResolutionTimer.doc) Discussion on MSG3 retransmission Huawei, HiSilicon discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 104

[R2-2207824](file:///C:\Data\3GPP\Extracts\R2-2207824%20Discussion%20on%20contention%20resolution%20timer%20in%20IoT%20NTN.docx) Discussion on contention resolution timer in IoT NTN ZTE Corporation, Sanechips discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN-Core

* Discussed in offline 104

[R2-2208563](file:///C:\Data\3GPP\Extracts\R2-2208563%20Issue%20on%20false%20claiming%20of%20contention%20resolution%20failure.docx) Issue on false claiming of contention resolution failure for IoT NTN Nokia, Nokia Shanghai Bell discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 104
* [AT119-e][104][IoT-NTN] CR timer (ZTE)

Initial scope: Discuss corrections related to contention resolution timer (from proposals in R2-2207056, R2-2207351, R2-2207600, R2-2207824, R2-2208563)

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 2022-08-18 0600 UTC

Initial deadline (for rapporteur's summary in [R2-2208754](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208754.zip)): Thursday 2022-08-18 1000 UTC

[R2-2208754](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208754.zip) [offline-104] CR timer ZTE Corporation discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

[Easy Agreements]

(11/11) Proposal 1: RAN2 needs to address the issue of unintended declaration of Contention Resolution failure after MSG3 is retransmitted.

* Agreed

[To be discussed]

(6/10) Proposal 2: RAN2 confirms that blind Msg3 retransmission/early Msg4 transmission is possible or already can be supported in IoT NTN.

- Chair thinks this was already discussed without conclusion so far.

- CATT thinks we can follow the majority but also thinks it’s not so necessary

- QC is fine with p2 for blind msg3 rext, but not sure about early msg4. Oppo agrees with msg4.

- ZTE agrees that there could be some complications for msg4

* RAN2 confirms that blind Msg3 retransmission is supported in IoT NTN.

- IDC wonders whether we need to add an FFS for blind msg3 retx for initial retx. QC agrees

(8/10) Proposal 3: If RAN2 can confirm the understanding in proposal 2, RAN2 specify that expiration of mac-ContentionResolutionTimer is not considered as contention resolution failure (or UE ignores expiration of mac-ContentionResolutionTimer) when a Msg3 retransmission is scheduled. It’s common understanding that UE doesn’t monitor PDCCH if CR timer is not running.

* RAN2 specifies that expiration of mac-ContentionResolutionTimer is not considered as contention resolution failure (or UE ignores expiration of mac-ContentionResolutionTimer) when a Msg3 retransmission is scheduled. Continue the discussion in offline 106 on the exact details

- Oppo wonders whether we then follow the NR NTN approach. VC and ZTE understanding is that at high level this is the case but we still need to check the CR details

* RAN2 common understanding is that UE doesn’t monitor PDCCH if CR timer is not running (no specification impact)

(6/6) Proposal 4: If the proposal 3 can be agreed, RAN2 further discuss how to exactly implement it with reference to the text proposals in R2-2207824 [4] or R2-2208563 [5].

* Agreed

(7/10) Proposal 5: The option that UE stops mac-ContentionResolutionTimer when a Msg3 retransmission is scheduled is not pursued.

* Agreed

Agreements:

1. RAN2 needs to address the issue of unintended declaration of Contention Resolution failure after MSG3 is retransmitted.
2. RAN2 confirms that blind Msg3 retransmission is supported in IoT NTN.
3. RAN2 specifies that expiration of mac-ContentionResolutionTimer is not considered as contention resolution failure (or UE ignores expiration of mac-ContentionResolutionTimer) when a Msg3 retransmission is scheduled. Continue the discussion on the exact details
4. The option that UE stops mac-ContentionResolutionTimer when a Msg3 retransmission is scheduled is not pursued.

RAN2 understanding:

1. RAN2 common understanding is that UE doesn’t monitor PDCCH if CR timer is not running (no specification impact)

deltaPDCCH

[R2-2207064](file:///C:\Data\3GPP\Extracts\R2-2207064%20Correction%20on%20the%20definition%20of%20deltaPDCCH%20in%20(UL)%20HARQ%20RTT%20Timer%20for%20NB-IoT%20NTN.docx) Correction on the definition of deltaPDCCH in (UL) HARQ RTT Timer for NB-IoT NTN OPPO CR Rel-17 36.321 17.1.0 1542 - F LTE\_NBIOT\_eMTC\_NTN

- Oppo thinks that RTToffset is missing

- ZTE agrees with the principle but prefers the wording in [R2-2207817](file:///C:\Data\3GPP\Extracts\R2-2207817%2036321CR_Correction%20for%20RTToffset%20in%20HARQ%20RTT%20timers.docx)

- Oppo would like to discuss more to understand why this is not agreeable.

- ZTE is fine also with this wording

* Agreed in principle (continue in offline 106 to finalize the wording and to merge the change in the rapporteur CR)

[R2-2207817](file:///C:\Data\3GPP\Extracts\R2-2207817%2036321CR_Correction%20for%20RTToffset%20in%20HARQ%20RTT%20timers.docx) 36321CR\_Corrections for RTToffset in HARQ RTT timers ZTE Corporation, Sanechips CR Rel-17 36.321 17.1.0 1545 - F LTE\_NBIOT\_eMTC\_NTN-Core

- Ericsson supports this

* First change is agreed (continue in offline 106 to merge the change in the rapporteur CR)

Triggering of TA reporting

[R2-2207599](file:///C:\Data\3GPP\Extracts\R2-2207599%20Discussion%20on%20the%20triggering%20of%20TA%20reporting.doc) Discussion on the triggering of TA reporting Huawei, HiSilicon discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 106

[R2-2208387](file:///C:\Data\3GPP\Extracts\R2-2208387%20Correction%20on%20TA%20Reporting%20Triggering%20Condition%20for%20IoT%20NTN%20in%20TS%2036.321%20final%20clean.docx) Correction on TA Reporting Triggering Condition for IoT NTN in TS 36.321 CATT CR Rel-17 36.321 17.1.0 1546 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 106

PDCCH-based HARQ feedback

[R2-2207349](file:///C:\Data\3GPP\Extracts\36321_CR1543_(Rel-17)_R2-2207349%20PDCCH%20based%20HQ%20FB.docx) Clarification on PDCCH-based HARQ feedback Qualcomm Incorporated CR Rel-17 36.321 17.1.0 1543 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 106

Misc issues

[R2-2208664](file:///C:\Data\3GPP\Extracts\R2-2208664%20-%20R17%20IoT%20NTN%20User%20Plane%20issues.docx) R17 IoT NTN User Plane issues Ericsson discussion Rel-17

* Continue in offline 106
* [AT119-e][106][IoT-NTN] MAC corrections (Mediatek)

Initial scope: Discuss remaining MAC corrections

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): Monday 2022-08-22 1200 UTC

Initial deadline (for rapporteur's summary in [R2-2208757](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208757.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208757](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208757.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Updated scope: Discuss remaining MAC corrections

Updated 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)

Updated deadline (for companies' feedback): Wednesday 2022-08-24 1800 UTC

Updated deadline (for rapporteur's summary in R2-2208780): Wednesday 2022-08-24 2200 UTC

[R2-2208757](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208757.zip) [offline-106] MAC corrections Mediatek discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

Proposals for Agreement:

Proposal 2 (9/9): The deltaPDCCH related changes in “Section 7.7 HARQ RTT Timers” of TS 36.321 Rel-17, proposed in CRs R2-2207064 [4] and R2-2207817 [5] are agreed.

* Agreed

Proposal 3 (7/9): The eMTC RTTOffset related changes in “Section 7.7 HARQ RTT Timers” of 36.321 Rel-17, proposed in R2-2207817 [5] are agreed.

* Agreed

Proposal 4 (9/9): The textual changes in “Section 5.4.9 Timing Advance Reporting” of 36.321 Rel-17, proposed in R2-2207599 [6] and R2-2208387 [7] are agreed.

* Agreed

Proposal 5 (6/7): RAN2 confirms that there is no issue in the use of PDCCH-based HARQ ACK feedback in NTN. The change “if connected to non-terrestrial network …” in “Section 5.7 Discontinuous Reception (DRX)”, suggested in CR R2-2207349 [8], is not pursued in Rel-17 36.321.

- Oppo thinks that a number of companies confirmed the issue as valid but other companies just do not agree to the proposed change. Therefore, it may not be appropriate to summarize that there is no issue in the use of PDCCH-based HARQ ACK feedback in NTN. If there is no time to discuss in this meeting, we suggest this can be postponed to the next meeting together with P6.

* Continue offline

Proposal 6 (4/5): RAN2 confirms that there is no issue in the use of PDCCH-based HARQ ACK feedback in NTN. The change “… for which the first repetition occurred RTToffset earlier” in “Section 5.7 Discontinuous Reception (DRX)”, suggested in CR R2-2207349 [8], is not pursued in Rel-17 36.321.

* Continue offline

Proposal 7 (6/8): The changes suggested in in P1 of CR R2-2208664 [9] are not pursued in Rel-17 36.321.

- Ericsson think that p7 and p8 require further discussion.

* Continue offline

Proposal 8 (6/8): The changes suggested in in P2 of CR R2-2208664 [9] are not pursued in Rel-17 36.321.

* Continue offline

Proposal 9 (5/7): The changes suggested in in P3 of CR R2-2208664 [9] are agreed for Rel-17 36.321.

* Agreed

Proposal 10 (8/8): The changes suggested in in P4 of CR R2-2208664 [9] are agreed for Rel-17 36.321.

* Agreed

Proposals for Discussion:

Proposal 1: RAN2 to discuss and finalize the TP for inclusion in TS 36.321 Rel-17.

- Ericsson prefers the solution based on R2-2208563

- regarding the CR text to support blind Msg3 retx in IoT NTN, since the intention in IoT NTN and NR NTN is the same and the topic has been fully discussed in NR NTN, Nokia thinks the simple way-forward is to reuse what agreed in NR NTN.

* Continue offline

R2-2208780 [offline-106] MAC corrections – second round Mediatek discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

For Agreements:

Proposal 5-6 (6/7): The PDCCH-based HARQ feedback issue and its associated changes are not pursued in Rel-17 IoT-NTN.

- QC understands that companies think this issue is handled by network implementation, i.e., again claim is network is smart and it knows when to send ack and when not. So QC suggests to revised as: “RAN2 assumes the PDCCH-based HARQ feedback issue is handled by network implementation ~~and its associated changes are not pursued in Rel-17 IoT-NTN.”~~

Proposal 9-10 (4/6): The changes suggested in P1 and P2 of CR R2-2208664 [9] are agreed for TS 36.321 R17.

- QC thinks there is no issue and proposal 9-10 is radical change to HARQ timer start in LTE. The network should be aware when the UE is monitoring PDCCH and should be able to schedule accordingly, if it cannot, then network should know why it cannot schedule. In addition, network should configure the value of DRX timers and Koffset properly. If there is such large gap between PDSCH and PUCCH, then there is some not good parameter configuration. That’s why there are TA report and UE specific Koffset, which is not useless after all. So QC does not agree the proposal 9-10.

For Discussion (CB Session):

Proposal 1: RAN2 to discuss and select between Alt 1 and Alt 6 as the TP for CR timer.

