3GPP TSG-RAN WG2 Meeting #130 R2-2504673

Malta, May 19th – 23rd, 2025

**Agenda item: 9.3**

**Source: Session Chair (ZTE Corporation)**

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

**Document for: Approval**

Organizational

1. All organization emails and notes will be shared over the following email discussion throughout the meeting:
* [AT130][300] Organizational – NR-NTN and IoT-NTN session

Scope:

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

Schedule/Plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Main room****Dragonara** | **Brk 1 room****Pavillion** | **Brk 2 room** **St Georges** | **Brk 3 room\*** **Castillian** |
| **Monday**  |
| 09:00 – 10:30 | **[1], [2], [3],** **[7.0] R18 common (Diana)**[7.0.1] UE capabilities**[8.0] NR19 General (ASN.1)****Break out** **[2.5] specification improvements****@NR151617 UP (Diana)** **[7.0.2] Other Rel-18 corrections cont** | Breakout to start after completion of 7.0.1 and ASN.1 discussion **NR18 SL (Kyeongin)**[7.0.2.0] In-principle agreed CRs on SL[7.0.2.20] NR18 SL**[8.5] NR19 NES (if NR18 SL ends early) (Kyeongin)** [8.5.1] Organizational[8.5.4] Adaptation of common signal/channel  | **After morning coffee break (after the Main Room is split)****[6.1] NR17 relay documents (Nathan)****[7.0.2.19] NR18 SL Relay (Nathan)****[8.13] NR19 SL Relay (Nathan)**[8.13.3] Fast/parallel setup[8.13.1] if time allows | Breakout to start after completion of 7.0.1 and ASN.1 discussion **NRLTE151617 Pos (Nathan)**[4.3] LTE positioning[5.3] NR Rel-16 and earlier[6.3] NR Rel-17**[7.0.2.21] NR18 Pos (Nathan)** |
| 11:00 – 13:00 |
| 14:30 -16:30 | **[7.0.2] Other Rel-18 corrections cont****NES and then other topics****[7.0.2.11] NR TEI18****[7.8] Other Rel-18 corrections** **[8.19] TEI19** |  **NR18 Mob (Kyeongin)** [7.0.2.0] In-principle agreed CRs on Mob[7.0.2.22] NR18 Mob | **@14:30 – 15:30 R19 XR/NR Others (Dawid)**[8.7.1] Incoming LSes, running CRs/open issue lists[8.20.2] LS on RTP retransmission[8.7.3] Meas gap cancellation, if time allows**@15:30 [7.0.2.13] NR18 MIMO (Erlin)****[8.12] NR19 MIMO [0.75](Erlin)** [8.12.1][8.12.2] |
| 17:00– 19:00 | **[8.2] NR19 Ambient IoT [2.5] (Diana)**[8.2.2] Paging [8.2.4] Data transmission (segmentation) |  **[8.6] NR19 Mob (Kyeongin)**[8.6.1] Organizational[8.6.2] Inter-CU LTM | **[8.12] NR19 MIMO (Erlin) con’t**[8.12.2] cont.[8.12.3] if time allows**@18:00 [8.20] NR Others** [8.20.1] all topics except for CSSF opt. |
| **Tuesday** |
| 08:30 – 10:30 | **[8.3] NR19 AI/ML Mobility [2] (Diana)**[8.3.1] Organizational[8.3.2] Functionality management | **[8.4] NR19 LP-WUS [1] (Erlin)**[8.4.1][8.4.2][8.4.3][8.4.4] if time allows | **[8.13] NR19 SL Relay (Nathan)**[8.13.1] any leftovers from Monday[8.13.2][8.13.3] start |  |
| 11:00 – 13:00 | **[8.1] NR19 AI/ML PHY [2.5] (Diana)**[8.1.1] Organizational[8.2.2] LCM BM  | **NR18 NTN NR /IoT(Sergio)** [4.1] R17 IoT NTN corrections[6.1.1], [6.1.2], [6.1.3] R17 NTN corrections[7.0.2.17] R18 NR NTN corrections[7.0.2.18] R18 IoT NTN corrections[7.0.2.18] TEI18 (NTN related aspects)**[8.9] NR19 IoT NTN [1] Sergio**[8.9.3] Uplink Capacity Enhancements (if time allows)- including outcome of [301] | **EUTRA&NR151617 (Mattias)**Except NR17 NTN related Tdoc, which will be handled in Sergio´s session.[4.1][5.1.1], [5.1.3.1], [5.1.3.2], [5.1.3.3][6.1.1], [6.1.3], [6.1.3.1], [6.1.3.2], [6.1.3.3] |  |
| 14:30 -16:30 | **[8.2] NR19 Ambient IoT [2] (Diana)**[8.2.1] Organizational[8.2.3] Random Access | **[8.8] NR19 NR NTN (Sergio) [2]**[8.8.1] Organizational[8.8.2] Downlink coverage enhancements | **[8.18] EUTRA MBS (Dawid) [0.25]****[7.0.2.11] NR18 SON/MDT** **[8.10] NR19 SONMDT [0.5] (Mattias)** |  |
| 17:00– 19:00 | **[8.6] NR19 Mob [2] (Kyeongin)**17:00-17:30: MAC offline17:30-19:00[8.6.2] Inter-CU LTM (if needed)[8.6.3] L1 event-triggered MR  | **[8.7] NR19 XR [2] (Dawid)**[8.7.5] Timely retransmissions[8.7.5] Unnecessary reTx avoidance[8.7.4.1] LCP enhancements[8.7.4.2] DSR enhancements, if time allows | **[8.10] NR19 SONMDT [0.5] (Mattias) con’t** |  |
| **Wednesday** |
| 08:30 – 10:20 | **[8.6] NR19 Mob [2] (Kyeongin)**08:30-09:40[8.6.3] L1 event-triggered MR (if needed)[8.6.4] C-LTM09:40-10:20: RRC offline | **[8.7] NR19 XR [2] (Dawid)**[8.7.4.2] DSR enhancements cont.[8.7.6] XR rate control[8.7.3] Meas gap cancellation (if not treated on Monday) | **Offline slot** **@9:30 [8.19] NR19 NR Other (Erlin)** [8.20.1] CSSF opt., other topics if needed[8.20.2] MCE |  |
| 10:45– 12:35 | **[8.3] NR19 AI/ML Mobility [2] (Diana)**[8.3.3] config and reporting[8.3.5] performance monitoring | **[8.5] NR19 Network Energy Saving [1] (Kyeongin)**[8.5.4] Adaptation of common signal/channel (if needed)[8.5.2] OD-SSB  | **[8.11] NR19 SBFD [0.75] (Erlin)**[8.11.1][8.11.2][8.11.3] if time allows |  |
| 14:00 -15:50 | **[8.1] NR19 AI/ML PHY [2.5] (Diana)**[8.2.2] LCM Positioning[8.2.3] NW sided data collection | **[8.9] NR19 IoT NTN [1] Sergio**[8.9.1] Organizational[8.9.3] Uplink Capacity Enhancements (cont) | **[6.1][7.0.2.19] NR1718 SL relay CB (Nathan)****[8.13] NR19 SL relay (Nathan)**[8.13.3] cont.[8.13.4] |  |
|  |
| 16:10– 18:00 | **@17:00-18:30 AI/ML PHY cont**[8.2.3] NW sided data collection[8.2.4] UE sided data collection**[8.19] TEI19 if needed** | **[8.17] R19 IoT NTN TDD mode [0.5]****[8.8] NR19 NR NTN [2] (Sergio)**[8.8.4] Support of Broadcast service | **[8.15] NR19 NavIC****[7.0.2.21] NR18 Pos (Nathan) and TEI19 positioning** |  |
|  |
| 18:30 | Charity Fun Run/Walk |
| **Thursday** |
| **Colourful Polo day**  |
| 08:30 – 10:30 | **@9:00 [8.1] NR19 AI/ML PHY [2.5] (Diana) CBs or remaining items from other AIs**[8.2.5] Model transfer (if time allows) | **[4.1], [7.0.2.18], [7.0.2.20] R18 IoT NTN** - issues marked CB Thursday- outcome of [302]**[8.9] R19 IoT NTN CB** [8.9.2] Support of S&F | CB Nathan**[7.0.2.21] NR18 Positioning** **[7.0.2.19] NR18 SL relay****[8.13] NR19 SL relay**  |  |
|  |
| 11:00 – 13:00 | **[8.2] NR19 Ambient IoT [2.5] (Diana)**[8.2.4] Data transmission | **[6.1.x], [7.0.2.17] NR18 NR NTN** - issues marked CB Thursday**8.8] NR19 NR NTN CB** - outcome of [303] and [304][8.8.4] Support of Broadcast service- issues marked CB Thursday[8.8.6] LTE to NR NTN mobility[8.8.3] Uplink Capacity/Throughput Enhancement**[8.18] TEI19** (NTN related aspects) | **CB Mattias****CB EUTRA&NR151617 (Mattias)****[8.10] CB SON/MDT R19** |  |
| 14:30 -16:30 | **@14:30-15:30 CB AIoT** **CBs****@15:30-16:30 CB** **NR19 AI/ML Mobility** CBs [8.3.4] Data collection | **[7.0.2.20] CB NR18 SL** **(Kyeongin)** **[8.5] CB NR19 NES (Kyeongin)**Comebacks on SL and NES[8.5.2] OD-SSB (if needed)[8.5.3] OD-SIB1 | CB Erlin **[8.4] NR19 LP-WUS (Erlin) CBs/Continuation****Details to be added** |  |
|  |
| 17:00 – 19:00 | **CB NR 18 and TEI19 Diana** | **[7.0.2.22] CB NR18 Mob (Kyeongin)****[8.6] CB NR19 Mob (Kyeongin)**Comebacks on R18/19 Mob[8.6.4] C-LTM | CB Dawid:**[8.7] NR19 XR CB/continuation** |  |
| **Friday**  |
| 08:30 – 10:30 | CB Diana TBD**@9:30-10:30 CB Ambient IoT** | **CB Sergio (from 9:00)****[7.0.2]**- issues marked CB Friday**[8.9] NR19 IoT NTN** [8.9.3] Uplink Capacity Enhancements- outcome of [301], [305], [306][8.9.4] Support of PWS**[8.18] TEI19** (NTN related aspects) (cont) | CB Erlin NR19 MIMOCB NR19 SBFD, NR19 Others **Details to be added** |  |
| 11:00 – 13:00 | CB Diana@11-12 R19 Ambient IoTOther CBsReports from breakout sessionsEoM |  |  |
| 14:30 – 16:00 |  |  |  |
| 16:00 – 17:00 |  |  |  |  |

**Breaks**

Morning coffee: 10:30 to 11:00

Lunch: (see schedule) 13:00 to 14:30 (except Wednesday) and 13:00-15:00 TueThurdsay

Afternoon coffee: (see schedule) 16:30 to 17:00 (except Wednesday) and 17:00 to 17:30 Tue/Thursday

List and details of [AT130] offline discussions

NOTE: No offline email discussions will be kicked off before Monday May 19th, 09:00 local time

* [AT130][301][R19 IoT NTN] CB-msg4 design (Mediatek)

 Scope: discuss open issues MAC-12, MAC-13, MAC-14

 Intended outcome: summary of the offline discussion

 Offline time: Monday 2025-05-19 afternoon coffee break in BO3

 Deadline for offline discussion summary: Tuesday 2025-05-20 11:00

 Scope: discuss remaining two proposals for CB-msg4 design marked CB Friday

 Intended outcome: summary of the offline discussion

 Offline time: Thursday 2025-05-22 16:30-17:00 in BO3

 Deadline for offline discussion summary (in R2-2504778): Friday 2025-05-23 08:00

* [AT130][302][TEI18] In-band operation for NB-IoT (Ericsson)

 Scope: discuss the proposals in [R2-2504657](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504657%20-%20In-band%20operation%20for%20NB-IoT.docx) and [R2-2504139](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504139-IoT-NTN-NR-Inband.docx) and draft corresponding CRs

 Intended outcome: summary of the offline discussion and related CRs

 Deadline for companies’ feedback: Wednesday 2025-05-21 20:00

 Deadline for offline discussion summary (in R2-2504773): Thursday 2025-05-22 08:00

* [AT130][303][R19 NR NTN] NTN less than 5MHz (ZTE)

 Scope: discuss the R19 capability CR and whether any other change is needed to support NTN scenarios with less than 5MHz

 Intended outcome: revised 38.306 CR, other CRs, offline summary

 Deadline for companies' feedback: Wednesday 2025-05-21 20:00

 Deadline for CRs and offline summary: Thursday 2025-05-22 08:00

 Scope: draft reply LS to RAN4

 Intended outcome: draft LS

 Deadline for companies’ feedback: Thursday 2025-05-22 22:00

 Deadline for draft LS (in R2-2504785): Friday 2025-05-23 08:00

* [AT130][304][R19 NR NTN] DL CE (Xiaomi)

 Scope: continue the discussion on further details for the WA and on possible cell re-selection enhancements (e.g. considering the proposals in [R2-2503495](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503495%20Discussion%20on%20DL%20coverage%20enhancement.doc) and [R2-2504400](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504400-Analysis%20on%20DL%20coverage%20enhancements%20due%20to%20extended%20SSB%20periodicity.docx))

 Intended outcome: summary of the offline discussion

 Offline time: Wednesday 2025-05-21 afternoon coffee break in BO1

 Deadline for offline discussion summary (in R2-2504775): Thursday 2025-05-22 08:00

* [AT130][305][R19 IoT NTN] LS to RAN1 on CB-msg3-EDT (Huawei)

 Scope: draft LS to RAN1 on RAN2 decisions related to CB-msg3-EDT

 Intended outcome: draft LS

 Deadline for companies’ feedback: Thursday 2025-05-22 20:00

 Deadline for draft LS (in R2-2504776): Friday 2025-05-23 08:00

* [AT130][306][R19 IoT NTN] CB-RNTI (Ericsson)

 Scope: discuss the solution for CB-RNTI

 Intended outcome: summary of the offline discussion

 Offline time: Thursday 2025-05-22 16:00-16:30 in BO3

 Deadline for offline discussion summary (in R2-2504777): Friday 2025-05-23 08:00

## 4.1 EUTRA corrections Rel-17 and earlier

(LTE\_NBIOT\_eMTC\_NTN; leading WG: RAN1; REL-17; WID: [RP-211601](file:///C%3A%5CData%5C3GPP%5Carchive%5CRAN%5CRAN%2392%5CTdocs%5CRP-211601.zip))

[R2-2504332](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504332-R17%20CR%20IoT-NTN%20Correction%20to%20explicit%20indication%20of%20epoch%20in%20SIB31.docx) Correction to explicit indication of epoch in SIB31 Nordic Semiconductor ASA, Qualcomm, Mediatek Inc., Ericsson CR Rel-17 36.331 17.12.0 5127 - F LTE\_NBIOT\_eMTC\_NTN

* ZTE thinks we should change “received” into “transmitted”. ZTE also thinks we could refer to the end of the SI window.
* Xiaomi thinks we only need to add “the last repetition of”. QC thinks this is not sufficient
* Change “received” into “transmitted”.
* Fix the coversheet
* Revised into R2-2504763

[R2-2504763](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504763.zip) Correction to explicit indication of epoch in SIB31 Nordic Semiconductor ASA, Qualcomm, Mediatek Inc., Ericsson CR Rel-17 36.331 17.12.0 5127 1 F LTE\_NBIOT\_eMTC\_NTN

* Agreed

[R2-2504333](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504333-R18%20CR%20IoT-NTN%20Correction%20to%20explicit%20indication%20of%20epoch%20in%20SIB31.docx) Correction to explicit indication of epoch in SIB31 Nordic Semiconductor ASA, Qualcomm, Mediatek Inc., Ericsson CR Rel-18 36.331 18.5.0 5128 - A LTE\_NBIOT\_eMTC\_NTN

* Revised into R2-2504764

[R2-2504764](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504764.zip) Correction to explicit indication of epoch in SIB31 Nordic Semiconductor ASA, Qualcomm, Mediatek Inc., Ericsson CR Rel-18 36.331 18.5.0 5128 1 A LTE\_NBIOT\_eMTC\_NTN

* Agreed

[R2-2504335](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504335-DISC%20IoT-NTN%20Clarification%20to%20SI%20accumulation.docx) Clarification to NTN SI message accumulation over SI-windows Nordic Semiconductor ASA discussion Rel-17

Observation 3: The SI accumulation feature should not be used when acquiring SIB31(-NB) and SIB33(-NB).

Proposal 2: Clarify in the specifications that the SI accumulation shall not be used when acquiring SIB31(-NB) and SIB33(-NB).

* Vivo agrees with the intention but thinks the current spec already allows this UE behaviour.
* Google thinks this also depends on the SI window length
* Samsung thinks that at least in GEO case this would be useful
* Nokia thinks this issue is not new
* Ericsson wonders if the same problems exists for other SIB
* RAN2 understands that the UE is not required to perform SI accumulation across SI windows when acquiring SIB31(-NB) and SIB33(-NB) (no need for spec change)

[R2-2504336](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504336-R17%20CR%20IoT-NTN%20SI%20accumulation.docx) Clarification to NTN SI message accumulation over SI-windows Nordic Semiconductor ASA CR Rel-17 36.331 17.12.0 5129 - F LTE\_NBIOT\_eMTC\_NTN

* Not pursued

[R2-2504337](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504337-R18%20CR%20IoT-NTN%20SI%20accumulation.docx) Clarification to NTN SI message accumulation over SI-windows Nordic Semiconductor ASA CR Rel-18 36.331 18.5.0 5130 - A LTE\_NBIOT\_eMTC\_NTN

* Not pursued

## 6.1 Common

(NR\_NTN\_solutions-Core; leading WG: RAN2; REL-17; WID: [RP-211557](file:///C%3A%5CData%5C3GPP%5Carchive%5CRAN%5CRAN%2392%5CTdocs%5CRP-211557.zip))

[R2-2504661](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504661%20-%2038304_CR0438_%28Rel-17%29%20-%20Removal%20of%20PWS%20support%20in%20NR%20NTN.docx) Removal of PWS support in NR NTN Ericsson CR Rel-17 38.304 17.10.0 0438 - F NR\_NTN\_solutions-Core

* ZTE thinks we could wait for SA1 feedback. HW agrees and in case we could just have a Stage2 clarification
* Samsung prefers to have something in Stage3 as well and thinks we might need something for eMTC as well
* HW and ZTE think this is not needed.
* CATT thinks that if we need to clarify something it should be from system perspective
* Can come back in the next meeting

[R2-2504660](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504660%20-%2038304_CR0437_%28Rel-18%29%20-%20Removal%20of%20PWS%20support%20in%20NR%20NTN.docx) Removal of PWS support in NR NTN Ericsson CR Rel-18 38.304 18.4.0 0437 - A NR\_NTN\_enh-Core

* Can come back in the next meeting

### 6.1.1 Stage 2 and Organisational

Incoming LSs, etc. You should discuss your stage 2 CRs with the specification rapporteurs before submission. Includes impact to 38.300, 37.340, (36.300 if applicable)

[R2-2504520](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504520%20Clarification%20on%20redirection%20and%20cell%20reselection%20to%20NR%20NTN%20%28R17%29.docx) Clarification on redirection and cell reselection to NR NTN CATT, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-17 36.300 17.9.0 1418 - F NR\_NTN\_solutions-Core

* Oppo thinks the coversheet should be fixed
* Vivo thinks we could remove the reference and introduce the definition of NR NTN.
* Revised into R2-2504765 to fix the coversheet

[R2-2504765](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504765.zip) Clarification on redirection and cell reselection to NR NTN CATT, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-17 36.300 17.9.0 1418 1 F NR\_NTN\_solutions-Core

* Agreed

[R2-2504521](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504521%20Clarification%20on%20redirection%20and%20cell%20reselection%20to%20NR%20NTN%20%28R18%29.docx) Clarification on redirection and cell reselection to NR NTN CATT, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-18 36.300 18.4.0 1419 - A NR\_NTN\_solutions-Core

* Revised into R2-2504766 to fix the coversheet

[R2-2504766](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504766.zip) Clarification on redirection and cell reselection to NR NTN CATT, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-18 36.300 18.4.0 1419 1 A NR\_NTN\_solutions-Core

* Agreed

### 6.1.2 User Plane corrections

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

[R2-2504314](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504314%20P-CSI%20report%20in%20NTN.docx) Corrections on P-CSI report in NTN Qualcomm Incorporated discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1 RAN2 decide whether to adopt option#1 or option#2:

Option#1: In current symbol (n-UE’s TA), if drx-onDurationTimer of a DRX group would not be running, the UE does not report P-CSI on PUCCH in this DRX group.

Option#2: if drx-onDurationTimer would not be running prior to symbol n (i.e., UE is in DRX sleep prior to symbol n), it is up to UE implementation whether to wakeup from C-DRX sleep prior to symbol n to report periodic CSI.

* ZTE thinks symbol n refers to DL and thinks option 2 is already the UE behaviour
* HW can accept option 2. Apple agrees
* Draft a CR according to option 2 in R2-2504767

Proposal 2 Same as in P-SCI, clarification is added for periodic SRS.

* Cover also periodic SRS in the CR

[R2-2504767](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504767.zip) Corrections on P-CSI report in NTN Qualcomm Incorporated Rel-17 38.321 17.12.0 XXXX - F NR\_NTN\_solutions-Core

* Remove “considering UE’s TA”
* Revised into R2-2504784

[R2-2504784](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504784.zip) Corrections on P-CSI report in NTN Qualcomm Incorporated Rel-17 38.321 17.12.0 2095 1 F NR\_NTN\_solutions-Core

* Revised in R2-2504790 to also include the semi-persistent case

R2-2504790 Corrections on P-CSI report in NTN Qualcomm Incorporated Rel-17 38.321 17.12.0 2095 2 F NR\_NTN\_solutions-Core

* Agreed

[R2-2504768](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504768.zip) Corrections on P-CSI report in NTN Qualcomm Incorporated Rel-18 38.321 18.5.0 2096 - A NR\_NTN\_solutions-Core

* Revised in R2-2504936 to also include the semi-persistent case

R2-2504936 Corrections on P-CSI report in NTN Qualcomm Incorporated Rel-18 38.321 18.5.0 2096 1 A NR\_NTN\_solutions-Core

* Agreed

[R2-2504605](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504605%20Discussion%20on%20DCP%20and%20CSI%20report.doc) Discussion on DCP and CSI report Beijing Xiaomi Mobile Software discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1: Add a sentence in 38.306 to clarify that "In this release, DRX adaptation is not supported for NTN".

Proposal 2: The current symbol n is interpreted as uplink symbol. RAN2 to discuss whether to capture it in the spec or in the chair note. If it is clarified in the spec, from which release to capture.

* Noted

[R2-2504612](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504612_Clarification%20on%20the%20ambiguity%20of%20symbol%20n.docx) Clarification on the ambiguity of symbol n Xiaomi CR Rel-17 38.321 17.12.0 2094 - F NR\_NTN\_solutions-Core

* Not pursued

### 6.1.3 Control Plane corrections

#### 6.1.3.1 NR RRC

Corrections to 38331, and related change to other TS if applicable, except UE caps.

[R2-2504203](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504203%20correction%20on%20eventD1D2_v2.docx) Corrections on measurement with (cond)EventD1/D2/T1 Samsung discussion Rel-17 NR\_NTN\_solutions, NR\_NTN\_enh-Core

Observation 1: For eventD1/D2 distance measurement and condEventT1 time measurement, layer 3 filtering is also not applicable, thus, should be clarified as an exceptional case.

* RAN2 understands that only for (cond)EventD1/D2/T1, layer 3 filtering is not applicable (no spec change)

Proposal 1: Clarify in clause 5.5.3.1 that UE does not apply the layer 3 filtering as specified in 5.5.3.2 to derive distance measurements and time measurements.

* QC wonders if this is already clear
* Nokia agrees with the observation but doesn’t think we need to clarify this in the spec

Observation 2: Trigger quantity and measurement quantity are not defined for eventD1/D2 or condEventD1/D2/T1. It is not clear for UE how to derive cell measurement results for measurement configuration with eventD1/D2 or with condEventD1/D2/T1.