### 7.2.3 RRC

Impacts to 36.331

Pre-compensation gaps for segmented transmission

[R2-2207059](file:///C:\Data\3GPP\Extracts\R2-2207059-%20Discussion%20on%20segmented%20precompensation%20gap%20configuration%20in%20IoT%20NTN.doc) Discussion on segmented precompensation gap configuration in IoT NTN OPPO discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 105

[R2-2207308](file:///C:\Data\3GPP\Extracts\R2-2207308%20Add%20TX%20gap%20parameter%20and%20capability%20for%20IoT%20NTN%2036.331.docx) Add TX gap parameter and capability for IoT NTN MediaTek Inc. CR Rel-17 36.331 17.1.0 4833 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Discussed in offline 105

[R2-2208684](file:///C:\Data\3GPP\RAN2\Docs\R2-2208684.zip) RRC changes for Gap configuration for uplink segemented tansmission in IoT-NTN Nokia, Nokia SHanghai Bell CR Rel-17 36.331 17.1.0 4852 2 B LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 105

coarse UE location reporting

[R2-2208294](file:///C:\Data\3GPP\Extracts\R2-2208294%20CR%2036331-4856%20Rel-17%20IoT%20NTN%20coarse%20location.docx) Correction to coarseLocationInfo field description for IoT NTN Eutelsat S.A. CR Rel-17 36.331 17.1.0 4856 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Discussed in offline 105

[R2-2208574](file:///C:\Data\3GPP\Extracts\R2-2208574%2036.331%20cr%20correction%20on%20coarselocationreq.docx) correction on coarselocationreq Xiaomi, Thales CR Rel-17 36.331 17.1.0 4863 - F LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 105

neighbour cell ephemeris

[R2-2207150](file:///C:\Data\3GPP\Extracts\R2-2207150%20Discussion%20on%20neighbour%20cell%20ephemeris.doc) Discussion on neighbour cell ephemeris Huawei, HiSilicon discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 105

[R2-2207151](file:///C:\Data\3GPP\Extracts\R2-2207151%20Correction%20to%2036.331%20on%20neighbour%20cell%20ephemeris.docx) Correction to 36.331 on neighbour cell ephemeris Huawei, HiSilicon CR Rel-17 36.331 17.1.0 4831 - F LTE\_NBIOT\_eMTC\_NTN

* Discussed in offline 105
* [AT119-e][105][IoT-NTN] RRC corrections (Huawei)

Initial scope: Discuss corrections related to pre-compensation gaps for segmented transmission, coarse UE location reporting and neighbour cell ephemeris (from proposals in R2-2207059, R2-2207308, R2-2208684, R2-2208294, R2-2208574, R2-2207150, R2-2207151)

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 2022-08-18 0600 UTC

Initial deadline (for rapporteur's summary in [R2-2208755](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208755.zip)): Thursday 2022-08-18 1000 UTC

Updated scope: Discuss remaining RRC corrections

Updated 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)

Updated deadline (for companies' feedback): Monday 2022-08-22 1200 UTC

Updated deadline (for rapporteur's summary in [R2-2208756](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208756.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208756](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208756.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Update the RRC CR considering the meeting agreements

Final intended outcome: Agreeable RRC CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for RRC CR in R2-2208784): Friday 2022-08-26 0800 UTC

[R2-2208755](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208755.zip) [offline-105] RRC corrections Huawei discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

(10/11) Proposal 1: Introduce UL gap configuration for PUSCH/PUCCH/NPUSCH segmented transmission.

- CATT wonders how the NW configures the gap. HW thinks there are not many options to choose from and it’s easy for the NW to configure the gap. HW agrees that it would be possible to leave it to UE implementation but RAN1 has already decided to go this way.

- QC thinks we should add at the end “based on the reported UE capability”. HW agrees

* Introduce UL gap configuration for PUSCH/PUCCH/NPUSCH segmented transmission, based on the reported UE capability

(8/12) Proposal 2: PUSCH and PUCCH segmented transmission use the same gap configuration.

* Agreed

(6/11) Proposal 3: The changes in R2-2208574 are not pursued.

- Xiaomi thinks we should have this, similarly to what we have for MDT, but are open to discuss where to put it

- QC thinks this is transparent to the UE so it should be transparent to the UE, so it should not be in RAN2 specs and for sure not in Stage 3. Ericsson agrees. ZTE agrees. Mediatek agrees

- HW thinks that in any case the sentence is not entirely correct so for the moment would not support it.

- Intel/CATT/Sony/Nokia thinks there is no need to clarify this

- Apple thinks we can send a LS to RAN3 on this.

* Agreed

(9/10) Proposal 4: The changes in R2-2208294 are agreed.

* Agreed

(7/12) Proposal 5: In this release, the NW will not broadcast satellite assistance information for neighbour cells for measurement/mobility purposes.

- HW indicates that RAN4 thinks that ephemeris information is needed for NR NTN and did not discuss for IoT NTN only due to lack of time so there is a risk we need to come back to this. QC agrees with HW

- QC thinks that broadcasting of assistance information for neighbour cell is already possible

- ZTE suggests to reword as: “in R17, neighbour cell ephemeris information would not be introduced in SIB31”. Oppo supports this

* Discussion on the introduction of cell ephemeris information in SIB31 is on hold until we receive feedback from RAN4 on this, if any

(8/11) Proposal 6: The changes in R2-2207151 are not pursued.

Agreements:

1. Introduce UL gap configuration for PUSCH/PUCCH/NPUSCH segmented transmission, based on the reported UE capability
2. PUSCH and PUCCH segmented transmission use the same gap configuration.
3. The changes in R2-2208574 are not pursued
4. The changes in R2-2208294 are agreed
5. Discussion on the introduction of cell ephemeris information in SIB31 is on hold until we receive feedback from RAN4 on this, if any

[R2-2208756](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208756.zip) [offline-105] RRC corrections – second round Huawei discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

Proposals for email agreement:

(13/13) Proposal 1: Postpone R2-2207057 and R2-2207790 and wait for RAN1 progress.

* Agreed

(12/13) Proposal 2: R2-2207311 is not pursued.

* Agreed

(12/13) Proposal 3: R2-2207350 is not pursued.

* Agreed

(8/13) Proposal 4: R2-2207152 is not pursued.

* Agreed

(12/13) Proposal 5: R2-2207789 is not pursued.

- ZTE has some concerns with this. The main ambiguity is that, when elevationAngleLeft is absent in elevationAngles, whether the value of field elevationAngleRight can always be applies to elevationAngleLeft? For example, if radius is also provided, can UE still apply elevationAngleRight to elevationAngleLeft? ZTE suggests to further discuss this specific issue and to rewording p5 as “Proposal 5: RAN2 discuss whether elevationAngleRight can be applied to elevationAngleLeft when elevationAngleLeft is absent but radius is present.”

- HW thinks that if the satellite is not perpendicular to the earth ground, the NW can provide “left + right + radius” or providing “left + right, without radius”, both configuration work. The only improper configuration is providing “right + radius, without left”, which may cause misunderstanding as mentioned by ZTE. But the issue can be avoided by NW implementation.

- ZTE has as different understanding. ZTE thinks "left + right + radius" may be the incorrect configuration while "right + radius, without left "would be suitable one. Without consistent understanding on the specification, correct UE/NW implementation cannot be guaranteed. For "right + radius, without left" configuration, ZTE assumes UE can deduce "left" and also coverage, based on other parameters. Then if "left" is still provided by network, it may cause confusion in UE side if the "left" calculated by UE itself is different from the configured one.

* Continue online

Proposal 6: R2-2208665 is not pursued.

* Agreed

(11/13) Proposal 7: R2-2207353 is not pursued.

* Agreed

(11/12) Proposal 8: R2-2208564 is not pursued.

* Agreed

(8/12) Proposal 9: R2-2208681 is postponed.

* Agreed

Proposal 10: Changes in R2-2207309 is agreed with removing “and the UE shall delete any existing value for this field” in the description of the conditional presence.

* Agreed

Proposal 11: Changes in R2-2207310 are replaced by adding “ECI” in the description of the IE EphemerisOrbitalParameters.

* Agreed

Proposal 12: For R2-2207791, adopt the change of adding “for the serving cell” and the changes to ntn-ScenarioSupport in UE-Capbility-NB (also fix the typo in ntn-ScenarioSupport of UE-EUTRA-Capability), other changes are not pursued.

* Agreed

Proposal 13: Changes in R2-2208129 are not pursued.

* Agreed

Proposal 14: 1st and 3rd change of R2-2207153 are adopted.

* Agreed

Agreements via email – from offline 105:

1. Postpone R2-2207057 and R2-2207790 and wait for RAN1 progress.
2. R2-2207311 is not pursued.
3. R2-2207350 is not pursued.
4. R2-2207152 is not pursued.
5. R2-2208665 is not pursued.
6. R2-2207353 is not pursued.
7. R2-2208564 is not pursued.
8. R2-2208681 is postponed.
9. Changes in R2-2207309 is agreed with removing “and the UE shall delete any existing value for this field” in the description of the conditional presence.
10. Changes in R2-2207310 are replaced by adding “ECI” in the description of the IE *EphemerisOrbitalParameters*.
11. For R2-2207791, adopt the change of adding “for the serving cell” and the changes to *ntn-ScenarioSupport* in *UE-Capbility-NB* (also fix the typo in *ntn-ScenarioSupport* of *UE-EUTRA-Capability*), other changes are not pursued.
12. Changes in R2-2208129 are not pursued.
13. 1st and 3rd change of R2-2207153 are adopted.

Other SIB31 related issues

[R2-2207057](file:///C:\Data\3GPP\Extracts\R2-2207057-%20Correction%20to%20RRC-MAC%20interaction%20on%20UL%20synchronisation%20in%20IoT%20NTN.doc) Correction to RRC-MAC interaction on UL synchronisation in IoT NTN OPPO CR Rel-17 36.331 17.1.0 4827 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 105

[R2-2207790](file:///C:\Data\3GPP\Extracts\R2-2207790%20Discussion%20on%20epochTime%20in%20SIB31.docx) Discussion on epochTime in SIB31 ZTE Corporation, Sanechips discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

[R2-2207311](file:///C:\Data\3GPP\Extracts\R2-2207311%20Trigger%20RLF%20when%20determining%20SIB31%20cannot%20be%20acquired%20during%20T318.docx) Trigger RLF when SIB31 cannot be acquired during T318 MediaTek Inc. CR Rel-17 36.331 17.1.0 4836 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

[R2-2207350](file:///C:\Data\3GPP\Extracts\36331_CR4840_(Rel-17)_R2-2207350%20Koffset%20update.docx) Indication of Koffset update in SIB31 Qualcomm Incorporated CR Rel-17 36.331 17.1.0 4840 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 105

SIB32 related issues

[R2-2207152](file:///C:\Data\3GPP\Extracts\R2-2207152%20Discussion%20on%20parameters%20for%20discontinuous%20coverage.doc) Discussion on parameters for discontinuous coverage Huawei, HiSilicon discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 105

[R2-2207789](file:///C:\Data\3GPP\Extracts\R2-2207789%20Discussion%20on%20footprint%20parameters%20in%20SIB32.docx) Discussion on footprint parameters in SIB32 ZTE Corporation, Sanechips discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

Mobility related issues

[R2-2207353](file:///C:\Data\3GPP\Extracts\36331_CR4842_(Rel-17)_R2-2207353%20TN%20redirection.docx) RRC Release with redirection to TN Qualcomm Incorporated CR Rel-17 36.331 17.1.0 4842 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 105

[R2-2208564](file:///C:\Data\3GPP\Extracts\R2-2208564%20Issue%20on%20GNSS%20measurement%20during%20eMTC%20handover.docx) Issue on GNSS measurement during eMTC handover Nokia, Nokia Shanghai Bell discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 105

[R2-2208681](file:///C:\Data\3GPP\Extracts\R2-2208681_NTN%20Configuration%20at%20CHO.docx) NTN Configuration at CHO Sequans Communications discussion Rel-17 36.331 LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

Misc issues

[R2-2207309](file:///C:\Data\3GPP\Extracts\R2-2207309%20Correction%20on%20IoT%20NTN%20ASN.1.docx) Correction on IoT NTN ASN.1 MediaTek Inc. CR Rel-17 36.331 17.1.0 4834 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