* Ericsson has a different understanding and thinks no spec changes are needed
* Samsung thinks it should be up to UE implementation whether/how to report RRM measurement results for neighbour cell for eventD1/D2. Nokia and Ericsson think that in any case the UE should report the RRM measurement report
* Nokia thinks we should have an aligned behaviour for all the relevant events and for other WIs we agreed that also neighbour cell measurements are provided
* Come back in the next meeting to continue the discussion on whether/how RRM measurements results for neighbour cells are performed for eventD1/D2.

Proposal 2: Clarify that UE doesn’t derive cell measurement results based on SSB or CSI-RS measurements for distance measurements and time measurements, considering trigger quantity or measurement quantity cannot be configured in these cases.

Observation 3: For CHO with condEventD1/D2/T1 only, it is not clear whether/how UE performs cell measurement based on SSB/CSI-RS when no RRM event is configured and how to determine applicable cell.

Proposal 3: To determine applicable cell for CHO with only condEventD1/D2/T1, clarify in clause 5.3.5.13.4 that UE considers the cell detected on the associated measObject which has a physical cell identity matching the value in CHO configuration.

Observation 4: For event-triggered measurement with eventD1/D2, it is not clear how UE determines applicable cell to be included in the measurement report.

Proposal 4: Capture a note that it is up to UE implementation to determine the applicable cell(s) for event-triggered measurement with eventD1/D2.

* QC supports this
* Xiaomi thinks this is not needed
* HW has a different understanding

[R2-2504204](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504204%20CR%20%28cond%29eventD1%20Rel-17%20v2.docx) Corrections on measurement with (cond)EventD1/T1 Samsung CR Rel-17 38.331 17.12.0 5365 - F NR\_NTN\_solutions

* Postponed

[R2-2504205](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504205%20CR%20%28cond%29eventD1%20Rel-18%20v4.docx) Corrections on measurement with (cond)EventD1/D2/T1 Samsung CR Rel-18 38.331 18.5.1 5366 - F NR\_NTN\_solutions, NR\_NTN\_enh-Core

* Postponed

#### 6.1.3.2 UE capabilities

UE cap corrections 38306, 38331.

[R2-2503937](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503937%20Capability%20for%20SMTC%20adjustment%20in%20RRC_IDLE%20and%20RRC_INACTIVE%20%28R17%29.docx) Capability for SMTC adjustment in RRC\_IDLE and RRC\_INACTIVE Huawei, HiSilicon, CMCC, Qualcomm Incorporated. CR Rel-17 38.306 17.12.0 1281 - F NR\_NTN\_solutions-Core

* Ericsson thinks we could add “between serving and neighbour satellite”. QC is not sure this is needed, or we should rather refer to cells
* Add “between serving and neighbour cells”
* Revised into R2-2504769

[R2-2504769](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504769.zip) Capability for SMTC adjustment in RRC\_IDLE and RRC\_INACTIVE Huawei, HiSilicon, CMCC, Qualcomm Incorporated. CR Rel-17 38.306 17.12.0 1281 1 F NR\_NTN\_solutions-Core

* Agreed

[R2-2503938](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503938%20Capability%20for%20SMTC%20adjustment%20in%20RRC_IDLE%20and%20RRC_INACTIVE%20%28R18%29.docx) Capability for SMTC adjustment in RRC\_IDLE and RRC\_INACTIVE Huawei, HiSilicon, CMCC, Qualcomm Incorporated. CR Rel-18 38.306 18.5.0 1282 - A NR\_NTN\_solutions-Core

* Revised into R2-2504770

[R2-2504770](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504770.zip) Capability for SMTC adjustment in RRC\_IDLE and RRC\_INACTIVE Huawei, HiSilicon, CMCC, Qualcomm Incorporated. CR Rel-18 38.306 18.5.0 1282 1 A NR\_NTN\_solutions-Core

* Agreed

[R2-2504315](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504315%20Rel-17%2038306%20DCP%20support.docx) Clarification on support of DCP in NTN Qualcomm Inc. CR Rel-17 38.306 17.12.0 1294 - F NR\_NTN\_solutions-Core

* Revise the change into “In this version of the specification this feature is not applicable in NTN”
* Revised in R2-2504771

R2-2504771 Clarification on support of DCP in NTN Qualcomm Inc., Xiaomi CR Rel-17 38.306 17.12.0 1294 1 F NR\_NTN\_solutions-Core

* Agreed

[R2-2504316](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504316%20Rel-18%2038306%20DCP%20support.docx) Clarification on support of DCP in NTN Qualcomm Inc. CR Rel-18 38.306 18.5.0 1295 - A NR\_NTN\_solutions-Core

* Revised in R2-2504772

R2-2504772 Clarification on support of DCP in NTN Qualcomm Inc., Xiaomi CR Rel-18 38.306 18.5.0 1295 1 A NR\_NTN\_solutions-Core

* Agreed

Moved here from 6.1.2

[R2-2504607](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504607_Clarification%20on%20not%20support%20DCP%20for%20NTN%28R17%29.docx) Clarification on not support DCP for NTN Xiaomi CR Rel-17 38.306 17.12.0 1304 - F NR\_NTN\_solutions-Core

* Not pursued

[R2-2504611](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504611_Clarification%20on%20not%20support%20DCP%20for%20NTN%28R18%29.docx) Clarification on not support DCP for NTN Xiaomi CR Rel-18 38.306 18.5.0 1305 - A NR\_NTN\_solutions-Core

* Not pursued

## 7.0 Common

Rel-18 WIs not covered under an explicit AI in 7.x. Multi-WI Rel-18 items, e.g. cross-WI-issues not handled under another WI. UE capabilities.

### 7.0.2 Rel-18 corrections

*Essential corrections only. For smaller corrections please contact CR editor / Rapporteur directly. Coordinate with rapporteurs and chair if input above limit is required*

*Tdoc limitation: 6*

#### 7.0.2.17 NR NTN enhancements

(NR\_NTN\_enh-Core; leading WG: RAN1; REL-18; WID: RP-232669)

IPA CRs

[R2-2503935](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503935%20Clarification%20on%20ssb-TimeOffset.docx) Clarification on ssb-TimeOffset Huawei, HiSilicon CR Rel-18 38.331 18.5.1 5335 2 F NR\_NTN\_enh-Core R2-2503066

* Agreed

[R2-2504217](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504217.docx) Correction to Rel-18 NR NTN CHO with only location/time-based trigger Samsung CR Rel-18 38.331 18.5.1 5314 1 F NR\_NTN\_enh-Core R2-2502669

* Revised in R2-2504684

[R2-2504684](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504684.docx) Correction to Rel-18 NR NTN CHO with only location/time-based trigger Samsung CR Rel-18 38.331 18.5.1 5314 2 F NR\_NTN\_enh-Core

* Agreed

[R2-2504220](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504220.docx) Correction to Rel-18 NR NTN CHO with only location/time-based trigger Samsung CR Rel-18 38.306 18.5.0 1263 1 F NR\_NTN\_enh-Core R2-2502670

* Revised in R2-2504685

[R2-2504685](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504685.docx) Correction to Rel-18 NR NTN CHO with only location/time-based trigger Samsung CR Rel-18 38.306 18.5.0 1263 2 F NR\_NTN\_enh-Core

* Agreed

[R2-2504650](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504650_CR1200r2_38306_Rel18_Correction%20on%20NTN%20in%20FR2%20bands.docx) Correction on NTN in FR2-NTN bands vivo, ZTE Corporation, Ericsson, Sanechips CR Rel-18 38.306 18.5.0 1200 2 F NR\_NTN\_enh-Core R2-2501782

* Agreed

Others

[R2-2504133](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504133%20Further%20Thoughts%20on%20IDC%20issue%20between%20GNSS%20and%20NTN%20UL.docx) Further Thoughts on IDC issue between GNSS and NTN UL Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_NTN\_enh-Core

Observation 1: RAN2 attempted to understand what kind of periodicity and duration of IDC free time could be required for the UE to measure GNSS.

Observation 2: RAN2 could not conclude without consulting other WGs, so sent the LS to RAN4, asking this group on the periodicity and duration of IDC free time to help the UE read the GNSS.

Observation 3: The LS from RAN2 has been discussed at RAN4#114bis, but without any consensus regarding the requirements to be indicated to RAN2.

Observation 4: It might turn out, RAN2 needs to proceed without the feedback from RAN4.

Observation 5: When multiple UEs use IDC-TDM scheme with maximum values of activeDuration and cycle length, it results in 15% of UL transmissions that might be avoided. This brings a serious complexity to NW’s scheduler.

Proposal 1: Do not consider an extension of autonomousDenialSlots which would increase the number of slots the UE can autonomously deny and bring additional complexity to UL scheduling.

Proposal 2: If a specification change to address the IDC issue is needed, consider extending the length of the activeDuration in IDC-TDM solution.

* We wait to see whether further feedback from RAN4 will be provided

[R2-2504339](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504339%20Rel-18%2038331%20RP%20for%20hard%20satellite%20switch.docx) Clarification on reference point for hard satellite switch with resynchronization Qualcomm Incorporated, Huawei CR Rel-18 38.331 18.5.1 5372 - F NR\_NTN\_enh-Core

* Xiaomi supports this and thinks we should clarify the behaviour for T-service
* Nokia thinks the CR is not needed. Vivo agrees
* RAN2 understands that for hard satellite switch with resynchronization, the network does not include SSB-timeOffset and t-ServiceStart
* Can come back to see whether this needs to be clarified in the specs

Withdrawn

R2-2504206 Corrections on measurement with (cond)EventD1/D2/T1 Samsung CR Rel-18 38.331 18.5.1 5367 - F NR\_NTN\_enh-Core Withdrawn

R2-2504313 Clarification on reference point for hard satellite switch with resynchronization Qualcomm Incorporated, Huawei CR Rel-18 38.321 18.5.0 2085 - F NR\_NTN\_enh-Core Withdrawn

#### 7.0.2.18 IoT NTN enhancements

(IoT\_NTN\_enh-Core; leading WG: RAN2; REL-18; WID: [RP-223519](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_98e/Docs/RP-223519.zip))

IPA CRs

[R2-2504067](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504067%20Correction%20on%20SIB33%20reception%20in%20RRC_CONNECTED.docx) Correction on SIB33 reception in RRC\_CONNECTED Huawei, HiSilicon CR Rel-18 36.331 18.5.0 5105 2 F IoT\_NTN\_enh-Core R2-2501968

* Agreed

[R2-2504089](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504089%20Corrections%20to%20location%20based%20measurement.docx) Corrections to location-based measurement ZTE Corporation, Ericsson, CATT, Sanechips CR Rel-18 36.300 18.4.0 1417 2 F IoT\_NTN\_enh-Core R2-2503062

* Agreed

Others

[R2-2504095](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504095%20Various%20corrections%20on%20connected%20mode%20RRM%20for%20IoT%20NTN.docx) Various corrections on connected mode RRM for IoT NTN Samsung CR Rel-18 36.331 18.5.0 5121 - F IoT\_NTN\_enh-Core

* Ericsson supports the second change but has a different understanding for the first. ZTE agrees
* HW thinks that ephemeris are also provided in SIB
* HW also do not agree with the second change
* Can come back in the next meeting

#### 7.0.2.20 TEI18

Moved here from 7.0.2.18

[R2-2504657](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504657%20-%20In-band%20operation%20for%20NB-IoT.docx) In-band operation for NB-IoT Ericsson discussion Rel-18 IoT\_NTN\_enh-Core, TEI18

Proposal 1 Clarify in Stage 2 that only the same operation mode for anchor and non-anchor carrier is supported in NTN.

* ZTE thinks there is no need to restrict this in RAN2 specs.
* Vivo thinks we need to clarify which cases are supported and then supports all the proposals
* QC also supports
* Agreed (can further discuss the wording)

Proposal 2 Following option a), introduce a note in Table 5.5a-1 to clarify operation mode in NB-IoT NTN.

Proposal 3 There are no stage 3 issues related to the introduction of in-band support for NB-IoT.