[R2-2207310](file:///C:\Data\3GPP\Extracts\R2-2207310%20Specify%20ECI%20to%20the%20reference%20frame%20of%20orbital%20parameters.docx) Specify ECI to the reference frame of orbital parameters MediaTek Inc. CR Rel-17 36.331 17.1.0 4835 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

[R2-2207791](file:///C:\Data\3GPP\Extracts\R2-2207791%2036331CR_RRC%20miscellaneous%20corrections.docx) 36331CR\_RRC miscellaneous corrections ZTE Corporation, Sanechips CR Rel-17 36.331 17.1.0 4851 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 105

[R2-2208129](file:///C:\Data\3GPP\Extracts\R2-2208129_36331-Misc-Correction.docx) Miscellanious Corrections to RRC for IoT-NTN Nokia, Nokia Shanghai Bell CR Rel-17 36.331 17.1.0 4853 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 105

[R2-2208665](file:///C:\Data\3GPP\Extracts\R2-2208665%20-%20R17%20IoT%20NTN%20RRC%20Corrections.docx) R17 IoT NTN RRC Corrections Ericsson discussion Rel-17

* Continue in offline 105

Revised / Withdrawn

[R2-2208043](file:///C:\Data\3GPP\Extracts\R2-2208043-36331-RRC-Changes-Precomp-Gap.docx) RRC changes for Gap configuration for uplink segemented tansmission in IoT-NTN Nokia, Nokia SHanghai Bell CR Rel-18 36.331 17.1.0 4852 - B LTE\_NBIOT\_eMTC\_NTN

=> Revised in R2-2208682

R2-2208682 RRC changes for Gap configuration for uplink segemented tansmission in IoT-NTN Nokia, Nokia SHanghai Bell CR Rel-18 36.331 17.1.0 4852 1 B LTE\_NBIOT\_eMTC\_NTN

=> Revised in [R2-2208684](file:///C:\Data\3GPP\RAN2\Docs\R2-2208684.zip)

R2-2208038 Miscellanious corrections to RRC for for IoT-NTN Nokia Solutions & Networks (I) CR Rel-18 38.331 17.1.0 3345 - F LTE\_NBIOT\_eMTC\_NTN Withdrawn

### 7.2.4 Idle Inactive mode

Impacts to 36.304

[R2-2208138](file:///C:\Data\3GPP\Extracts\R2-2208138.docx) Correction on Measurement rules for cell re-selection for IoT NTN Samsung R&D Institute UK CR Rel-17 36.304 17.1.0 0851 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 107

[R2-2208669](file:///C:\Data\3GPP\Extracts\R2-2208669%20-%20R17%20IoT%20NTN%20Idle%20mode%20issues.docx) R17 IoT NTN Idle mode issues Ericsson discussion Rel-17

* Continue in offline 107
* [AT119-e][107][IoT-NTN] Idle mode corrections (Ericsson)

Initial scope: Discuss idle mode corrections

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): Monday 2022-08-22 1200 UTC

Initial deadline (for rapporteur's summary in [R2-2208758](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208758.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208758](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208758.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Draft the 36.304 CR considering the meeting agreements

Final intended outcome: Agreeable 36.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for 36.304 CR in R2-2208781): Friday 2022-08-26 0800 UTC

[R2-2208758](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208758.zip) [offline-107] Idle mode corrections Ericsson discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

Proposal 1 The changes in R2-2208138 are not pursued.

* Agreed

Proposal 2 Align the wording with NR NTN and adopt the TP in R2-2208669 to introduce “PLMNs not allowed to operate at the present UE location” in table 4.2 (AS/NAS functional division) in TS 36.304

* Agreed

### 7.2.5 UE capabilities

Pre-compensation gaps for segmented transmission

[R2-2207058](file:///C:\Data\3GPP\Extracts\R2-2207058-%20Discussion%20on%20UE%20capability%20on%20segmented%20precompensation%20gap%20in%20IoT%20NTN.doc) Discussion on UE capability on segmented precompensation gap in IoT NTN OPPO discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 108

[R2-2207307](file:///C:\Data\3GPP\Extracts\R2-2207307%20Add%20TX%20gap%20capability%20for%20IoT%20NTN%2036.306.docx) Add TX gap capability for IoT NTN MediaTek Inc. CR Rel-17 36.306 17.1.0 1854 - F LTE\_NBIOT\_eMTC\_NTN-Core

* Continue in offline 108

[R2-2208044](file:///C:\Data\3GPP\Extracts\R2-2208044_36306-UE-Capability-correction.docx) New UE capability for Pre-compensation-gap for IoT-NTN Nokia, Nokia Shanghai Bell CR Rel-18 36.306 17.1.0 1855 - B LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 108

Other

[R2-2207352](file:///C:\Data\3GPP\Extracts\36331_CR4841_(Rel-17)_R2-2207352%20TN%20support%20indication.docx) Reporting the support of TN bands to NTN Qualcomm Incorporated CR Rel-17 36.331 17.1.0 4841 - F LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 108

[R2-2208666](file:///C:\Data\3GPP\Extracts\R2-2208666%20-%20R17%20IoT%20NTN%20UE%20Capabilities%20corrections.docx) R17 IoT NTN UE Capabilities corrections Ericsson discussion Rel-17

* Continue in offline 108
* [AT119-e][108][IoT-NTN] UE capabilities (Nokia)

Initial scope: Discuss corrections for UE capabilities

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): Monday 2022-08-22 1200 UTC

Initial deadline (for rapporteur's summary in [R2-2208759](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208759.zip)): Monday 2022-08-22 2000 UTC

Proposals marked "for agreement" in [R2-2208759](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208759.zip) not challenged until Tuesday 2022-08-23 08:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue offline).

Final scope: Draft 36.306 CR considering the meeting agreements

Final intended outcome: Agreeable 36.306 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for 36.306 CR in R2-2208789): Friday 2022-08-26 0600 UTC

[R2-2208759](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208759.zip) [offline-108] UE capabilities Nokia discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

Proposal 1: Following TP is considered for 36.306 CR.

4.3.38.6 ntn-NeedSegmentedPrecompensationGaps-r17

• This field indicates the minimum gap value between segments for PUSCH and PUCCH required by ana UE supporting ce-ModeA-r13 or for NPUSCH required by a UE supporting UE-catagory-NB, for TA pre-compensation.

• This feature is only applicable if the UE supports ntn-Connectivity-EPC-r17.

• If a UE does not include this field but includes ntn-Connectivity-EPC-r17, the UE performs TA pre-compensation at slot boundaries and the number of symbols dropped due to pre-compensation is left to UE implementation.

- QC thinks we should change as:

“- This field indicates the supported gap length between segments for PUSCH, PUCCH and NPUSCH, when the UE performs segmented pre-compensation.

- This feature is only applicable if the UE supports UE-category-NB or ce-ModeA-r13 and ntn-Connectivity-EPC-r17.

- If a UE does not include this field but includes ntn-Connectivity-EPC-r17, the UE follows legacy behaviour at slot boundaries due to TA adjustment.”

- Oppo prefers the original wording

- Nokia agrees with QC

- Oppo can accept the wording of the first bullet but in general would like to check with RAN1

- Ericsson wonders about the second bullet and suggests to change as:

“- This feature is only applicable if the UE supports either UE-category-NB or ce-ModeA-r13 and it also supports ntn-Connectivity-EPC-r17.”

* Continue offline/online

Proposal 2: Changes in [4] is not pursued for Rel-17.

* Agreed

Proposal 3:Modify the description of standalone GNSS-Location to include IoT NTN use.

- QC thinks we should change “IOT NTN” into “eMTC NTN”

* Agreed as “Modify the description of standalone GNSS-Location to include eMTC NTN use”

Proposal 4:Clarify if GNSS capability for NB-IoT is implicit with the indication of ntn-Connectivity-EPC-r17.

* Agreed

Agreements via email – from offline 108:

1. Changes in [R2-2207352](file:///C:\Data\3GPP\Extracts\36331_CR4841_(Rel-17)_R2-2207352%20TN%20support%20indication.docx) is not pursued for Rel-17.
2. Modify the description of standalone GNSS-Location to include eMTC NTN use
3. Clarify if GNSS capability for NB-IoT is implicit with the indication of ntn-Connectivity-EPC-r17.

[R2-2208700](file:///C:\Data\3GPP\RAN2\Docs\R2-2208700.zip) LS On UE capability signalling for IoT-NTN Nokia LS out Rel-17 LTE\_NBIOT\_eMTC\_NTN To:SA2 Cc:CT1 Late

* Handled in the main session

### 7.2.6 Other

[R2-2208667](file:///C:\Data\3GPP\Extracts\R2-2208667%20-%20R17%20IoT%20NTN%20stage%202%20corrections.docx) R17 IoT NTN stage 2 corrections Ericsson discussion Rel-17 LTE\_NBIOT\_eMTC\_NTN

* Continue in offline 118
* [AT119-e][118][IoT-NTN] Stage-2 CR (Ericsson)

Scope: Draft Stage-2 CR

Intended outcome: Agreeable Stage-2 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for Stage-2 CR in R2-2208762): Friday 2022-08-25 1000 UTC

R2-2208762 IoT-NTN Stage-2 correction Ericsson CR Rel-17 36.300 17.1.0 XXXX - F LTE\_NBIOT\_eMTC\_NTN

## 8.6 IoT NTN enhancements

(xx-Core; leading WG: RAN1; REL-18; WID: RP-221806)

Time budget: 1 TU

Tdoc Limitation: 3 tdocs

### 8.6.1 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.

- Mediatek (rapporteur) thinks we can start the work on discontinuous coverage early next year.

- QC has a similar view but still there are some aspects that could start in RAN2 independently

- Oppo agrees with MTK

- ZTE agrees in principle but maybe starting next year is a bit late. November could be a better compromise

* No discussion on discontinuous coverage enhancements in Oct meeting.

### 8.6.2 Performance Enhancements

HARQ enhancements

[R2-2207060](file:///C:\Data\3GPP\Extracts\R2-2207060-%20Discussion%20on%20HARQ%20enhancement%20for%20IoT%20NTN.doc) Discussion on HARQ enhancement for IoT NTN OPPO discussion Rel-18 IoT\_NTN\_enh-Core

Observation 1 For NB-IoT UEs, HARQ stalling issue may cause much more signalling overhead for RRC connection re-establishment in LEO case, which is also not beneficial for UE power saving

Observation 2 For NB-IoT UEs, RRC connection re-establishment can be reduced by disabling HARQ feedback in LEO case since the HARQ process can be re-used with reduced stop-and-wait time.

Observation 3 For DL MAC CE, the action timing defined in PHY spec is relevant to the UL slot of the corresponding HARQ feedback transmission.

Observation 4 For NB-IoT UEs that is configured with only a single HARQ process, it would not be flexible if only the semi-static configuration is used.

Proposal 1 For DL HARQ operation, disabling HARQ feedback could apply to all NB-IoT and eMTC UEs in NTN.

- Ericsson thinks that RAN1 is discussing whether this is needed at all and then we could wait

- QC thinks it’s true that RAN1 is discussing but RRC is in control of RAN2 and we could also decide on that

- IDC thinks that RAN1 is discussing more how this could be disabled but not whether this should be supported

- NEC wonders what the meaning of “all” in p1. Oppo thinks this could apply to all IoT NTN types, but this does not mean it should be a mandatory feature

* Disabling DL HARQ feedback is supported for NB-IoT and eMTC NTN. FFS on UE capability

Proposal 2 For UL HARQ operation, introduce two HARQ modes, i.e., HARQ mode A and HARQ mode B in IoT NTN.

- Oppo thinks that for NR NTN we worked on both UL and DL based on the same wording of the objective as for the R18 IoT NTN WID.