* Continue in offline 302 for all proposals

[R2-2504139](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504139-IoT-NTN-NR-Inband.docx) RAN2 Impacts for NR NB-IoT-NTN Nokia , Nokia Shanghai Bells discussion

Proposal 1: RAN2 to consider NOTE for Table5.5a-1 to capture supported operating modes for IoT-NTN and also the combinations for multi-carrier operation.

Proposal 2: RAN2 to discuss whether UE capability without signalling is needed to indicate the UE support for new deployment mode.

* QC thinks we need a capability with signalling
* HW thinks we should wait for RAN4 to decide on the capability
* Continue in offline 302 for all proposals
* [AT130][302][TEI18] In-band operation for NB-IoT (Ericsson)

 Scope: discuss the proposals in [R2-2504657](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504657%20-%20In-band%20operation%20for%20NB-IoT.docx) and [R2-2504139](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504139-IoT-NTN-NR-Inband.docx) and draft corresponding CRs

 Intended outcome: summary of the offline discussion and related CRs

 Deadline for companies’ feedback: Wednesday 2025-05-21 20:00

 Deadline for offline discussion summary (in R2-2504773): Thursday 2025-05-22 08:00

[R2-2504773](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504773.zip) Report of [AT130][302][TEI18] In-band operation for NB-IoT Ericsson discussion TEI18

Proposal 1 A capability with signalling is not introduced for NB-IoT NTN in-band operation mode within NR NTN (4/7).

* QC thinks this is different for the TN case so a dedicated capability is needed.
* Nordic thinks it can work without
* HW thinks the capability is not needed, RAN4 finished the work without identifying the need for a capability. Nokia agrees
* MTK thinks we should have an optional capability without signalling. Ericsson thinks we already agreed that we would not have this unless required by RAN4
* Nokia and Nordic can accept an optional capability without signalling
* HW would still like to wait for an indication from RAN4 that this is needed and thinks that companies can raise this in the discussion for the RAN4 feature list
* Send an LS to RAN4 attaching our agreed Stage 2 CR and leaving the decision to introduce a capability for this (or not) to them
* Draft an LS in R2-2504783

Proposal 2 RAN2 does not introduce Stage 3 changes for NB-IoT NTN in-band operation mode within NR NTN (5/7).

* MTK thinks we need a clarification
* Vivo thinks everything would be clear from RAN4 specs
* Can come back to this

[R2-2504781](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504781.zip) (TEI18) Introduction of the inband operation for NTN IoT in NR NTN [NTNNBIoT\_inbandNTNNR] Ericsson DraftCR Rel-18 36.300 B TEI18

* Nokia and MTK can accept this formulation
* Changes are agreeable and CR1420 is revised accordingly

[R2-2504658](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504658%20-%2036300_CR1420_%28Rel-18%29%20-%20Introduction%20of%20the%20inband%20operation%20for%20NTN%20IoT%20in%20NR%20NTN.docx) Introduction of the inband operation for NTN IoT in NR NTN Ericsson, Samsung CR Rel-18 36.300 18.4.0 1420 - C IoT\_NTN\_enh-Core, TEI18

* Revised in R2-2504782

[R2-2504782](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504782.zip) Introduction of the inband operation for NTN IoT in NR NTN Ericsson, Samsung, vivo CR Rel-18 36.300 18.4.0 1420 1 B TEI18-XXXX

* Revised in R2-2504789 to add a reference to the capability CR

[R2-2504789](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504789.zip) Introduction of the inband operation for NTN IoT in NR NTN Ericsson, Samsung, vivo CR Rel-18 36.300 18.4.0 1420 2 B TEI18-XXXX

* Agreed

[R2-2504783](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504783.zip) Draft LS on inband operation for NTN IoT in NR NTN Ericsson LS out To: RAN4

* Ericsson thinks we could also go one step ahead and agree to have an optional capability without signalling for this (and spare some time in RAN4)
* HW can accept this if this is the majority view
* We introduce an optional capability without signalling to indicate support for this and draft a capability CR accordingly in R2-2404786
* LS is revised into R2-2504787 to indicate RAN2 agreements and removing questions (also remove Draft, put RAN2 as source and fix the meeting dates)

[R2-2504786](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504786.zip) Introduction of the inband operation for NTN IoT in NR NTN [NTNNBIoT\_inbandNTNNR] Ericsson, Samsung, vivo CR Rel-18 36.300 18.4.0 1913 - B TEI18-

* Agreed

[R2-2504787](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504787.zip) LS on inband operation for NTN IoT in NR NTN Ericsson LS out To: RAN4

* Agreed

[R2-2503359](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503359_CR1421_36300_Rel18_Introduction%20of%20NB-IoT%20NTN%20in-band%20operation%20with%20NR%20NTN.docx) Introduction of NB-IoT NTN in-band operation with NR NTN vivo CR Rel-18 36.300 18.4.0 1421 - B TEI18

* Not pursued

## 8.8 NTN for NR Ph3

(NR\_NTN\_Ph3-Core; leading WG: RAN2; REL-19; WID: [RP-243300](file:///C%3A%5CData%5C3GPP%5Carchive%5CRAN%5CRAN%23106%5CTdocs%5CRP-243300.zip))

LTE\_TN\_NR\_NTN\_mob, leading WG: RAN2, Rel-19 WID: [RP-240924](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_104/Docs/RP-240924.zip))

Time budget: 2 TU

Tdoc Limitation: 3 tdocs

### 8.8.1 Organizational

LS, Rapporteur input, including workplan, running CRs, open issues lists, etc.

For the LTE\_TN\_NR\_NTN\_mob WI, including endorsed draft CRs from the WI spec rapporteurs.

Rapporteur inputs do not count towards the tdoc limitation.

Running CRs and lists of open issues for NR\_NTN\_Ph3-Core

[R2-2504630](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504630%20Draft%20Stage%202%20CR%20for%20NTN%20Ph3_v08_cl.docx) Discussion on NTN MBS broadcast description in Stage 2 CR THALES discussion Rel-19 NR\_NTN\_Ph3-Core

* Revise the Stage 2 running Draft CR into R2-2504761 reflecting the meeting agreements

[R2-2504761](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504761.zip) Stage 2 Running CR for NR NTN phase 3 THALES draftCR Rel-19 38.300 18.5.0 NR\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504629](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504629%20Discussion%20Stage%202%20CR.docx) Stage 2 Running CR for NR NTN phase 3 THALES draftCR Rel-19 38.300 18.5.0 NR\_NTN\_Ph3-Core

Proposal 1 RAN2 down select one of the below options on how to capture MBS broadcast in Stage 2:

Option 1 : NTN MBS broadcast should be described in the MBS section §16.10 as enhancements for NTN only

Option 2 : NTN MBS broadcast should be described in a new sub-section §16.14.X in the NTN section as a new feature of NTN

Option 3 : Keep [2] MBS broadcast descriptions for stage 2 (i.e. RAN3 endorsed BL CR and new SIB description)

* Xiaomi thinks option 3 is sufficient
* ZTE prefers option 2
* Nokia would like to avoid option 1 and think we can go for a combination of option 2 and 3. QC agrees
* We can consider RAN2 specific changes according to option 2 on top of what agreed by RAN3

[R2-2504656](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504656%20-%2038331_%28Rel-19%29%20-%20Running%20RRC%20CR%20for%20NR%20NTN%20phase%203.docx) Running RRC CR for NR NTN phase 3 Ericsson draftCR Rel-19 38.331 18.5.1 B NR\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504659](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504659%20-%20Remaining%20RRC%20open%20issues%20for%20NR%20NTN%20Rel-19.docx) Remaining RRC open issues for NR NTN Rel-19 Ericsson discussion Rel-19 NR\_NTN\_Ph3-Core

[Proposals for easy agreement]

Proposal 1 If a new SMTC periodicity is finally adopted and included in system information broadcast, RAN2 introduces the support in a backwards compatible manner. FFS signalling details (e.g., new field or extension of SMTC4).

* We introduce support for SMTC enhancements in idle/inactive mode in a backwards compatible manner. FFS signalling details (e.g., new field or extension of SMTC4).

Proposal 2 RAN2 includes the mapping between a MBS broadcast session (TMGI) and ISA ID(s) extending MBS-SessionInfoList to avoid signaling overhead (duplication of TMGIs).

* Agreed

Proposal 3 For the service continuity discussion in MBS NR NTN, RAN2 takes the following scenarios as a baseline:

• Multiple frequencies, served by the same satellite, illuminating the same geographical area. Each frequency provides a different MBS service. These services are not being broadcast in the serving cell.

• Multiple frequencies, served by the same or different satellites, but not covering the same geographical area (they are neighbour cells). Each frequency provides a different MBS service. These services are not being broadcast in the serving cell.

* QC wonders if we need to restrict the scenarios
* Nokia supports focussing the discussion on service continuity based on the scenarios in p3. Thales agrees
* Apple thinks that also the scenario of multiple frequencies supporting the same MBS service should be considered. CATT thinks there is no enhancement for this scenario also in the TN case

[Proposals for discussion]

Proposal 4 Companies are encouraged to address the following topics in their contributions:

• Maximum number of SMTCs that need to be supported (e.g., 6).

• Association of SMTC with location/beam information (e.g. serving cell SSB index, reference location).

• Nature of SIBXX defining the intended service area: cell or area specific.

Agreements:

1. Introduce support for SMTC enhancements in idle/inactive mode in a backwards compatible manner. FFS signalling details (e.g., new field or extension of SMTC4).

2. Introduce mapping between a MBS broadcast session (TMGI) and ISA ID(s) extending MBS-SessionInfoList to avoid signaling overhead (duplication of TMGIs).

[R2-2504077](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504077%20Stage-3%20running%20304%20CR%20for%20NR%20NTN.docx) Running 38.304 CR for NR NTN ZTE Corporation, Sanechips draftCR Rel-19 38.304 18.4.0 B NR\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504078](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504078%20Remaining%20304%20open%20issues%20for%20NR%20NTN.docx) Remaining 304 open issues for NR NTN ZTE Corporation, Sanechips report Rel-19 NR\_NTN\_Ph3-Core

Proposal 1: Below open issue is included in 304 running CR open issue list for companies to contribute next meeting:

Open issue idle/inactive-1: RAN2 can further discuss whether and how to enhance cell (re)selection procedure due to DL CE

Proposal 2: When using ISA(s) for MBS broadcast service reception or MBS service continuity, it is up to UE implementation on how to determine it is in the ISA(s) of MBS broadcast service or not. FFS capture it in stage 3 or in stage 2.

* ZTE and vivo think the statement should be in Stage 3
* Capture in a Note in Stage 2 that when using ISA(s) for MBS broadcast service reception or MBS service continuity, it is up to UE implementation how to determine if it is in the ISA(s) of MBS broadcast service or not.

Agreements:

1. Capture in a Note in Stage 2 that when using ISA(s) for MBS broadcast service reception or MBS service continuity, it is up to UE implementation how to determine if it is in the ISA(s) of MBS broadcast service or not.

[R2-2504171](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504171_38.306%20UE%20capability%20running%20CR%20on%20NR%20NTN_v6_clean.docx) Draft CR for Rel-19 NR NTN UE capabilities Apple draftCR Rel-19 38.306 18.5.0 B NR\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504170](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504170_Open%20issue%20list%20for%20NR%20NTN%20UE%20capability_v1_Rapp.doc) Open issues of Rel-19 NR NTN UE capabilities Apple discussion Rel-19 NR\_NTN\_Ph3-Core

Proposal 1: Implementation of ETWS geo-fencing UE capability for NTN is added to existing ETWS feature.

* Implementation of ETWS geo-fencing and PWS UE capability for NTN is added to the PWS feature

Proposal 2: UE capability discussion on SMTC enhancement is postponed until the functionality is determined.