- QC is not sure about the intention of the objective but agrees it could be useful to work on UL as well

- MTK would like to handle both DL and UL

- CMCC thinks the situation is similar as for NR NTN and then we can consider both, even if DL should have priority

- HW/ZTE also think we should consider UL

* For UL HARQ operation, introduce two HARQ modes, i.e., HARQ mode A and HARQ mode B in IoT NTN (both NB-IoT and eMTC NTN), similarly to NR NTN

Proposal 3 HARQ modeA/modeB mechanism could apply to all NB-IoT and eMTC UEs in NTN.

Proposal 4 For both NB-IoT and eMTC, enabling/disabling HARQ feedback can be configured per DL HARQ process via UE specific RRC signalling.

- Oppo wonders whether we can take this as a baseline as it would exclude CP solution for NB-IoT

- MTK thinks that for CP solution we can still use RRC based solution (e.g. msg4) so supports p4.

- ZTE agrees with MTK

- ZTE and MTK thinks that SIB cannot be used

- Ericsson would like to have only one mechanism and then wait for RAN1

- NEC thinks eMTC is similar to NR NTN and we should follow NR NTN at least for eMTC

- QC/MTK/Turkcell think that RRC signalling works for NB-IoT as well

* From RAN2 perspective, at least for eMTC, enabling/disabling HARQ feedback can be configured per DL HARQ process at least via UE specific RRC signalling. FFS for NB-IoT (and especially for CP solution for NB-IOT).
* Discuss in offline 119 whether to send an LS to RAN1 to inform of the RAN2 decision for eMTC, saying that we are still discussing for NB-IoT, and check if they have any concern with using RRC (in which case we can reconsider)

Proposal 5 For NB-IoT, enabling/disabling HARQ feedback can be configured per DL HARQ process via DCI on top of the RRC semi-static configuration.

Proposal 6 Send a LS to inform RAN1 about RAN2’s preference on enabling/disabling HARQ feedback configuration.

Proposal 7 For both NB-IoT and eMTC, HARQ mode is configured is configured per UL HARQ process via UE specific RRC signalling.

Proposal 8 Study impact of disable HARQ feedback and HARQ mode B on DRX for IoT NTN, using Rel-17 NR NTN solution as baseline.

Proposal 9 Don’t consider impact of HARQ mode A/B on LCP for IoT NTN.

Agreements:

1. Disabling DL HARQ feedback is supported for NB-IoT and eMTC NTN. FFS on UE capability
2. For UL HARQ operation, introduce two HARQ modes, i.e., HARQ mode A and HARQ mode B in IoT NTN (both NB-IoT and eMTC NTN), similarly to NR NTN
3. From RAN2 perspective, at least for eMTC, enabling/disabling HARQ feedback can be configured per DL HARQ process at least via UE specific RRC signalling. FFS for NB-IoT (and especially for CP solution for NB-IOT).

* [AT119-e][119][IoT-NTN] LS to RAN1 (Mediatek)

Scope: Discuss whether to send an LS to RAN1 to inform of the RAN2 decision for eMTC (on

enabling/disabling HARQ feedback via UE specific RRC signalling), saying that we are still discussing for NB-IoT, and checking if they have any concern with using RRC (in which case we can reconsider)

Intended outcome: LS to RAN1

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for final LS in R2-2208778): Friday 2022-08-26 1000 UTC

[R2-2207300](file:///C:\Data\3GPP\Extracts\R2-2207300_On%20Disabling%20HARQ%20in%20IoT-NTN.docx) On Disabling HARQ Feedback in IoT-NTN MediaTek Inc. discussion

Observation 1: Disabling HARQ feedback has the potential to increase data rates at the cost sacrificing robustness.

Proposal 1: RAN2 will reuse NR-NTN agreements to semi-statically enable/disable HARQ feedback using RRC signalling on per HARQ process.

Proposal 2: As NB-IoT CP solutions do not use RRC Reconfiguration, msg4 could be used to semi-statically enable/disable HARQ feedback in NB-IoT based NTN.

Observation 2: For NB-IoT, after disabling HARQ feedback, RLC can be enhanced to improve data transmission latency.

Proposal 3: For NB-IoT, shorten the AM RLC window size.

Proposal 4: For NB-IoT, add condition based on unacknowledged RLC PDU number and condition based on unacknowledged byte size to trigger polling.

Proposal 5: For NB-IoT, allow UE autonomously send STATUS report by SPS resource when detect a failure of an RLC PDU.

Proposal 6: For NB-IoT, allow UE autonomously send STATUS report by CFRA resource when detect a failure of an RLC PDU.

[R2-2207354](file:///C:\Data\3GPP\Extracts\R2-2207354%20IoT%20HARQ%20process.doc) HARQ process enhancements Qualcomm Incorporated discussion Rel-18 IoT\_NTN\_enh-Core

Proposal 1 RAN2 confirm HARQ stalling issue in uplink is not addressed.

Proposal 2 HARQ enable/disable is configured per HARQ process via UE specific RRC signaling.

Proposal 3 RAN2 address the impact of HARQ feedback disabled process in multiple TB scheduling.

(One quick fix is to clarify that the number of TBs i.e., “m” or “M” is the number of TBs for which HARQ feedback is enabled. The other simple solution is that network makes sure the scheduled TBs either all belongs to HARQ feedback enabled process or HARQ feedback disabled process.)

[R2-2207484](file:///C:\Data\3GPP\Extracts\R2-2207484%20Discussion%20on%20HARQ%20feedback%20disabling.docx) Discussion on HARQ feedback disabling Huawei, HiSilicon discussion Rel-18 IoT\_NTN\_enh

Proposal 1: RAN2 to down select the solutions of disabling HARQ feedback to the SIB solution and the DCI solution.

Proposal 2: RAN2 to further discuss the granularity required for HARQ feedback controlling in IoT NTN before deciding which solution to be adopted.

Proposal 3: An LS should be sent to RAN1 to inform RAN2 conclusion if any.

[R2-2207647](file:///C:\Data\3GPP\Extracts\R2-2207647%20Discussion%20on%20performance%20enhancement%20for%20IoT%20NTN.docx) Discussion on performance enhancement for IoT NTN Transsion Holdings discussion Rel-18

[R2-2207841](file:///C:\Data\3GPP\Extracts\R2-2207841%20Consideration%20on%20HARQ%20and%20GNSS%20enhancements.docx) Consideration on HARQ and GNSS enhancements ZTE Corporation, Sanechips discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2208187](file:///C:\Data\3GPP\Extracts\R2-2208187%20(R18%20IoT-NTN%20WI%20AI%208.6.2)%20-%20disabling%20HARQ%20feedback.docx) Disabling HARQ feedback for IoT-NTN Interdigital, Inc. discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2208388](file:///C:\Data\3GPP\Extracts\R2-2208388%20Discussion%20on%20the%20HARQ%20disabling%20in%20IoT%20NTN.docx) Discussion on the HARQ disabling in IoT NTN CATT discussion Rel-18 IoT\_NTN\_enh

[R2-2208448](file:///C:\Data\3GPP\Extracts\R2-2208448%20Discussion%20on%20the%20performance%20enhancement%20for%20IoT-NTN.docx) Discussion on the performance enhancement for IoT-NTN CMCC discussion Rel-18 IoT\_NTN\_enh

[R2-2208565](file:///C:\Data\3GPP\Extracts\R2-2208565%20Discussion%20on%20HARQ%20feedback%20disabling%20for%20IoT%20NTN.docx) Discussion on HARQ feedback disabling for IoT NTN Nokia, Nokia Shanghai Bell discussion Rel-18 IoT\_NTN\_enh

[R2-2208585](file:///C:\Data\3GPP\Extracts\R2-2208585%20Discussion%20on%20disabling%20of%20HARQ%20feedback.doc) Discussion on disabling of HARQ feedback Xiaomi discussion Rel-18

GNSS operation

[R2-2207075](file:///C:\Data\3GPP\Extracts\R2-2207075%20GNSS%20operation.doc) Discussion on GNSS operation in connected mode OPPO discussion Rel-18 IoT\_NTN\_enh-Core

Proposal 1 UE should go back to IDLE mode if it cannot acquire its GNSS location during connected mode (e.g. before timer expiry or within the gap duration).

- CMCC thinks it’s too early to decide that the UE should go back to idle. Lenovo agrees

- QC/HW/Nokia agree with CMCC

Proposal 2 UE informs network when it finishes GNSS measurement during connected mode. FFS on the signalling details.

Proposal 3 GNSS position fix measurement time is reported in Msg5, e.g. RRCConnectionResumeComplete, RRCConnectionSetupComplete and RRCreestablishmentComplete messages.

- Nokia thinks it’s too early to agree on this. We should first understand the scenarios

- CATT/QC/CMCC agree with Nokia

- ZTE supports p3 but is fine to delay this discussion

Proposal 4 Down-selection between gap-based solution and timer-based solution should consider NB-IoT CP solution where AS security is not activated.

[R2-2207710](file:///C:\Data\3GPP\Extracts\R2-2207710%20Considerations%20on%20reducing%20UE%20GNSS%20operations%20in%20long%20connection%20time.docx) Considerations on reducing UE GNSS operations in long connection time Lenovo discussion Rel-18

Observation 1: UE position can be roughly determined by multiple timing advance values to its serving cell in different time points, without re-acquiring the GNSS.

Observation 2: UE position can be roughly determined by UE propagation delays or differential propagation delays to multiple satellites, without re-acquiring the GNSS.

Proposal 1: RAN2 to consider enhancements to timing advance or propagation delay calculation for position fix purposes, to reduce the need to update GNSS position fix in long connection time.

### 8.6.3 Mobility Enhancements

[R2-2207275](file:///C:\Data\3GPP\Extracts\R2-2207275%20Discussion%20on%20neighbour%20cell%20measurements%20in%20IoT%20NTN.docx) Discussion on neighbour cell measurements in IoT NTN Intel Corporation discussion Rel-18 IoT\_NTN\_enh

Proposal 1: IoT NTN operation can also use the neighbour cell measurements specified in Rel-17 NB-IoT to achieve a fast RRC re-establishment after RLF.

- IDC wonders which parts can be reuse, as the R17 mechanism is based on RSRP.

- Intel thinks we can reuse the mechanism, but agree we can introduce new triggers.

- ZTE thinks that RSRP based triggers should also be supported (up to NW configuration)

- Nokia thinks that fast RRC re-establishment was only for NB-IoT. For eMTC we can use the existing mechanisms in connected mode. Apple agrees.

- Oppo thinks the WID only mentions measurement triggering before RLF, instead of fast re-establishment)

* IoT NTN can use the mechanism for neighbour cell measurements in connected mode (specified in Rel-17 for NB-IoT). FFS if any enhancements are needed (e.g. triggers) for both NB-IoT and eMTC.

Proposal 2: For IoT NTN, network provides the information of next upcoming cells to connected UE, to make UE focus on more likely neighbour cells for RRC re-establishment and save UE power consumption.

[R2-2208449](file:///C:\Data\3GPP\Extracts\R2-2208449%20Discussion%20on%20the%20mobility%20enhancement%20for%20IoT-NTN.docx) Discussion on the mobility enhancement for IoT-NTN CMCC discussion Rel-18 IoT\_NTN\_enh

Proposal 1: RAN2 can introduce new triggering event for triggering RRC Re-establishment to avoid UP interruption due to RLF, such as distance-based triggering event, or before the serving cell is going to stop covering the current area, etc.

- ZTE supports p1. Apple/Lenovo agrees

- Ericsson wonders about the wording.

- QC has some concerns on the use of distance-based mechanisms, as the UE should not be required to update its GNSS position for this.

- Oppo thinks we should not exclude earth-moving cells.

* RAN2 to continue working on a new time-based trigger for triggering intra and inter frequency measurements in connected mode, e.g. the serving cell is going to stop covering the current area, for both earth-moving and earth-fixed cell (FFS on distance-based trigger)

Proposal 2: The satellite assistance information (e.g. ephemeris data and coverage information) can also be considered to configure the triggering event.

Proposal 3: RAN2 to introduce the R17 NR NTN CHO mechanism for eMTC (time/timer based solution and location based solution) with minimum enhancements.