Agreements:

1. Implementation of ETWS geo-fencing and PWS UE capability for NTN is added to the PWS feature

Running CRs for LTE\_TN\_NR\_NTN\_mob WI

[R2-2504096](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504096%20Introduction%20of%20Stage%202%20for%20LTE%20TN%20to%20NR%20NTN%20idle%20mode%20mobility.docx) Introduction of stage 2 for LTE TN to NR NTN idle mode mobility Samsung CR Rel-19 36.300 18.4.0 1412 4 B LTE\_TN\_NR\_NTN\_mob R2-2501416

* Endorsed

[R2-2504530](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504530%20Introduction%20of%20LTE%20TN%20to%20NR%20NTN%20IDLE%20mode%20mobility%20%28Rev.5%29.docx) Introduction of LTE TN to NR NTN IDLE mode mobility CATT CR Rel-19 36.331 18.5.0 5065 5 B LTE\_TN\_NR\_NTN\_mob-Core R2-2501418 Late

* Endorsed

[R2-2503358](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503358_CR1200r3_36306_Rel19_Introduction%20of%20LTE%20TN%20to%20NR%20NTN%20Mobility%20UE%20Capability.docx) Introduction of LTE TN to NR NTN Mobility UE Capability vivo CR Rel-19 36.306 18.4.0 1900 4 B LTE\_TN\_NR\_NTN\_mob-Core R2-2501417

* Xiaomi thinks we should revise the last “if” into “whether”
* Endorsed

Other

[R2-2504632](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504632%20Discussion%20k-mac%20NR%20NTN.docx) Discussion to align NR NTN k-Mac with IoT NTN TDD k-Mac THALES discussion Rel-19 NR\_NTN\_Ph3-Core

Observation 1 It is beneficial for transparent architecture deployement with a limited number of gatewey to support extension of k-Mac parameter

Observation 2 K-Mac extension up to 1023 ms was agreed for IoT NTN TDD that would make an inconsistency between different NTN deployement scenarios

Proposal 1 For NR NTN, support k-Mac with a value range up to 1023 ms for Rel-19

* Xiaomi thinks we should think about backward compatibility issues
* Samsung would support this if combined with the introduction of a new barring bit. ZTE tends to agree
* QC would also like to understand which deployment would really need this
* Can come back to this in the next meeting

Moved here from 8.0

[R2-2503324](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503324_R4-2504712.docx) LS on UE capability signalling for NTN less than 5MHz (R4-2504712; contact: ZTE, Xiaomi) RAN4 LS in Rel-19 NR\_IoT\_NTN\_req\_test\_enh To:RAN2

* QC wonders if on top of adding new capabilities we need other changes to avoid impacts to legacy UEs. Vivo thinks there is no issue
* Noted

[R2-2504668](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504668_less%20than%205Mhz%20for%20NR%20NTN.docx) Introduction of UE capability signalling for NTN less than 5MHz Xiaomi CR Rel-19 38.306 18.5.0 1306 - B NR\_NTN\_Ph3-Core

* Not pursued

[R2-2504669](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504669%20Introduce%20UE%20capability%20siganlling%20for%20NTN%20less%20than%205MHz.docx) Introduce UE capability signalling for NTN less than 5MHz ZTE Corporation, Sanechips CR Rel-19 38.306 18.5.0 1307 - B NR\_NTN\_Ph3-Core

* Continue the discussion in offline 303
* Revised in R2-2504774

[R2-2504774](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504774.zip) Introduce UE capability signalling for NTN less than 5MHz ZTE Corporation, Sanechips CR Rel-19 38.306 18.5.0 1307 1 B NR\_IoT\_NTN\_req\_test\_enh

* Content of the CR is endorsed (the CR can be resubmitted for the next meeting and updated if there is a need to update the reference to align with RAN4 specification)

[R2-2504779](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504779.zip) Introduce support for NTN less than 5MHz ZTE Corporation, Sanechips CR Rel-19 38.331 18.5.0 XXXX - B NR\_IoT\_NTN\_req\_test\_enh

* Content of the CR is endorsed (the CR can be resubmitted for the next meeting and updated if there is a need to update the reference to align with RAN4 specification)

[R2-2504780](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504780.zip) Report of [AT130][303][R19 NR NTN] NTN less than 5MHz ZTE discussion NR\_NTN\_Ph3-Core

Proposal 1: The CR content in R2-2504774 can be endorsed. Can be updated if there is a need to update the reference to align with RAN4 specification.

* Agreed

Proposal 2: For NTN less than 5MHz support, there is no need to clarify measIdleCarrierListNR-LessThan5MHz.

* RAN2 understands that measIdleCarrierListNR-LessThan5MHz is not applicable in NTN

Proposal 3: Add reference to 38.101-5 in the conditional presence description of LessThan5MHz in SIB4.

* Agreed

Proposal 4: To deal with backward capability issue, TN approach i1s reused for less than 5MHz in NTN, i.e., use reserved value 250 for dl-CarrierFreq (without suffix) and 200 for frequencyBandList (without suffix) respectively when dl-CarrierFreq-r18 and frequencyBandList-r18 presents. (no specs impact).

* To deal with backward capability issue, TN approach is reused for less than 5MHz in NTN (no spec impact)
* Send an LS RAN4 to inform them above this RAN2 agreement and ask them to discuss necessary specs updates.
* Draft an LS to RAN4 in R2-2404785

Proposal 5: Confirm below RAN2 understanding (no specs impact):

- If a frequency is not included in NTN-NeighCellConfig-r17 in SIB19 but present in InterFreqCarrierFreqInfo-v1800 in SIB4, UE supporting less than 5MHz understands it is a TN cell with less than 5MHz, and considers the frequency for TN measurements.

- If a frequency is included in NTN-NeighCellConfig-r17 in SIB19 and InterFreqCarrierFreqInfo-v1800 doesn’t present in SIB4, UE knows there is no cell in this frequency is less than 5MHz cell.

* RAN2 understands that (no spec change):

If a frequency is not included in NTN-NeighCellConfig-r17 in SIB19 but present in InterFreqCarrierFreqInfo-v1800 in SIB4, UE supporting less than 5MHz understands it is a TN cell with less than 5MHz, and considers the frequency for TN measurements.

If a frequency is included in NTN-NeighCellConfig-r17 in SIB19 and not included in InterFreqCarrierFreqInfo-v1800 in SIB4, UE knows there is no less than 5MHz cell in this frequency

P6. If P4 is agreed, send an LS RAN4 to inform them above this RAN2 agreement and ask them to discuss necessary specs updates.

* Agreed
* [AT130][303][R19 NR NTN] NTN less than 5MHz (ZTE)

 Scope: discuss the R19 capability CR and whether any other change is needed to support NTN scenarios with less than 5MHz

 Intended outcome: revised 38.306 CR, other CRs, offline summary

 Deadline for companies' feedback: Wednesday 2025-05-21 20:00

 Deadline for CRs and offline summary: Thursday 2025-05-22 08:00

 Scope: draft reply LS to RAN4

 Intended outcome: draft LS

 Deadline for companies’ feedback: Thursday 2025-05-22 22:00

 Deadline for draft LS (in R2-2504785): Friday 2025-05-23 08:00

[R2-2504785](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504785.zip) Draft Reply LS on UE capability signalling for NTN less than 5MHz LS out Rel-19 NR\_IoT\_NTN\_req\_test\_enh To:RAN4

* Remove Draft and put RAN2 as source
* Revised in R2-2404788

[R2-2504788](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504788.zip) Reply LS on UE capability signalling for NTN less than 5MHz LS out Rel-19 NR\_IoT\_NTN\_req\_test\_enh To:RAN4

* Approved

Withdrawn

R2-2503463 Introduction of LTE TN to NR NTN IDLE mode mobility CATT CR Rel-19 36.331 18.5.0 5065 4 B LTE\_TN\_NR\_NTN\_mob-Core R2-2501418 Withdrawn

### 8.8.2 Downlink coverage enhancements

Contributions should focus on RAN2 aspects of DL coverage enhancements due to extended SIB periodicity (up to 160ms), including e.g. possible SMTC impacts (while no contributions are expected on cell level / beam level DTX/DRX mechanism).

[R2-2504571](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504571%20Discussion%20on%20Downlink%20Coverage%20Enhancements.docx) Discussion on Downlink Coverage Enhancements CSCN, Huawei, HiSilicon, ZTE corporation, Sanechips, CATT discussion Rel-19 NR\_NTN\_Ph3-Core

Proposal 1: RAN2 to introduce SSB-based solution for SMTC enhancement in RRC\_Idle/Inactive.

* Nokia wonders if this solution is based on the SSB-index

Proposal 2: RAN2 to consider the following options for enhanced SMTCs and measurement gaps configurations for UEs in RRC\_CONNECTED:

Option 1: Measurement report based solution (D1/D2 enhancement, new event D)

Option 2: UAI with multiple areas or locations.

* QC thinks that legacy procedures are sufficient. Vivo agrees. Google/LG/Samsung/Xiaomi/Oppo also agree
* HW thinks that it’s not clear which legacy procedure could be used in this case
* WA: We introduce a mechanism to assist the NW to configure the SMTCs in connected mode
* Continue in offline 304 on further details for the WA

[R2-2503495](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503495%20Discussion%20on%20DL%20coverage%20enhancement.doc) Discussion on DL coverage enhancement Xiaomi discussion Rel-19 NR\_NTN\_Ph3-Core

* RRC open issues:

Proposal 1: (RRC-1)RAN2 to agree that the maximum configured SMTCs per frequency for idle/inactive UEs is 6.

- HW wonders if this includes the serving cell

* Agreed (can come back if we find an issue)

Observation 1: If cell is configured with idle/inactive mode location based neighbor cell measurement initiation or UE is stationary or low mobility, neighbor cell reference location based SMTC selection can achieve the maximum power saving gain.

Observation 2: If cell is configured with multiple SSBs and not configured with idle/inactive mode location based neighbor cell measurement initiation and UE is high mobility, serving cell SSB index based SMTC selection can achieve the maximum power saving gain.

Proposal 2: (RRC-2)RAN2 consider support both neighbor cell reference location based SMTC selection and serving cell SSB index based SMTC selection.

- Lenovo thinks the neighbor cell reference location based SMTC selection implies more effort for the UE

- LG (and others) think the serving cell SSB index based SMTC selection does not cover all the cases

- Toyota thinks we should only have one solution and it should be the location based solution

- CT thinks the location based solution provides more information for the UE to select the correct SMTC

- CATT thinks no solution is perfect and in this case we could support both.

Proposal 3: (RRC-2)For reference location based solution, new IEs similar to ReferenceLocation-r17 and tn-DistanceRadius-r18 are introduced for reference location and cell radius of neighbour cells.

Proposal 4: (RRC-2)For serving cell SSB index based solution, signalling the associated SSB index per SMTC is supported.

Proposal 5: (RRC-new1)To support configuring 6 SMTCs and 2 SMTC periodicities for DL CE UE, introduce a new SMTC list instead of extend legacy smtc4list.

* To support SMTC enhancements for DL CE UE, introduce a new SMTC list instead of extending legacy smtc4list (can consider signalling optimizations for the new list to refer to the content of smtc4list to avoid signalling duplications)

Proposal 6: (RRC-new2)For connected mode, the maximum number of configured SMTCs remains 4 without extending.

Proposal 7: (RRC-new2)Legacy coarse location report can be reused to assist network to configure SMTC in connected mode. RAN2 can further discuss whether to enhance coarse location report with rougher accuracy granularity to address user consent concern if any.

* Idle/inactive open issues

Proposal 8: (idle/inactive-1)For cell selection criterion, support configuring different set of q-RxLevMin, Qrxlevminoffsetcell, q-QualMin, Qqualminoffsetcell for legacy UE and DL CE UE.

* Continue in offline 304

Proposal 9: (idle/inactive-1)For cell reselection criterion, support configuring different q-OffsetCell for legacy UE and DL CE UE.

* Continue in offline 304

Proposal 10: (idle/inactive-1)For idle/inactive mode measurement, support configuring different s-IntraSearchP, s-IntraSearchQ, s-NonIntraSearchP, s-NonIntraSearchQ, s-SearchThresholdP, s-SearchThresholdP2, s-SearchThresholdQ, s-SearchThresholdQ2 for legacy UE and DL CE UE.

* Continue in offline 304

[R2-2504312](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504312%20Multiple%20SMTCs.docx) Discussion on beam hopping with multiple SMTC offsets Qualcomm Incorporated discussion Rel-19 NR\_NTN\_Ph3-Core

Proposal 1 Existing signaling ssb-PeriodicityServingCell in serving cell common configuration is sufficient to indicate the default SSB periodicity of a cell.