- Oppo wonders what minimum enhancements means

* CHO enhancements for eMTC NTN (i.e. time/timer based solution) are introduced based on the R17 NR NTN solution. FFS on location-based solution

[R2-2207061](file:///C:\Data\3GPP\Extracts\R2-2207061-%20Discussion%20on%20mobility%20enhancement%20for%20IoT%20NTN.doc) Discussion on mobility enhancement for IoT NTN OPPO discussion Rel-18 IoT\_NTN\_enh-Core

Proposal 1 Location based measurement triggering in RRC\_CONNECTED is supported for IoT NTN.

Proposal 2 For quasi-earth fixed cell, distance between UE and serving cell reference location is used to trigger measurement in RRC\_CONNECTED for IoT NTN.

Proposal 3 For earth moving cell, distance between UE and serving satellite is used to trigger measurement in RRC\_CONNECTED for IoT NTN.

Proposal 4 Time based measurement triggering in RRC\_CONNECTED is supported for quasi-earth fixed cell for IoT NTN.

Proposal 5 For quasi-earth fixed cell, UEs in RRC\_CONNETCT should start measurements on neighbour cells before t-Service, regardless of whether location based condition or legacy RSRP based condition is met or not.

Proposal 6 Location-based triggering event and time-based triggering event in NR NTN is re-used in R18 eMTC over NTN.

[R2-2207355](file:///C:\Data\3GPP\Extracts\R2-2207355%20IoT%20mobility.doc) Connected mode mobility enhancements Qualcomm Incorporated discussion Rel-18 IoT\_NTN\_enh-Core

Observation 1. Any location-enhancements in RRC\_CONNECTED mobility enhancements should not require update of GNSS-based UE location.

Proposal 1 Add time-based trigger to start the measurement in RRC\_CONNECTED state.

Proposal 2 Network provides assistance information such as potential cell IDs, satellite ephemeris and common TA parameters for proper CRS/NRS measurement.

Proposal 3 For CHO enhancement, the time-based CHO introduced in NR NTN is baseline and no need to consider location-based CHO as UE will not be updating the GNSS data in RRC\_CONNECTED.

[R2-2207299](file:///C:\Data\3GPP\Extracts\R2-2207299_Mobility%20Enhancements%20in%20IoT-NTN.docx) On Mobility Enhancements in IoT-NTN MediaTek Inc. discussion

Proposal 1: For NB-IoT, support intra and inter frequency measurement in RRC connected mode in Rel-18 NTN.

Proposal 2: The eNB configures the criteria to perform measurements via broadcast signalling.

Proposal 3: Measurement gap is not supported in Rel-18 IoT NTN.

- QC is ok with p3 and p4, suggests to clarify this is for NB-IoT

- ZTE thinks that we might need to further discuss this based on RAN4 discussion.

- Intel would like to restrict this to measurement gap for neighbour cell measurements. NEC agrees with Intel suggestion

Proposal 4: Measurement reporting is not supported in Rel-18 IoT NTN.

- Ericsson wonders if there is an intention to limit this for eMTC NTN as it could be already supported

* Measurement results reporting is not supported in Rel-18 NB-IoT NTN.

Proposal 5: RAN2 to discuss a time-based measurement trigger by connected UE.

Proposal 6: RAN2 will re-use the solutions (e.g., location and time based CHO and associated triggers) introduced in Rel-17 NR NTN as the baseline for mobility enhancements in eMTC-based NTN. Any further enhancements in FFS.

Agreements:

1. IoT NTN can use the mechanism for neighbour cell measurements in connected mode (specified in Rel-17 for NB-IoT). FFS if any enhancements are needed (e.g. triggers) for both NB-IoT and eMTC.
2. RAN2 to continue working on a new time-based trigger for triggering intra and inter frequency measurements in connected mode, e.g. the serving cell is going to stop covering the current area, for both earth-moving and earth-fixed cell (FFS on distance-based trigger)
3. CHO enhancements for eMTC NTN (i.e. time/timer based solution) are introduced based on the R17 NR NTN solution. FFS on location-based solution
4. Measurement results reporting is not supported in Rel-18 NB-IoT NTN.

[R2-2207500](file:///C:\Data\3GPP\Extracts\R2-2207500%20Discussion%20on%20mobility%20enhancements%20for%20IoT%20NTN.DOC) Discussion on mobility enhancements for IoT NTN Huawei, HiSilicon discussion Rel-18 IoT\_NTN\_enh

[R2-2207648](file:///C:\Data\3GPP\Extracts\R2-2207648%20Discussion%20on%20mobility%20enhancement%20for%20IoT%20NTN.docx) Discussion on mobility enhancement for IoT NTN Transsion Holdings discussion Rel-18

[R2-2207682](file:///C:\Data\3GPP\Extracts\R2-2207682.doc) Discussion on triggering neighbour cell measurement before RLF Spreadtrum Communications discussion Rel-18

[R2-2207711](file:///C:\Data\3GPP\Extracts\R2-2207711%20Considerations%20on%20neighbour%20cell%20measurement%20for%20NB-IoT%20in%20NTN%20scenario.docx) Considerations on neighbour cell measurement for NB-IoT in NTN scenario Lenovo discussion Rel-18

[R2-2207842](file:///C:\Data\3GPP\Extracts\R2-2207842%20Consideration%20on%20mobility%20enhancements.docx) Consideration on mobility enhancements ZTE Corporation, Sanechips discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2207913](file:///C:\Data\3GPP\Extracts\R2-2207913%20Discussion%20on%20mobility%20enhancements%20for%20IoT%20NTN.doc) Discussion on mobility enhancements to IoT NTN Xiaomi discussion

[R2-2207931](file:///C:\Data\3GPP\Extracts\R2-2207931.docx) Mobility Enhancement for IoT NTN Samsung R&D Institute UK discussion

[R2-2207939](file:///C:\Data\3GPP\Extracts\R2-2207939_RLF%20in%20IoT%20NTN.doc) Neighbour cell measurements before RLF Apple discussion Rel-18 IoT\_NTN\_enh

[R2-2208037](file:///C:\Data\3GPP\Extracts\R2-2208037-Mobility-Enhancements-IoT-NTN.docx) Changes to current mobility enhancement procedures for IoT-NTN Nokia, Nokia Shanghai Bell discussion Rel-18

[R2-2208146](file:///C:\Data\3GPP\Extracts\R2-2208146.docx) Discussion on Mobility Enhancements TURKCELL discussion Rel-18

[R2-2208188](file:///C:\Data\3GPP\Extracts\R2-2208188%20(R18%20IoT-NTN%20WI%20AI%208.6.3)%20-%20mobility%20enhancements.docx) IoT-NTN mobility enhancements Interdigital, Inc. discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2208389](file:///C:\Data\3GPP\Extracts\R2-2208389%20Discussion%20on%20the%20mobility%20enhancements%20in%20eMTC.docx) Discussion on the mobility enhancements in eMTC CATT discussion Rel-18 IoT\_NTN\_enh

[R2-2208518](file:///C:\Data\3GPP\Extracts\R2-2208518.docx) Use of Elevation Angle Threshold for IoT NTN Neighbour Cell Measurements SHARP Corporation discussion Rel-18

[R2-2208673](file:///C:\Data\3GPP\Extracts\R2-2208673%20-%20R18%20IoT%20NTN%20Mobility%20enhancements.docx) R18 IoT NTN Mobility enhancements Ericsson discussion

### 8.6.4 Enhancements to discontinuous coverage

[R2-2207301](file:///C:\Data\3GPP\Extracts\R2-2207301_Enhancements%20to%20discontinuous%20coverage%20in%20IoT-NTN.docx) Enhancements to discontinuous coverage in IoT-NTN MediaTek Inc. discussion

[R2-2207356](file:///C:\Data\3GPP\Extracts\R2-2207356%20DC%20enhancement.doc) RRC release procedure in discontinuous coverage Qualcomm Incorporated discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2207483](file:///C:\Data\3GPP\Extracts\R2-2207483%20Discussion%20on%20the%20discontinuous%20coverage.doc) Discussion on the discontinuous coverage Huawei, HiSilicon discussion Rel-18 IoT\_NTN\_enh

[R2-2207649](file:///C:\Data\3GPP\Extracts\R2-2207649%20Discussion%20on%20enhancement%20to%20discontinuous%20coverage%20for%20IoT%20NTN.docx) Discussion on enhancement to discontinuous coverage for IoT NTN Transsion Holdings discussion Rel-18

[R2-2207683](file:///C:\Data\3GPP\Extracts\R2-2207683.doc) Discussion on power saving mechanism for supporting discontinuous coverage Spreadtrum Communications discussion Rel-18

[R2-2207712](file:///C:\Data\3GPP\Extracts\R2-2207712%20Considerations%20on%20mobility%20management%20and%20power%20saving%20for%20discontinuous%20coverage.docx) Considerations on mobility management and power saving for discontinuous coverage Lenovo discussion Rel-18

[R2-2207778](file:///C:\Data\3GPP\Extracts\R2-2207778%20Power%20Saving%20Enhancement%20for%20Discontinuous%20Coverage.docx) Power Saving Enhancement for Discontinuous Coverage Google Inc. discussion Rel-18

[R2-2207843](file:///C:\Data\3GPP\Extracts\R2-2207843%20Consideration%20on%20discontinuous%20coverage%20enhancements.docx) Consideration on discontinuous coverage enhancements ZTE Corporation, Sanechips discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2207914](file:///C:\Data\3GPP\Extracts\R2-2207914%20Discussion%20on%20enhancements%20to%20discontinuous%20coverage.doc) Discussion on enhancements to discontinuous coverage Xiaomi discussion

[R2-2208023](file:///C:\Data\3GPP\Extracts\R2-2208023.docx) Enhancements to discontinuous coverage Samsung R&D Institute UK discussion

[R2-2208115](file:///C:\Data\3GPP\Extracts\R2-2208115.docx) Power Saving Enhancement for Discontinuous Coverage Samsung R&D Institute UK discussion

[R2-2208189](file:///C:\Data\3GPP\Extracts\R2-2208189%20(R18%20IoT-NTN%20WI%20AI%208.6.4)%20-%20discontinuous%20coverage.docx) IoT-NTN discontinuous coverage enhancements Interdigital, Inc. discussion Rel-18 IoT\_NTN\_enh-Core

[R2-2208450](file:///C:\Data\3GPP\Extracts\R2-2208450%20Discussion%20on%20the%20discontinuous%20coverage%20for%20IoT-NTN.docx) Discussion on the discontinuous coverage for IoT-NTN CMCC discussion Rel-18 IoT\_NTN\_enh

[R2-2208566](file:///C:\Data\3GPP\Extracts\R2-2208566%20Discussion%20on%20discontinuous%20coverage%20for%20IoT%20NTN.docx) Discussion on Discontinuous Coverage for IoT NTN Nokia, Nokia Shanghai Bell discussion Rel-18 IoT\_NTN\_enh

[R2-2208663](file:///C:\Data\3GPP\RAN2\Docs\R2-2208663.zip) Discussion on Enhancements related to discontinuous coverage Rakuten Mobile, Inc discussion Rel-18 [R2-2201620](file:///C:\Data\3GPP\archive\RAN2\RAN2%23116bis\Tdocs\R2-2201620.zip)

[R2-2208672](file:///C:\Data\3GPP\Extracts\R2-2208672%20-%20R18%20IoT%20NTN%20Enhancements%20to%20discontinuous%20coverage.docx) R18 IoT NTN Enhancements to discontinuous coverage Ericsson discussion

## 8.7 NR NTN enhancements

(xx-Core; leading WG: RAN1; REL-18; WID: RP-221819)

Time budget: 1 TU

Tdoc Limitation: 3 tdocs

### 8.7.1 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.

[R2-2207096](file:///C:\Data\3GPP\Extracts\R2-2207096%20-%20R18%20WI%20NR-NTN-enh%20workplan.docx) R18 WI NR-NTN-enh work plan at RAN1, 2 and 3 THALES Work Plan Rel-18 NR\_NTN\_enh

- QC thinks that for Coverage Enhancements RAN2 can work also independently on what RAN1 is doing

### 8.7.2 Coverage Enhancements

[R2-2207346](file:///C:\Data\3GPP\Extracts\R2-2207346%20protocol%20overhead%20reduction.doc) Protocol overhead reduction for coverage enhancements Qualcomm Incorporated discussion Rel-18 NR\_NTN\_enh-Core

Proposal 1 To reduce protocol overhead, define RAN trigger mechanism for the voice frame aggregation (i.e., 2 voice frames per packet) in NGSO.

- HW is not sure this applies for coverage enhancements and are not sure how we can do this in RAN. Samsung agrees with HW

- Nokia agrees with QC. Also think we can consider aggregation at RAN level, with no need to discuss interactions with other layers. QC is ok to study both (application layer and RAN layer)

- vivo thinks this is also related to grant size and then RAN1 work

- Oppo thinks we should limit the solution to what we can handle in RAN

Proposal 2 RAN2 work on solutions to minimize the size of headers for MAC, RLC, PDCP and ROHC to improve the coverage gain for low SNR UEs in NTN.

- HW thinks we cannot agree on this now before considering all the solutions. Also don’t think we can change ROHC header. Nokia agrees that it’s difficult to change ROHC header

- QC thinks the ROHC header change is between UE and RAN so not related to other entity or to the application layer

[R2-2208612](file:///C:\Data\3GPP\Extracts\R2-2208612%20Discussion%20on%20RAN%20protocol%20overhead%20reduction.doc) Discussion on RAN protocol overhead reduction Huawei, HiSilicon discussion Rel-18 NR\_NTN\_enh

Observations:

Observation 1: The motivation of L2 protocol overhead reduction for VoNR also exists in the TN scenario.

Observation 2: In NTN, the UL/DL SDAP header can already be absent via appropriate configuration according to the current specification.

Observation 3: In NTN, the D/C field, PDCP SN field and MAC-I field in PDCP header are needed for VoNR.

Observation 4: If RLC TM mode is allowed to be applied to VoNR, RLC header can be saved but it is hard for gNB to allocate suitable UL grant for the UE.

Observation 5: If the UM mode is used in NTN, the SI field, SN field and SO field in RLC header are needed for VoNR.

Observation 6: If the AM mode is used in NTN, the D/C, SI and SN fields in RLC header are needed for VoNR.

Observation 7: The F, LCID and L fields in MAC header are needed for VoNR.

Proposals:

Proposal: RAN2 to evaluate the following two aspects of reducing RAN protocol overhead for VoNR in the 6-month study phase:

1) Whether L2 protocol overhead for VoNR is an NTN-specific issue to solve in R18 NTN.

2) Which of the L2 headers can actually be saved and how much potential gain can be obtained by this way.

- Intel agrees with HW that if something is not NR NTN specific it should be handled elsewhere in another WI or Rel-18 TEI. This is part of the WID

- QC thinks we need enhancements for NTN and we need to work on that. But if an enhancement is applicable also for other cases (like TN networks) we can still consider it

- Oppo, CATT agree with HW

- Thales thinks we should be open on this. Verizon agrees.

- Mediatek thinks the WID says that only NTN characteristics should be considered.

* RAN2 understands that, based on the WID, only solutions that address the NTN specific characteristics (e.g. related to propagation delays, coverage loss, satellite movement) should be considered. But the identified solutions could then also be applicable to other cases (TN networks). In any case this will be discussed case by case (this understanding is not meant to change the WID description)

- QC highlights that the WID also indicates protocol overhead reduction as part of the scope

Agreements:

1. RAN2 understands that, based on the WID, only solutions that address the NTN specific characteristics (e.g. related to propagation delays, coverage loss, satellite movement) should be considered. But the identified solutions could then also be applicable to other cases (TN networks). In any case this will be discussed case by case (this understanding is not meant to change the WID description)

[R2-2208567](file:///C:\Data\3GPP\Extracts\R2-2208567%20On%20coverage%20enhancement%20for%20NR%20NTN.docx) On Coverage Enhancements for NR NTN Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_NTN\_enh

[R2-2207633](file:///C:\Data\3GPP\Extracts\R2-2207633%20Discussion%20on%20RAN%20overhead%20reduction%20for%20VoNR%20support%20in%20NR%20NTN.docx) Discussion on RAN overhead reduction for VoNR support in NR NTN vivo discussion

[R2-2207713](file:///C:\Data\3GPP\Extracts\R2-2207713%20Potential%20issues%20for%20Msg3%20repetition%20in%20NTN.docx) Potential issues for Msg3 repetition in NTN Lenovo discussion Rel-18

[R2-2208276](file:///C:\Data\3GPP\Extracts\R2-2208276%20(R18%20NTN%20WI%20AI%208.7.2)%20Msg3%20blind%20retx.docx) Blind Msg3 retransmission in Rel-18 NTN InterDigital discussion Rel-18 NR\_NTN\_enh-Core

[R2-2208323](file:///C:\Data\3GPP\Extracts\R2-2208323_Discussion%20on%20the%20coverage%20enhancement%20in%20NTN_r1.docx) Discussion on the coverage enhancement in NTN LG Electronics Inc. discussion NR\_NTN\_enh-Core

[R2-2208375](file:///C:\Data\3GPP\Extracts\R2-2208375%20Analysis%20on%20NTN%20coverage%20enhancement.docx) Analysis on NTN Coverage Enhancement CATT discussion Rel-18 NR\_NTN\_enh

[R2-2208586](file:///C:\Data\3GPP\Extracts\R2-2208586%20Discussion%20on%20coverage%20enhancement%20for%20NR%20NTN.doc) Discussion on coverage enhancement for NR NTN Xiaomi discussion Rel-18

### 8.7.3 Network verified UE location

[R2-2207098](file:///C:\Data\3GPP\Extracts\R2-2207098%20Network%20verified%20UE%20location%20aspects.docx) Network verified UE location aspects THALES discussion Rel-18 NR\_NTN\_enh

Observation 1: Regulatory requirements can be addressed by determining the location of the UE.

Observation 2: The UE reported location information cannot be considered trusted by the network.

Observation 3: A 5G system with satellite access shall be able to determine a UE's location in order to provide service (e.g. route traffic, public warning system, lawful interception, emergency services,…)

Proposal 1: UE assisted and NG-RAN node assisted methods should only be considered as part of Network verified UE location study in RAN2

- Oppo thinks p1 intends to say that we only consider UE assisted and NG-RAN node assisted methods. VC/Mediatek think that “only” should be at the beginning

- Intel thinks we can remove UE assisted, as UE-assisted methods cannot be trusted.

- Thales does not think that all the information coming from the UE cannot be trusted, and then UE-assisted methods can be considered

Proposal 2: The methods listed in [3GPP TS 38.305] that can be candidate for network verified UE location based on 5G NR signals, based on network computations and potentially assisted by UE measurements are as follows: Multi-RTT, NT E-CID, UL-TDOA and UL-AoA.

Method UE assisted NG-RAN node assisted

Multi-RTT Yes Yes

NR E-CID Yes Yes

UL-TDOA No Yes

UL-AoA No Yes

- Oppo thinks also DL based methods should be considered

- Ericsson thinks multi-RTT would require very long time and then is not very useful

- QC thinks RAN1 is working on this and we need RAN1 feedback. AoA should be discussed in RAN1. UL and DL TDOA could also be considered.

- Thales thinks that also a combination of methods could be considered

- Mediatek agrees with QC that RAN1 is discussing all these and we need to identify RAN2 scope. QC agrees

* Continue during Tuesday GTW session

Proposal 3: The impact of the multi-RTT computation on delay of the targeted services (e.g. route traffic, public warning system, lawful interception, emergency services,…) must be further studied

Proposal 4: These multi-RTT measurements may be event triggered, after a given procedure such as RACH or network triggered based on a command received from the network.

Proposal 5: For NGSO constellations with Quasi earth fixed or Earth moving cells, the Multi-RTT solution is applicable.

Proposal 6: The multi-RTT solution needs to be further investigated. RAN2 should send an LS to RAN1 about the performance of the multi-RTT techniques in a single satellite context (precision in the measurements, spacing on the measures,…).

Proposal 7: Wait for RAN1 outcomes on the performances in order to investigate further the multi-RTT solution at RAN2 level

Observation 6: For the GEO case with Earth fixed cells, where several measurements at different positions are not possible, a mono-RTT approach can be adopted instead. The principle is the same as in the multi-RTT case, however only one measurement is performed

Observation 7: With the mono-RTT approach, the network is not able to compute autonomously the position of the UE, however it will be able to verify, or corroborate the position reported by the UE with the measure performed.

Proposal 8: a mono-RTT approach can be adopted for the GEO satellite case

Proposal 9: Timing Advance (TA) value as applied by the UE (on the service link) in order to align the UL/DL subframe at the gNB air interface can be reported through a RRC message along with the frame/subframe number associated to TA value.

Proposal 10: The precision of the Timing Advance (TA) reported value (as applied by the UE on the service link) needs to be further investigated. RAN2 should send an LS to RAN1 about the performance of the technique in a single satellite context.

Proposal 11: Wait for RAN1 outcomes on the performances in order to investigate further the positioning method based on the Timing Advance (TA) value reporting (as applied by the UE on the service link) at RAN2 level

[R2-2208775](file:///C:\Data\3GPP\RAN2\Inbox\R2-2208775.zip) Network verified UE location aspects THALES discussion Rel-18 NR\_NTN\_enh

Proposal 0-1: The UE location information is considered verified if the reported GNSS position is consistent with the network based assessment to within 5-10 km (similar to terrestrial network macro cell size).

- QC/Nokia thinks this is part of the WID.

* The UE location information is considered verified if the reported GNSS position is consistent with the network based assessment to within 5-10 km (similar to terrestrial network macro cell size) (it is assumed that there is no RAN2 spec impact due to this)

Proposal 0-2: Given that the Network may determine multiple possible UE locations due to error/geometrical ambiguities, the reported GNSS position should be consistent with at least one of the multiple possible UE location.

Proposal 0-3: The consistency may be based on a distance threshold (e.g. < 10 km) or a verification area as per implementation

Proposal 0-4: RAN2 should consider, as starting point, the re-use of the LCS framework of the LMF network for the network verification procedure.

- QC agrees

- HW also agrees, as it comes from the TR. Oppo/Intel/MTK/Samsung agree

- Samsung suggests to send and LS on this.

- CMCC/Lenovo think that other RAN-based options should not be precluded

* RAN2 should consider, as starting point, the re-use of the LCS framework of the LMF network for the network verification procedure. Send an LS to SA2 indicating RAN2 assumption on this
* Continue the discussion on this LS in offline 120

Proposal 1: UE assisted and ~~NG-RAN node~~ network assisted methods ~~should only~~ can be considered as part of Network verified UE location study in RAN2 on the basis that UE reported information as part of 3GPP defined functions can be trusted if not derived exclusively from information provided by non 3GPP defined function.

- Intel wonders why we need to exclude UE based solution (e.g. DL TDOA) if we reuse 3GPP defined functions. Thales think that p1 reflects the RAN plenary discussion

Proposal 2: The network verification of the UE reported location may combine one or several 3GPP defined RAT dependent positioning methods (e.g. Multi RTT, DL/UL-TDOA, DL-AoA, NR E-CID, etc.).

* Agreed

Proposal  3: The network verification procedure should not impact significantly the latency ~~impact of the multi-RTT computation on delay~~ of the targeted regulated services (e.g. public warning system, lawful interception, emergency services, charging…) ~~must be further studied~~.