Proposal 2 Introduce location-based SMTC selection procedure.

Proposal 3 Each SMTC can be associated with a reference location of the intended neighbor beams that need to be measured by the UE.

* We introduce a location-based SMTC selection procedure where each SMTC can be associated with a reference location of the intended neighbor cells that need to be measured by the UE. FFS if also an SSB-index based SMTC selection is supported

Proposal 4 The UE chooses 4 SMTCs based on the shortest distances from UE’s location to reference locations and perform RRM measurements using existing procedure as if smtc4list-r17 is configured.

Proposal 5 The legacy UEs use smtc4list-r17 and new capable UEs ignore smtc4list-r17. For new capable UEs (i.e., UEs supporting location-based SMTC), new list is introduced to include PCI list, offset and associated reference location for each SMTC.

[R2-2503926](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503926%20Open%20issues%20for%20DL%20coverage%20enhancements.docx) Discussion on NTN downlink coverage enhancement Nokia, Nokia Shanghai Bell discussion NR\_NTN\_Ph3-Core

Observation 1: RRM requirements are not applicable in case more than 2 SMTCs are configured.

Proposal 1: SMTC4 is the fallback in case SMTC5 is not supported by the UE similarly as SMTC1 is fallback in case the UE does not support SMTC4.

Proposal 2: RAN2 to discuss how to restrics the UE freedom when legacy SSB and SMTC is configured in order to prepare for RAN4 reply that such prioritisation is needed for the solution to be acceptable.

Observation 2: The relevant information for configuring the UE to measure neighbor cells that are active in a scattered manner in the same or different satellites are: periodicity and time offset.

Proposal 3: gNB may provide the neighbor cells SSB periodicities and time offsets in relation to the serving cell SSB in addition or as a replacement to the location.

Proposal 4: In case both location based and the coordinated procedure is adopted, RAN2 to discuss whether the assistance information type indicated is used to determine the network configuration.

Proposal 5: Location assistance information should consist of a center and a radius of a number of circles, each referring to one of the SMTCs in the new list.

Proposal 6: Only 6 additional SMTCs are needed.

[R2-2504400](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504400-Analysis%20on%20DL%20coverage%20enhancements%20due%20to%20extended%20SSB%20periodicity.docx) Analysis on DL coverage enhancements due to extended SSB periodicity CMCC discussion Rel-19 NR\_NTN\_Ph3-Core

Observation 6: There are two cases in cell re-selection scenario:

* Case 1: Neighboring cells supporting DL CE and normal cells are deployed in different carriers
* Case 2: Neighboring cells supporting DL CE and normal cells are deployed in co-channel manner

Proposal 7: For case 1, the UEs not supporting DL CE can realize de-prioritizing re-selection to cells operating with DL CE via legacy frequency priority.

* Continue in offline 304

Proposal 8: For case 2, to avoid the complexity and inter-cell interference of the introducing the cell-specific priority, keeping the frequency-specific priority is preferred. Conversely, the existing IntraFreqExcludedCellList IE can be utilized to enable the UEs not supporting DL CE to avoid the performance of the detection for PSS/SSS of cell with DL CE to reduce the amount of unnecessary coherent detection and UE power.

* Continue in offline 304

Agreements:

1. the maximum configured SMTCs per frequency for idle/inactive UEs is 6 (can come back if we find and issue)

2. To support SMTC enhancements for DL CE UE, introduce a new SMTC list instead of extending legacy smtc4list (can consider signalling optimizations for the new list to refer to the content of smtc4list to avoid signalling duplications)

3. We introduce a location-based SMTC selection procedure where each SMTC can be associated with a reference location of the intended neighbor cells that need to be measured by the UE. FFS if also an SSB-index based SMTC selection is supported

4. No enhancement for cell selection/reselection for DL CE is pursued (can re-discuss this if we will finally introduce a new barring scheme)

Working Assumption:

1. We introduce a mechanism to assist the NW to configure the SMTCs in connected mode, according to one of the following 2 options:

 Alt 1: UE provide the closest N reference locations/neighbor cells to network.

 Alt 2: UE reports the selected SMTCs from configured SMTC set to network.

 We continue in the next meeting on whether to confirm the WA (and go for either Alt1 or Alt2) or whether we don’t introduce any enhancement (i.e. not confirm the WA)

* [AT130][304][R19 NR NTN] DL CE (Xiaomi)

 Scope: continue the discussion on further details for the WA and on possible cell re-selection enhancements (e.g. considering the proposals in [R2-2503495](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503495%20Discussion%20on%20DL%20coverage%20enhancement.doc) and [R2-2504400](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504400-Analysis%20on%20DL%20coverage%20enhancements%20due%20to%20extended%20SSB%20periodicity.docx))

 Intended outcome: summary of the offline discussion

 Offline time: Wednesday 2025-05-21 afternoon coffee break in BO1

 Deadline for offline discussion summary (in R2-2504775): Thursday 2025-05-22 08:00

[R2-2504775](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504775.zip) Report of [AT130][304][R19 NR NTN] DL CE Xiaomi discussion NR\_NTN\_Ph3-Core

Proposal 1: Under the WA to introduce a mechanism to assist the NW to configure the SMTCs in connected mode, RAN2 further down selects from the following 2 options:

- Alt 1: UE provide the closest N reference locations/neighbor cells to network.

- Alt 2: UE reports the selected SMTCs from configured SMTC set to network.

- Xiaomi and Samsung thinks the NW could configure STMCs (up to 4) using legacy mechanism, including event D2 reports. Vivo/Oppo agree

- HW thinks there should be a possibility for the NW to do things right at the very beginning and not rely on a later report from the UEs. Ericsson/ZTE agree

- CSCN supports p1.

* We continue in the next meeting on whether to confirm the WA (and go for either Alt1 or Alt2) or whether we don’t introduce any enhancement (i.e. not confirm the WA)

Proposal 2: No enhancement for cell selection/reselection for DL CE is pursued.

* No enhancement for cell selection/reselection for DL CE is pursued (can re-discuss this if we will finally introduce a new barring scheme)

[R2-2503352](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503352%20Further%20Discussion%20on%20DL%20Coverage%20in%20NTN.docx) Further Discussion on DL Coverage in NTN vivo discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503458](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503458%20Discussion%20on%20downlink%20coverage%20enhancements.docx) Discussion on downlink coverage enhancements CATT discussion

[R2-2503459](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503459%20Discussion%20on%20the%20need%20of%20cell%20%28re%29selection%20enhancement%20for%20DL%20CE.docx) Discussion on the need of cell (re)selection enhancement for DL CE CATT discussion

[R2-2503559](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503559%20Discussions%20on%20downlink%20coverage%20enhancement.doc) Discussions on downlink coverage enhancement Fujitsu discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503671](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503671_The%20consideration%20of%20location%20based%20SMTC%20in%20NR%20NTN.doc) The consideration of location based SMTC in NR NTN China Telecom discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503884](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503884%20Discussion%20on%20NR%20NTN%20DL%20Coverage%20Enh.docx) Discussion on NR NTN downlink coverage enhancements DENSO CORPORATION discussion NR\_NTN\_Ph3-Core

[R2-2503905](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503905%20On%20DL-CE%20aspects%20for%20NR%20NTN.docx) Further considerations on NR NTN DL-CE Lenovo discussion Rel-19

[R2-2503943](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503943%20Discussion%20on%20DL%20coverage%20enhancements.docx) Discussion on DL coverage enhancements Huawei, HiSilicon, Turkcell discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503958](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503958_NTN_SMTC.docx) Discussions on the assistance information for supporting location-based SMTC selection ITRI discussion NR\_NTN\_Ph3-Core

[R2-2504006](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504006%20Discussion%20on%20DL%20coverage%20enhancement%20for%20NTN.doc) Discussion on DL coverage enhancement for NTN OPPO discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504010](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504010_Remaining%20issues%20on%20DL%20CE%20in%20NR%20NTN.docx) Remaining issues on DL CE in NR NTN ETRI discussion NR\_NTN\_Ph3-Core

[R2-2504035](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504035.docx) Details on SMTC enhancement NEC discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504057](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504057.docx) SMTC impacts due to NTN downlink coverage enhancements Sony discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504079](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504079%20Consideration%20on%20DL%20Coverage%20enhancement.doc) Consideration on downlink coverage enhancements ZTE Corporation, Sanechips discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504172](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504172_DL%20coverage%20enhancement.doc) DL coverage enhancement in NTN Apple discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504178](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504178%20%28R19%20NR%20NTN%20WI%20AI%208.8.2%29%20DL%20coverage.docx) Downlink coverage enhancement for NTN InterDigital Washington DC discussion Rel-19

[R2-2504207](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504207%20DL%20CE%20v2.docx) Open issues on Downlink Coverage Enhancement Samsung discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504357](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504357-Discussion_on_DL_coverage_enhancement.docx) Discussion on Downlink Coverage Enhancements Sharp discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504506](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504506%20Further%20consideration%20on%20downlink%20coverage%20enhancements.docx) Further consideration on downlink coverage enhancements NERCDTV discussion Rel-19

[R2-2504595](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504595%20Discussion%20on%20downlink%20coverage%20enhancement.docx) Discussion on downlink coverage enhancement LG Electronics Inc. discussion Rel-19

[R2-2504653](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504653%20-%20DL%20coverage%20enhancements.docx) DL coverage enhancements Ericsson discussion Rel-19 NR\_NTN\_Ph3-Core

### 8.8.3 Uplink Capacity/Throughput Enhancement

Contributions can be submitted on the possible RAN2 aspects of the agreements reached in RAN1.

[R2-2504183](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504183%20%28R19%20NR%20NTN%20WI%20AI%208.8.3%29%20UL%20capacity%20throughput%20enhancement.docx) Discussion on Uplink Capacity/Throughput Enhancement for NTN InterDigital Washington DC discussion Rel-19

Proposal 1: RAN2 assumes;

1. For DG PUSCH and CG PUSCH type 2, OCC length and OCC index won’t be configured by RRC; and

2. For CG type 1, OCC length and OCC index are configured by RRC.

- ZTE thinks that RAN1 agreed that for the first point RRC will provide the OCC length

- Ericsson thinks we should wait for RAN1 LS

* We wait for RAN1

Proposal 2: RAN2 define separate UE capabilities for OCC length 2 and OCC length 4, where UE capability for OCC length 2 is a prerequisite for UE capability for OCC length 4.

- HW thinks we could agree. Ericsson thinks we should wait for RAN1

* We wait for RAN1

[R2-2504352](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504352%20On%20RAN2%20aspects%20of%20uplink%20OCC.docx) On RAN2 aspects for Uplink OCC Samsung discussion Rel-19 NR\_NTN\_Ph3-Core

Observation 1: Applying OCC for RACH-less handovers can make the handovers more efficient.

Proposal 2: RAN2 to confirm OCC is applicable for RACH-less handovers.

- vivo thinks this is up to RAN1 to decide

- QC thinks this is applicable and there is no need to ask RAN1. CATT agrees and we can leave this to NW configuration

* Can come back to see whether we need to clarify anything for this in the specs

[R2-2504080](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504080%20Consideration%20on%20UL%20capacity%20enhancement.doc) Consideration on uplink capacity enhancements ZTE Corporation, Sanechips discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504276](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504276%20Discussion%20on%20Uplink%20Capacity%20Enhancements.docx) Discussion on Uplink Capacity Enhancements Huawei, HiSilicon, Turkcell discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504391](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504391%20Discussion%20on%20uplink%20capacity%20and%20throughput%20enhancement%20for%20NR%20NTN.docx) Discussion on uplink capacity/throughput enhancement for NR NTN CMCC discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504511](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504511%20Discussion%20on%20UL%20Capacity%20and%20Throughput%20Enhancement.docx) Discussion on UL Capacity and Throughput Enhancement Nokia, Nokia Shanghai Bell discussion Rel-19 NR\_NTN\_Ph3-Core

### 8.8.4 Support of Broadcast service

Contributions should address the signaling of the intended service area of a broadcast service.

[R2-2504173](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504173_MBS%20over%20NTN_v1.doc) Discussion on broadcast service continuity over NTN Apple, Lenovo, ZTE Corporation, Sanechips, Samsung, Huawei, HiSilicon discussion Rel-19 NR\_NTN\_Ph3-Core

Observation 1: UE cannot acquire accurate association between intended service area and frequencies when multiple frequencies have different intended service areas for one broadcast service, therefore UE may prioritize a frequency which does not broadcast the interested service at the UE location (which is within the intended service area illuminated by another frequency).

Observation 2: There is no issue observed on how RAN node maps the intended service area and FSAI(s).

Observation 3: Whether to support service continuity with extra signaling overhead is fully up to network implementation.

Proposal 1: The targeting scenarios for service continuity with intended service area considered comprise of multiple frequencies served by either the same or different satellites, where broadcast services are transmitted on either single or multiple frequencies.

Proposal 2: To assist UE to acquire the association between intended service area and frequencies, the intended service areas illuminated by each frequency is provided for FSAI(s) in SIB21.

- Ericsson thinks that this would trigger additional work in RAN3

[R2-2503460](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503460%20Further%20discussion%20on%20support%20of%20broadcast%20service%20in%20NR%20NTN.docx) Further discussion on support of broadcast service in NR NTN CATT discussion

Observation 1: If service areas were to be introduced specifically for FSAI in SIB21, they should be provided per FSAI and per MBS session. This brings excessively huge signalling overhead for the system information, and the signalling design is unacceptable due to the SI size limitation concern.

Observation 2: It was agreed that the intended service area for an MBS session may include geographic areas within neighbour cell(s). If the UE is still within the service area and the reselected cell is within the neighbour cell list provided in MCCH, the UE can consider the neighbour cell providing this MBS session.

Proposal 1: Do not introduce service area information specific for FSAI in SIB21.

* Agreed
* RAN2 assumes that the ISA can be valid for all the frequencies providing the MBS session

Proposal 1a: Information in existing SIB21 and USD in the current Specs is already sufficient for the UE to determine the frequency(ies) associated with the intended service area and perform the frequency (de)prioritization operations as agreed in RAN2#129bis.

Proposal 2: Do not introduce service area per neighbour cell in MCCH.

* Agreed

Proposal 2a: In addition to the neighbour cell list provided in MCCH, it can be left to UE implementation whether/how the UE considers the intended service area configured in MCCH for the MBS session, when the UE determines whether the reselected cell is providing its interested MBS session at its location. RAN2 discusses whether any informative text is needed in the Spec.

[R2-2504063](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504063.doc) Discussion on the remaining issues for the intended service area Xiaomi discussion Rel-19 NR\_NTN\_Ph3-Core

* Service continuity

Observation 1: The ISAs for an MBS session in MCCH are only for the frequency that is broadcasting the MBS session of the serving cell.

Observation 2: The UE can’t acquire the ISA for an MBS session that is broadcasting in the neighboring cells if the MBS session is not being broadcast in the serving cell.

Observation 3: The UE needs the ISAs of an MBS service broadcasted by the neighboring cells to determine the priority of the frequency that provides the MBS service if the MBS service is not being broadcasted by the serving cell.

Observation 4: The ISAs for the same MBS service may be different for different cells since the core network may provide different ISAs for an MBS service for different gNBs, considering the different locations of the gNBs (satellites).

Proposal 1: (RRC-Service continuity) The serving cell should provide the mapping between ISAs and MBS services of neighboring cells in the MCCH.

* Area specific SIB

Observation 5: Broadcasting only ISAs that are within the coverage of the serving cell will lead to frequent system information updates for the earth moving cell.

Observation 6: Broadcasting ISAs that are outside the coverage of the serving cell will avoid frequent system information updates for the earth moving cell.

Proposal 2: (Area specific SIB) The serving cell can broadcast the ISAs that are outside the coverage of the serving cell, and this is up to network implementation.

Proposal 3: (Area specific SIB) The new SIB for carrying the ISAs should be area-specific SIB.

[R2-2504081](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504081%20Consideration%20on%20broadcast%20service%20enhancements.doc) Consideration on broadcast service ehancements ZTE Corporation, Sanechips discussion Rel-19 NR\_NTN\_Ph3-Core

Proposal 1: A list of area identities can be included per FSAIs in SIB21, where each area identity identifies an intended service area in the new SIB.

Proposal 2: RAN2 understands the new SIBxx can include ISA(s) of additional MBS service provided in neighbor frequency, which is up to NW implementation (no spec impacts).

Proposal 3: The new SIBxx containing MBS ISA(s) can be cell or area specific, which is up to NW implementation (No specs change).

* The new SIBxx containing MBS ISA(s) can be cell or area specific, which is up to NW implementation (No specs change).

[R2-2503560](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503560%20Discussions%20on%20supporting%20broadcast%20service.doc) Discussions on supporting broadcast service Fujitsu discussion Rel-19 NR\_NTN\_Ph3-Core

Observation 1: Behaviours with respect to the initiation of MII procedure upon entering or leaving the area of broadcast service has already been defined.

Proposal 1: RAN2 to confirm that, with respect to the MBS service, the term ‘broadcast service area’ refers to the ‘intended service area’. It could be captured in Stage 2 specification.

* Come back in the next meeting

Proposal 2: The UE follows legacy specification to initiate MII procedure when it enters or leaves MBS intended service area.

Proposal 3: ISA(s) of MBS service provided via FSAI frequencies other than the MBS services provided by serving cell should be indicated to the UE, either via USD or the new SIB signalled by serving cell.

Agreements:

1. Do not introduce service area information specific for FSAI in SIB21.

2. Do not introduce service area per neighbour cell in MCCH

3. RAN2 assumes that the ISA can be valid for all the frequencies providing the MBS session

4. The new SIBxx containing MBS ISA(s) can be cell or area specific, which is up to NW implementation (No specs change).

[R2-2503353](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503353%20Remaining%20Issues%20on%20MBS%20Broadcast%20Provision%20in%20NTN.docx) Remaining Issues on MBS Broadcast Provision in NTN vivo discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503672](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503672_The%20signaling%20design%20of%20service%20area%20for%20PWS.doc) The signaling design of service area for PWS China Telecom discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503748](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503748_Remaining%20issues%20on%20the%20support%20of%20broadcast%20service%20in%20NTN.docx) Remaining issues on the support of broadcast service in NTN ETRI discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503749](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503749%20Discussion%20on%20providing%20MBS%20service%20area%20in%20NTN%20network.docx) Discussion on providing MBS service area in NTN network OPPO discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2503906](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503906%20Some%20remaining%20issues%20for%20MBS%20broadcast%20in%20NR%20NTN.docx) Some remaining issues for MBS broadcast in NR NTN Lenovo discussion Rel-19

[R2-2503907](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503907%20Further%20considerations%20on%20ETWS%20support%20in%20NR%20NTN%20%28Revision%20of%20R2-2502354%29.docx) Further considerations on ETWS support in NR NTN Lenovo discussion Rel-19

[R2-2504134](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504134%20Open%20issues%20for%20MBS%20in%20Rel-19%20NR%20NTN.docx) Open issues for MBS in Rel-19 NR NTN Nokia, Nokia Shanghai Bell discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504147](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504147%20Discussion%20on%20MBS%20broadcast%20over%20NTN.docx) Discussion on MBS broadcast over NTN Huawei, HiSilicon, Turkcell discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504201](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504201.docx) Remaining issues for MBS service continuity over NTN Continental Automotive discussion

[R2-2504208](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504208%20BC%20service%20area%20v2.docx) Open issues on Broadcast service area Samsung discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504311](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504311%20MBS%20broadcast%20in%20NTN.docx) MBS broadcast service continuity Qualcomm Incorporated discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504356](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504356-NTN_MBS_ISA.docx) Remaining issues on intended service area Sharp discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504392](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504392%20Considerations%20on%20broadcast%20service%20for%20NR%20NTN.docx) Considerations on broadcast service for NR NTN CMCC discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504421](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504421.docx) Discussion on Supporting of MBS Broadcast Service TCL discussion

[R2-2504477](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504477%20Discussion%20on%20the%20support%20of%20broadcast%20service.docx) Discussion on the support of broadcast service HONOR discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504529](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504529%20-%20Discussion%20on%20support%20for%20broadcast%20service%20in%20NTN.docx) Discussion on support for broadcast service in NTN LG Electronics Inc. discussion

[R2-2504652](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504652%20-%20Support%20for%20broadcast%20services%20in%20NR%20NTN.docx) Support for broadcast services in NR NTN Ericsson discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504662](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504662%20-%20MBS%20signalling%20details%20in%20NR%20NTN.docx) MBS signalling details in NR NTN Ericsson discussion Rel-19 NR\_NTN\_Ph3-Core

### 8.8.5 Support of regenerative payload

Contributions, if any, should focus on the needed updates for Stage 2 description and on whether any other existing essential features (not considered so far) would be affected - and potentially need any modifications - in a regenerative payload architecture.

[R2-2504033](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504033.docx) Stage 2 updates for regenerative payload NEC discussion Rel-19 NR\_NTN\_Ph3-Core

Proposal 1: clarify UE supports mobility between gNBs operating with transparent and regenerative NTN payloads in section 16.14.3.2

Proposal 2: clarify in section 16.14.3.2.3 that satellite switch with re-synchronization is only for transparent mode

[R2-2503986](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503986%208.8.5%20Regenerative%20payload%20-%20NTN%20Ph3.docx) Regenerative payload for NTN for NR Ph3 TOYOTA ITC discussion

[R2-2504058](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504058.docx) Satellite switch with re-sync in regenerative payload Sony discussion Rel-19 NR\_NTN\_Ph3-Core

[R2-2504064](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504064.doc) Discussion on the t-service for the regenerative payload Xiaomi discussion Rel-19 NR\_NTN\_Ph3-Core

### 8.8.6 LTE to NR NTN mobility

Contributions, if any, should focus on any possible missing aspects for the support of idle mode mobility between LTE and NR NTN.

[R2-2504007](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504007%20Discussion%20on%20dedicated%20priority%20via%20RRCConnectionRelease.doc) Discussion on dedicated priority via RRCConnectionRelease OPPO discussion Rel-19 NR\_NTN\_Ph3-Core

Proposal 1 Similar to redirection, include the satellite ID information within the FreqPriorityNR IE to help UE know whether it should prioritize the NR NTN cells or NR TN cells.

* Can come back in the next meeting

[R2-2503673](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503673_NTN%20mobility%20redirection%20signalling%20design.doc) NTN mobility redirection signalling design China Telecom discussion Rel-19 NR\_NTN\_Ph3-Core

## 8.9 IoT NTN Ph3

(IoT\_NTN\_Ph3-Core; leading WG: RAN2; REL-19; WID: [RP-243278](file:///C%3A%5CData%5C3GPP%5Carchive%5CRAN%5CRAN%23106%5CTdocs%5CRP-243278.zip))

Time budget: 1 TU

Tdoc Limitation: 3 tdocs

### 8.9.1 Organizational

LS, Rapporteur input, including workplan, running CRs, open issues lists, etc.

Rapporteur inputs do not count towards the tdoc limitation.

Incoming LSs

[R2-2503306](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503306_C4-251432.docx) Reply LS on maximum warning message size (C4-251432; contact: CICT Mobile) CT4 LS in Rel-19 IoT\_NTN\_Ph3-Core To:RAN2 Cc:CT1, SA2, RAN3

* Noted

[R2-2504888](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504888.zip) Reply LS to LS on stage 1 requirements for the support for PWS over satellite NGRAN in Rel-17 (S1-252393; contact: Ericsson) SA1 LS in Rel-19 5GSAT To:CT1, RAN3 Cc:SA2, CT4, RAN2

* Noted

Outgoing LSs:

* [AT130][305][R19 IoT NTN] LS to RAN1 on CB-msg3-EDT (Huawei)

 Scope: draft LS to RAN1 on RAN2 decisions related CB-msg3-EDT

 Intended outcome: draft LS

 Deadline for companies’ feedback: Thursday 2025-05-22 20:00

 Deadline for draft LS (in R2-2504776): Friday 2025-05-23 08:00

[R2-2504776](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504776.zip) LS on CB-msg3-EDT Huawei LS out Rel-19 IoT\_NTN\_Ph3-Core To:RAN1

* Approved

Running CRs and lists of open issues

[R2-2504646](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504646%20-%2036300_%28Rel-19%29%20-%20Draft%20Introduction%20of%20IoT%20NTN%20phase%203.docx) Draft Introduction of IoT NTN phase 3 Ericsson draftCR Rel-19 36.300 18.4.0 B IoT\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504068](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504068%20RRC%20Runing%20CR%20for%20IoT%20NTN.docx) RRC Running CR for IoT NTN Huawei, HiSilicon draftCR Rel-19 36.331 18.5.0 B IoT\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504069](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504069%20RRC%20open%20issues%20list%20for%20IoT%20NTN.docx) RRC open issue list for IoT NTN Huawei, HiSilicon discussion Rel-19 IoT\_NTN\_Ph3-Core

Proposal 1: (RRC-1) RAN2 to further discuss which of the following options to choose for indicating the transition time from normal mode to S&F mode:

Option 1: (5/9) It is up to NW implementation to set the legacy t-Service as the transition time from normal mode to S&F mode.