- QC/Lenovo are fine

- Nokia wonders what “significantly” means

- Ericsson wonders why we need to list these services specifically. Ericsson thinks that verification can be done in the CN without the RAN knowing what happens

Proposal  4: The network verification procedure ~~These multi-RTT measurements~~ may be ~~event triggered, after a given procedure such as RACH or~~ network triggered based on a command received from the network (AMF) or event triggered, after a given procedure such as RACH.

~~Proposal 5: For NGSO constellations with Quasi earth fixed or Earth moving cells, the Multi-RTT solution is applicable.~~

~~Proposal 6: The multi-RTT solution needs to be further investigated. RAN2 should send an LS to RAN1 about the performance of the multi-RTT techniques in a single satellite context (precision in the measurements, spacing on the measures,…).~~

Proposal 7: Wait for RAN1 outcomes on the performances in order to investigate further the multi-RTT solution at RAN2 level

Proposal 8: a mono-RTT approach can be adopted for the GEO satellite case

Proposal 9: Timing Advance (TA) value as applied by the UE (on the service link) in order to align the UL/DL subframe at the gNB air interface can be reported through a RRC message along with the frame/subframe number associated to TA value.

Proposal 10: The precision of the Timing Advance (TA) reported value (as applied by the UE on the service link) needs to be further investigated. RAN2 should send an LS to RAN1 about the performance of the technique in a single satellite context.

Proposal 11: Wait for RAN1 outcomes on the performances in order to investigate further the positioning method based on the Timing Advance (TA) value reporting (as applied by the UE on the service link) at RAN2 level

Agreements:

1. The UE location information is considered verified if the reported GNSS position is consistent with the network based assessment to within 5-10 km (similar to terrestrial network macro cell size) (it is assumed that there is no RAN2 spec impact due to this)
2. RAN2 should consider, as starting point, the re-use of the LCS framework of the LMF network for the network verification procedure. Send an LS to SA2 indicating RAN2 assumption on this
3. The network verification of the UE reported location may combine one or several 3GPP defined RAT dependent positioning methods (e.g. Multi RTT, DL/UL-TDOA, DL-AoA, NR E-CID, etc.).

* [AT119-e][120][NR-NTN] LS to SA2 (Thales)

Scope: Draft LS to SA2 to inform of the RAN2 assumption on re-use of the LCS framework for the network verification procedure

Intended outcome: LS to SA2

Deadline (for companies' feedback): Thursday 2022-08-25 1800 UTC

Deadline (for final LS in R2-2208779): Friday 2022-08-26 1000 UTC

[R2-2207634](file:///C:\Data\3GPP\Extracts\R2-2207634%20Discussion%20on%20NW%20verification%20of%20UE%20location%20in%20Rel-18%20NR%20NTN.docx) Discussion on NW verification of UE location in Rel-18 NR NTN vivo discussion

Observation 1: NW verification of UE location has already been supported in the existing Specs for Rel-17 NR NTN based on the legacy LCS framework. Specifically, the NW (i.e. AMF) is already able to initiate LCS procedure as specified in TS 23.501 and TS 23.273, and then rely on the existing POS mechanisms specified in NG-RAN to verify the UE location, once Rel-17 NTN is deployed with the LMF.

Observation 2: RAN work on this NW verification of UE location should mainly focus on the potential enhancements of POS method in NG-RAN which mainly falls into RAN1 expertise.

Proposal 1: For the scope of UE location verification, RAN2 confirms which of the following WFs to go by taking into account their pros and cons:

WF1: Enhance existing positioning method(s) in NG-RAN (TS 38.305) on top of the verification mechanism based on the LCS framework (already supported in R17 NTN);

WF2: introduce RAN-based verification methods, which can be supported independently by RAN (w/o dependency on legacy LCS framework).

Proposal 2: Send LS to RAN1, informing RAN1 of the RAN2 conclusion on which WF to adopt, and asking RAN1 to carry out the study on the enhancements to POS methods in NG-RAN that are needed for this NTN-specific NW verification purpose (e.g. RS type, measurement to report, TRP aspects, etc.).

[R2-2208022](file:///C:\Data\3GPP\Extracts\R2-2208022.docx) UE location verification in NTN Deutsche Telekom, Huawei, HiSilicon discussion Rel-18 NR\_NTN\_enh-Core

Proposal 1: RAN2 to investigate whether and how the NTN network can instruct the UE to report reference TN PLMN identities for UE location verification.

Proposal 2: RAN2 to take this solution into consideration when evaluating the need for Network verified UE location specification support in Rel-18.

[R2-2207074](file:///C:\Data\3GPP\Extracts\R2-2207074%20NW%20verified%20UE%20location.doc) Discussion on network verified UE location OPPO discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207274](file:///C:\Data\3GPP\Extracts\R2-2207274%20Discussion%20on%20network%20verified%20UE%20location.docx) Discussion on network verified UE location Intel Corporation discussion Rel-18 NR\_NTN\_enh

[R2-2207296](file:///C:\Data\3GPP\Extracts\R2-2207296_Assumptions%20on%20Network%20verified%20location.docx) Assumptions on Network verified location NEC Telecom MODUS Ltd. discussion

[R2-2207302](file:///C:\Data\3GPP\Extracts\R2-2207302-Network%20verification%20of%20UE%20location.docx) On Network Verified UE Location in NR-NTN MediaTek Inc. discussion

[R2-2207326](file:///C:\Data\3GPP\Extracts\R2-2207326%20Considerations%20on%20NW-verified%20UE%20location.docx) Considerations on NW-verified UE location Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207444](file:///C:\Data\3GPP\Extracts\R2-2207444_Consideration%20on%20NTN%20Network%20Verified%20UE%20Location_v0.doc) Consideration on NTN Network Verified UE Location Apple discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207482](file:///C:\Data\3GPP\Extracts\R2-2207482%20Discussion%20on%20the%20network%20verified%20UE%20location.doc) Discussion on the network verfied UE location Huawei, HiSilicon discussion Rel-18 NR\_NTN\_enh

[R2-2207645](file:///C:\Data\3GPP\Extracts\R2-2207645%20Discussion%20of%20Network%20verified%20UE%20location%20in%20NTN.doc) Discussion of Network verified UE location in NTN China Telecom discussion Rel-18

[R2-2207675](file:///C:\Data\3GPP\Extracts\R2-2207675%20Discussion%20on%20UE%20location%20verify%20procedure.doc) Discussion on UE location verify procedure Spreadtrum Communications discussion Rel-18

[R2-2207779](file:///C:\Data\3GPP\Extracts\R2-2207779.docx) Network Verified UE Location Samsung R&D Institute UK discussion

[R2-2207866](file:///C:\Data\3GPP\Extracts\R2-2207866_NTN_NW_Verified_Loc_Lenovo.docx) On NTN NW verified UE location aspects Lenovo discussion Rel-18

[R2-2207915](file:///C:\Data\3GPP\Extracts\R2-2207915%20Discussion%20on%20network%20verified%20UE%20location%20.doc) Discussion on network verified UE location Xiaomi discussion

[R2-2208328](file:///C:\Data\3GPP\Extracts\R2-2208328%20Discussion%20on%20Network%20Verified%20UE%20Location.docx) Discussion on Network Verified UE Location NTT DOCOMO INC. discussion Rel-18

[R2-2208376](file:///C:\Data\3GPP\Extracts\R2-2208376%20Discussion%20on%20UE%20Location%20Verification.docx) Discussion on UE Location Verification CATT discussion Rel-18 NR\_NTN\_enh

[R2-2208444](file:///C:\Data\3GPP\Extracts\R2-2208444%20Consideration%20on%20UE%20Location%20Verification%20via%20Network.doc) Consideration on UE Location Verification via Network CMCC discussion Rel-18 NR\_NTN\_enh-Core

[R2-2208546](file:///C:\Data\3GPP\Extracts\R2-2208546%20Consideration%20on%20NW%20verified%20UE%20location.doc) Consideration on NW verified UE location ZTE Corporation, Sanechips discussion Rel-18

[R2-2208674](file:///C:\Data\3GPP\Extracts\R2-2208674%20-%20R18%20NR%20NTN%20Network%20verified%20UE%20location.docx) R18 NR NTN Network verified UE location Ericsson discussion

* [POST119-e][1xx][NR-NTN] NW verified UE location (Thales)

Scope: discuss the main principles of the verification procedure (e.g. criteria, performance) and identify potential solutions considering proposals in contributions submitted to RAN2#119-e

Intended outcome: email discussion summary

Deadline: Long

### 8.7.4 NTN-TN and NTN-NTN mobility and service continuity enhancements

Cell reselection aspects

[R2-2207327](file:///C:\Data\3GPP\Extracts\R2-2207327%20On%20NTN-NTN%20and%20TN-NTN%20mobility%20in%20Rel-18.docx) On NTN-NTN and TN-NTN mobility in Rel-18 Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_NTN\_enh-Core

Observation 1: In NTN-TN coexistence there is a large diversity due to different use cases, operators, frequencies, UE types (VSAT/handheld), etc.

Proposal 1: RAN2 is asked to study what kind of assistance information can be provided to NTN UEs so that measurements for TN’s coverage are performed only when relevant.

- Oppo/IDC support this

* RAN2 to work on a solution so that measurements for TN’s coverage are performed only when relevant (FFS what relevant means).
* RAN2 to work on assistance information that can be provided to NTN UEs for the above.

Proposal 2: The study considers Earth-moving and quasi-Earth-fixed scenarios and assumes the use of system information for broadcasting necessary parameters.

- QC wonders whether dedicated signalling is prevented by this.

- Nokia thinks that broadcast information is needed for cell reselection but we can also consider dedicated signalling

- NEC wonders if this applies to GSO

* Cell reselection enhancements (for both NTN-NTN and NTN-TN mobility) are considered for both Earth-moving and (quasi-)Earth-fixed scenarios, at least via the use of system information for broadcasting necessary parameters (dedicated signalling is not precluded). FFS whether the same or different solutions are used for Earth-moving and (quasi-)Earth-fixed scenarios

Observation 2: Rel-17 introduces distanceThresh and t-Service which can be used by the UEs in quasi-Earth fixed cell to perform cell reselection measurements.

Observation 3: using distance threshold or t-Service for cell reselections in Earth-moving NTN scenario is more complex than in quasi-Earth fixed NTN case.

Proposal 3: UE performs individual estimation, considering satellite’s ephemeris, cell reference location and its own location to enable location-based reselections in Earth-moving scenario.

Proposal 4: To enable time-based reselections in Earth-moving scenario, the IDLE UE is capable of computing its own location to adjust t-Service provided in SIB19.

Agreements:

1. RAN2 to work on a solution so that measurements for TN’s coverage are performed only when relevant (FFS what relevant means).
2. RAN2 to work on assistance information that can be provided to NTN UEs for the above.
3. Cell reselection enhancements (for both NTN-NTN and NTN-TN mobility) are considered for both Earth-moving and (quasi-)Earth-fixed scenarios, at least via the use of system information for broadcasting necessary parameters (dedicated signalling is not precluded). FFS whether the same or different solutions are used for Earth-moving and (quasi-)Earth-fixed scenarios

[R2-2207245](file:///C:\Data\3GPP\Extracts\R2-2207245%208.7.4%20cell%20reselection%20enhancement_v3.docx) NTN cell reselection enhancements Samsung Research America discussion Rel-18

Observation 1: Distance-based cell ranking in cell reselection needs to be introduced to compensate legacy cell reselection criterion and to align with RRC connected UE mobility.

Proposal 1: RAN2 to resume discussion on distance-based cell ranking for idle/inactive UE cell reselection.

Observation 2: NW has knowledge of the incoming cell(s) that will replace the current serving cell to serve the area after t-Service and the incoming cell information can bring UE power saving in measurement.

Proposal 2: NW provides the incoming cell information associated with the t-Service.

Observation 3: The UE most likely needs to measure all TN cells with all physical cell id ranges due to large NTN cell coverage to the legacy whitelist.

Proposal 3: NW provides TN cell information according to the location within a NTN cell.

Observation 4: Relax measurement for cell reselection is applicable to NTN UE.

Proposal 4: NTN-specific relaxed measurement rule/criteria needs to be specified.

Observation 5: UE needs assistance information of earth-moving cells for cell reselection measurement.

Proposal 5: NW provides time-based assistance information of earth-moving cells for cell reselection measurement.

Proposal 6: NW provides location-based assistance information of earth-moving cells for cell reselection measurement.

HO enhancements

[R2-2207073](file:///C:\Data\3GPP\Extracts\R2-2207073%20NTN%20connected%20mode%20mobility.doc) Discussion on NTN handover enhancements OPPO discussion Rel-18 NR\_NTN\_enh-Core

Proposal 1 To solve the signaling burst issue, RAN2 consider the design of including only the target cell ID/index in the handover command. The target cell’s configuration can be acquired through the pre-configured CHO configuration. FFS on the signaling options, e.g. MAC CE or RRC message.

Proposal 2 To reduce handover signalling overhead, some information in the handover command, e.g. t304 and spCellConfigCommon, that can be common to all UEs can be delivered to UEs in a broadcast manner.

Proposal 3 Support RACH-less handover in Rel-18 NR NTN.

[R2-2207347](file:///C:\Data\3GPP\Extracts\R2-2207347%20Mobility%20enhancements.doc) Signaling and congestion reduction in satellite switch Qualcomm Incorporated discussion Rel-18 NR\_NTN\_enh-Core

Proposal 1 RAN2 work on group handover and RACH-less handover to mitigate the signaling overhead in source and target cells.

- HW thinks that group HO was considered in the study phase but not further pursued at the end. Also RACH-less HO is not supported in NR NTN

- QC thinks there is a cleat benefit from both group HO and RACH-less HO

- LGE, vivo, Intel have some concerns with RACH-less

* Continue on this in the next meeting

[R2-2207022](file:///C:\Data\3GPP\Extracts\R2-2207022_NTN_mobility.docx) Discussion on assistance information of cell reselection for NTN-TN mobility ITRI discussion NR\_NTN\_enh

[R2-2207048](file:///C:\Data\3GPP\Extracts\R2-2207048%20Discussion%20on%20mobility%20enhancements%20in%20Rel-18%20NTN.docx) Discussion on mobility enhancements in Rel-18 NTN New H3C Technologies Co., Ltd. discussion NR\_NTN\_enh

[R2-2207062](file:///C:\Data\3GPP\Extracts\R2-2207062%20Discussion%20on%20mobility%20enhancements%20for%20idle%20and%20inactive%20UEs.doc) Discussion on mobility enhancements for idle and inactive UEs OPPO discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207195](file:///C:\Data\3GPP\Extracts\R2-2207195_Discussion%20on%20NTN-TN%20and%20NTN-NTN%20mobility.doc) Discussion on NTN-TN and NTN-NTN mobility NTT DOCOMO, INC. discussion Rel-18

[R2-2207244](file:///C:\Data\3GPP\Extracts\R2-2207244%208.7.4%20NTN%20connected%20MobEnh_v2.docx) NTN mobility enhancements in connected mode Samsung Research America discussion Rel-18

[R2-2207272](file:///C:\Data\3GPP\Extracts\R2-2207272%20Discussion%20on%20NTN%20handover%20enhancements.docx) Discussion on NTN handover enhancements Intel Corporation discussion Rel-18 NR\_NTN\_enh

[R2-2207273](file:///C:\Data\3GPP\Extracts\R2-2207273%20Discussion%20on%20NTN%20cell%20reselection%20enhancements.docx) Discussion on NTN cell reselection enhancements Intel Corporation discussion Rel-18 NR\_NTN\_enh

[R2-2207297](file:///C:\Data\3GPP\Extracts\R2-2207297_NTN-NTN%20handover%20enhancement%20for%20RRC_CONNECTED%20UEs.docx) NTN-NTN handover enhancement for RRC\_CONNECTED UEs NEC Telecom MODUS Ltd. discussion

[R2-2207298](file:///C:\Data\3GPP\Extracts\R2-2207298_Solutions%20to%20reduce%20UE%20power%20consumption%20for%20NTN%20to%20TN%20mobility%20in%20Idle%20or%20Inactive%20mode.docx) Solutions to reduce UE power consumption for NTN to TN mobility in Idle or Inactive mode NEC Telecom MODUS Ltd. discussion

[R2-2207303](file:///C:\Data\3GPP\Extracts\R2-2207303_Improving%20Cell%20Reseelction%20using%20Next%20Cell%20Information%20in%20NTN.docx) Improving Cell Reselection in NR-NTN MediaTek Inc. discussion

[R2-2207304](file:///C:\Data\3GPP\Extracts\R2-2207304_HO%20enhancement%20in%20LEO-NTN%20with%20Earth-moving%20Cells.docx) Handover Enhancement in LEO NTN with Earth-moving Cells MediaTek Inc. discussion

[R2-2207348](file:///C:\Data\3GPP\Extracts\R2-2207348%20IDLE%20mode%20enhancements.doc) IDLE mode TN-NTN mobility enhancement Qualcomm Incorporated discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207445](file:///C:\Data\3GPP\Extracts\R2-2207445_%20NTN-NTN%20Mobility%20Enhancement_v0.doc) NTN-NTN Mobility Enhancement Apple discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207446](file:///C:\Data\3GPP\Extracts\R2-2207446_%20NTN-TN%20Mobility%20Enhancement_v0.doc) NTN-TN Mobility Enhancement Apple discussion Rel-18 NR\_NTN\_enh-Core

[R2-2207499](file:///C:\Data\3GPP\Extracts\R2-2207499%20Discussion%20on%20NTN%20mobility%20enhancements.doc) Discussion on NTN mobility enhancements Huawei, HiSilicon discussion Rel-18 NR\_NTN\_enh

[R2-2207635](file:///C:\Data\3GPP\Extracts\R2-2207635%20Discussion%20on%20mobility%20and%20service%20continuity%20enhancement.docx) Discussion on mobility and service continuity enhancement vivo discussion

[R2-2207646](file:///C:\Data\3GPP\Extracts\R2-2207646%20Discussion%20of%20NTN-TN%20mobility.doc) Discussion of NTN-TN mobility China Telecom discussion Rel-18

[R2-2207650](file:///C:\Data\3GPP\Extracts\R2-2207650%20Discussion%20on%20NTN%20mobility%20and%20service%20continuity%20enhancements.doc) Discussion on NTN mobility and service continuity enhancements Transsion Holdings discussion Rel-18

[R2-2207676](file:///C:\Data\3GPP\Extracts\R2-2207676%20Some%20enhancements%20in%20NTN%20handover.doc) Some enhancements in NTN Handover Spreadtrum Communications discussion Rel-18

[R2-2207714](file:///C:\Data\3GPP\Extracts\R2-2207714%20Issue%20analysis%20for%20service%20continuity%20in%20TN-NTN%20and%20NTN-NTN%20scenarios.docx) Issue analysis for service continuity in TN-NTN and NTN-NTN scenarios Lenovo discussion Rel-18

[R2-2207767](file:///C:\Data\3GPP\Extracts\R2-2207767.docx) Discussion on NTN-TN mobility and NTN-NTN mobility ITL discussion Rel-18

[R2-2207834](file:///C:\Data\3GPP\Extracts\R2-2207834.docx) NTN-TN mobility enhancements Sony discussion Rel-18 NR\_NTN\_enh

[R2-2207835](file:///C:\Data\3GPP\Extracts\R2-2207835.docx) Signaling overhead reduction during NTN-NTN HOs Sony discussion Rel-18 NR\_NTN\_enh

[R2-2207894](file:///C:\Data\3GPP\RAN2\Docs\R2-2207894.zip) Network-driven NTN-NTN Mobility Considerations Lockheed Martin discussion Late

[R2-2207916](file:///C:\Data\3GPP\Extracts\R2-2207916%20Discussion%20on%20mobility%20and%20service%20continuity%20enhancements.doc) Discussion on mobility and service continuity enhancements Xiaomi discussion

[R2-2207986](file:///C:\Data\3GPP\Extracts\R2-2207986.docx) Discussion on target cell's timing for intra-satellite and inter-satellite handover under users of non-uniform spatio -temporal distribution BUPT discussion

[R2-2208147](file:///C:\Data\3GPP\Extracts\R2-2208147.docx) Discussion on ephemeris usage for NR NTN TURKCELL discussion Rel-18 Withdrawn

[R2-2208277](file:///C:\Data\3GPP\Extracts\R2-2208277%20(R18%20NTN%20WI%20AI%208.7.4)%20Idle-Inactive%20enhancements.docx) RRC Idle/Inactive measurement, mobility, and service continuity InterDigital discussion Rel-18 NR\_NTN\_enh-Core

[R2-2208278](file:///C:\Data\3GPP\Extracts\R2-2208278%20(R18%20NTN%20WI%20AI%208.7.4)%20Connected%20enhancements.docx) RRC Connected measurement, mobility, and service continuity InterDigital discussion Rel-18 NR\_NTN\_enh-Core

[R2-2208280](file:///C:\Data\3GPP\Extracts\R2-2208280_final.docx) Discussion on cell reselection enhancement for NTN LG Electronics France discussion Rel-18 NR\_NTN\_enh

[R2-2208282](file:///C:\Data\3GPP\Extracts\R2-2208282_final.docx) Reducing UE power consumption in idle inactive mode LG Electronics France discussion Rel-18 NR\_NTN\_enh

[R2-2208332](file:///C:\Data\3GPP\Extracts\R2-2208332_Cell%20reselection%20enhancements%20in%20NTN-NTN%20and%20NTN-TN%20mobility.docx) Cell reselection enhancements in NTN-NTN and NTN-TN mobility ZTE corporation, Sanechips discussion Rel-18

[R2-2208333](file:///C:\Data\3GPP\Extracts\R2-2208333_Discussion%20on%20NTN-NTN%20handover%20enhancement.docx) Discussion on NTN-NTN handover enhancement ZTE corporation, Sanechips discussion Rel-18

[R2-2208377](file:///C:\Data\3GPP\Extracts\R2-2208377%20Discussion%20on%20NTN%20Mobility%20Enhancements.docx) Discussion on NTN Mobility Enhancements CATT discussion Rel-18 NR\_NTN\_enh

[R2-2208424](file:///C:\Data\3GPP\Extracts\R2-2208424%20Discussion%20on%20cell%20reselection%20enhancements.docx) Discussion on cell reselection enhancements CMCC discussion Rel-18 NR\_NTN\_enh-Core

[R2-2208425](file:///C:\Data\3GPP\Extracts\R2-2208425%20Discussion%20on%20mobility%20enhancements%20for%20connected%20mode.docx) Discussion on mobility enhancements for connected mode CMCC discussion Rel-18 NR\_NTN\_enh-Core

[R2-2208641](file:///C:\Data\3GPP\Extracts\R2-2208641.docx) Discussion on ephemeris usage for NR NTN TURKCELL, Deutsche Telekom discussion Rel-18

[R2-2208670](file:///C:\Data\3GPP\Extracts\R2-2208670%20-%20R18%20NR%20NTN%20Mobility%20enhancements.docx) R18 NR NTN Mobility enhancements Ericsson discussion

[R2-2208671](file:///C:\Data\3GPP\Extracts\R2-2208671%20-%20R18%20NR%20NTN%20Idle%20mode%20Mobility%20enhancements.docx) R18 NR NTN Idle mode Mobility enhancements Ericsson discussion

Withdrawn

R2-2207732 Discussion on handover for NTN BUPT discussion Withdrawn

R2-2207892 Discussion on handover for NTN BUPT discussion Withdrawn

## Summary

Agreed CRs

Approved LSs out

[POST119-e] Email discussions

Short

Long