Option 2: (5/9) Using the agreed time information in SIB31 for both directions of transition. UE determines which direction it is based on whether the S&F indication is present.

- MTK thinks we should not change the meaning of a legacy indication

- Nokia thinks we should have an independent indication for S&F

* We don’t reuse the legacy t-Service to indicate the transition time from normal mode to S&F mode for R19 UEs

Proposal 2: (RRC-2) RAN2 to further discuss whether to introduce the following assistance information for the neighbour cells:

- (5/9) Operation mode.

- (3/9) Mode transition time

Proposal 3: (RRC-4) RAN2 to further discuss whether to reduce the paging monitoring for an S&F UE to save power consumption.

Proposal 4: (RRC-5) RAN2 to further discuss whether to allow the UE to skip reading SIB1-NB to shorten the latency of PWS acquisition.

Proposal 5: (RRC-6) RAN2 to further discuss whether to allow UE to receive and assemble PWS segments from different cells during mobility.

Proposal 6: (RRC-7) RAN2 to further discuss whether to differentiate CB-Msg3 EDT for CP solution and UP solution in the procedure.

Proposal 7: (RRC-8) RAN2 to further discuss whether to model CB-Msg3 EDT as one sub-category of legacy EDT or as a separate concept in a separate section.

Agreements:

1. We don’t reuse the legacy t-Service to indicate the transition time from normal mode to S&F mode for R19 UEs

[R2-2504525](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504525%20MAC%20Running%20CR%20for%20R19%20IoT%20NTN.docx) MAC Running CR for Rel-19 IoT NTN MediaTek Inc. draftCR Rel-19 36.321 18.4.0 B IoT\_NTN\_Ph3-Core R2-2502768

* Endorsed as a baseline

[R2-2504526](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504526%20IoT%20NTN%20MAC%20Open%20issues.docx) Remaining MAC open issues in IoT NTN MediaTek Inc. discussion Rel-19 IoT\_NTN\_Ph3-Core

[Proposals for easy agreement]

Proposal 1 (7/8): The maximum TBS could be different for different CE levels.

- Ericsson thinks we could have just one TBS and hopes that if we have different TBSs in different CE levels we don’t go for a complicated solution

* Agreed

Proposal 3 (9/9): For NB-IoT, the configurations of CB-Msg3-EDT for non-anchor carriers are put in the ul-ConfigList of SIB22-NB.

Alt-1 (Original): The CB-Msg3-EDT configuration is configured per carrier (including anchor and non-anchor carrier). Within each carrier, the CB-Msg3-EDT could be configured per CE level.

Alt-2 (E///): The CB-Msg3-EDT configuration is configured per CE level. Within each CE level, there is a pointer to the anchor carrier or one of the non-anchor carriers, indicating that the configuration of this CE level is only use in that carrier. At most 3 carriers could be configured with CB-MSG3-EDT configuration.

- QC supports option1. HW thinks the current RRC running CR is already aligned to option1. Nokia/Xiaomi also support option1

* The CB-Msg3-EDT configuration is configured per carrier (including anchor and non-anchor carrier). Within each carrier, the CB-Msg3-EDT could be configured per CE level

Proposal 5 (9/9): Revise the agreement that, due to only CE mode A is supported for eMTC NTN, only 1 separate RSRP thresholds and 2 CE levels can be supported.

* Agreed

[Proposals for discussion]

Proposal 2: For NB-IoT, RAN2 to discuss the mapping of NPUSCH resource to enhanced coverage levels.

• Alt-1 (as legacy RACH): enhanced coverage levels are numbered from 0 and the mapping of PRACH resources to enhanced coverage levels are done in increasing [number of repetition] order.

• Alt-2: The mapping of NPUSCH resource to enhanced coverage levels is configured in ASN.1 directly.

- MTK thinks Alt2 would be easier.

- QC thinks Alt1 is aligned to what we have today

* Regarding the mapping of NPUSCH resource to enhanced coverage levels, enhanced coverage levels are numbered from 0 and the mapping of NPUSCH resources to enhanced coverage levels are done in increasing [number of repetition] order (as legacy RACH)

Proposal 4: For NB-IoT, when multiple carriers provide CB-Msg3-EDT resources for the same enhanced coverage level, RAN2 to select one of below two alternatives:

• Alt-1 (7/11): (as legacy RACH): the NB-IoT UE selects the carrier based on the probabilities of each carrier. A new probability parameter for anchor carrier is introduced in SIB22-NB. The remaining probability is evenly split among the non-anchor carriers.

• Alt-2 (4/11): (up to implementation): it is up to UE implementation to select any of the carriers.

- Ericsson thinks we could have just one carrier.

- Aalyria thinks we could live this to UE implementation

- QC thinks we should go for Alt1

* For NB-IoT, when multiple carriers provide CB-Msg3-EDT resources for the same enhanced coverage level, the NB-IoT UE selects the carrier based on the probabilities of each carrier. A new probability parameter for anchor carrier is introduced in SIB22-NB. The remaining probability is evenly split among the non-anchor carriers.

Proposal 6: When max re-attempt number for current CE level has been reached, RAN2 to discuss whether the UE should be in next CE level.

- MTK suggests that we don’t support moving to the next CE level. Nokia, Huawei and CATT agree.

* When max re-attempt number for current CE level has been reached, the UE does not move to the next CE level (FFS on the details of the failure behaviour)

[Proposal for open issue]

Proposal 7: RAN2 to discuss below open issues for CB-Msg3-EDT procedure.

• MAC-2: CB-RNTI calculation

• MAC-7: Whether the HARQ operation is applicable to transmit CB-Msg3.

• MAC-9: Whether NW/UE processing time is needed when determine the Msg4 monitoring starts.

• MAC-10: FFS it will also be possible for the NW to configure that the Msg4 monitoring window starts in the subframe containing the last (N)PUSCH repetition of the first replica plus UE-eNB RTT.

• MAC-11: Whether a CB-Msg4 without RRC message is allowed as the complete response to the CB-Msg3 in CP solution.

• MAC-12: FFS how the multiplexing is organized for CB-MSG4.

* To be initially discussed in offline 301

• MAC-13: FFS new MAC PDU format for CB-Msg4

* To be initially discussed in offline 301

• MAC-14: FFS for the detail of HARQ operation on CB-Msg4.

* To be initially discussed in offline 301

• MAC-15: What should be the UE behavior (e.g. the can initiate the legacy 4-step RA) when the CB-Msg3 procedure fails.

• MAC-17: Whether to allow multiple TBSs as in EDT.

• MAC-18: How to model the CB-Msg3 response window (i.e. MSG4 monitoring window) ? Should it be a timer as in legacy RA response window, and what should be the value range.

* [AT130][301][R19 IoT NTN] CB-msg4 design (Mediatek)

 Scope: discuss open issues MAC-12, MAC-13, MAC-14

 Intended outcome: summary of the offline discussion

 Offline time: Monday 2025-05-19 afternoon coffee break in BO3

 Deadline for offline discussion summary: Tuesday 2025-05-20 11:00

 Scope: discuss remaining two proposals for CB-msg4 design marked CB Friday

 Intended outcome: summary of the offline discussion

 Offline time: Thursday 2025-05-22 16:00-16:30 in BO3

 Deadline for offline discussion summary (in R2-2504778): Friday 2025-05-23 08:00

[R2-2504762](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504762.zip) Report of [AT130][301][R19 IoT NTN] CB-msg4 design Mediatek discussion IoT\_NTN\_Ph3-Core

* Easy

Proposal 1: (MAC-12) Multiple contention resolution IDs could be included in CB-MSG4, the information related to the UE can be assembled in the MAC PDU.

* Multiple contention resolution IDs could be included in CB-MSG4, the information related to multiple UEs can be multiplexed in the MAC PDU.

Proposal 2: (MAC-12) The number of Msg3 replies in one Msg4 can be left to eNB implementation. Expect no SPEC impact.

* Agreed

Proposal 3: (MAC-14) The HARQ feedback resource information can be included in the CB-Msg4 together with contention resolution ID which identity the specific UE. RAN2 could revisit this proposal if RAN1 has some concern.

* Agreed

Proposal 5: (MAC-14) Whether to send the HARQ feedback for CB-Msg4 can be controlled by NW. UE does not send HARQ NACK.FFS whether the HARQ feedback field should always present.

* Whether to send the HARQ feedback for CB-Msg4 can be controlled by NW. UE does not send HARQ NACK.

Proposal 6: (MAC-14) For NB-IoT, the SubCarrierSpacing of the HARQ feedback for CB-Msg4 is same as the CB-Msg3.

* Agreed

Proposal 7: (MAC-14) Reuse the existing format of HARQ ACK allocation signalling in the DCI. There is 2-bit HARQ ACK resource for eMTC and 4-bit HARQ ACK resource for NB-IoT. Reuse the meaning of DCI field in R1 SPEC. Send LS to RAN1 for information on all RAN2 decisions related to HARQ feedback

* Agreed
* Potential easy

Proposal 8: Introduce a new MAC PDU for CB-Msg4 including new types of MAC sub-header and a new type of MAC payload without introducing new types of MAC CE.

* Introduce a new MAC PDU for CB-Msg4 including new types of MAC sub-header and a new type of MAC payload

Proposal 9: (MAC-13) The MAC PDU for CB-Msg4 is consist of sub-header(s) follow by MAC payload and optional padding if needed. FFS whether contention resolution ID is put in sub-header or payload.

* The MAC PDU for CB-Msg4 consists of sub-header(s) followed by MAC payload and optional padding if needed.

Proposal 10: (MAC-13) Introduce a new CB BI MAC sub-header in CB-MSg4 for backoff parameter. There is 4 bits BI for backoff indication.

* Agreed

Need more discussion

Proposal 11: (MAC-13) Introduce a new CB-Msg3 Response (CBR) MAC sub-header in CB-Msg4. It has 1bit E for sub-header/payload indication, 2 bits T for sub-header type, 1bit T2 for HARQ ACK resource present, 1 bit T3 for TAC present, 1 bit T4 for C-RNTI present and 2bit R for reservation.

- HW thinks there could be an alternative but can accept to go for the rapporteur’s proposal

- Samsung thinks we can put the CBR in the sub-header. Ericsson supports Samsung proposal.

- Xiaomi thinks this needs a bit more discussion

- Nokia supports this proposal

- QC thinks MAC sub-header should be fixed. Also thinks the retransmission should be FFS

- ZTE can accept p11

* Agreed

Proposal 12: (MAC-13) Introduce a new CB Data MAC sub-header in CB-MSg4 for MAC SDU for logical channel data. It has 1 bit E for sub-header/payload indication, 2 bits T for sub-header type, 5 bits LCID, 8 bits L for MAC SDU length.

Proposal 14: (MAC-13) The TAC is used in the in the CB-Msg3 response. RAN2 assume the length of the TAC field is 6 bits. We can revisit this if there is major R1 impact on TA calculation.

- IDC wonders what TAC is use for in case of the CP solution

- vivo wonders if 6 bits are for the absolute or relative value and suggests to use 11bits to avoid the need to involve RAN1. Nokia agrees. Xiaomi thinks we don’t need to involve RAN1

- MTK thinks we can check with RAN1

- Samsung thinks we could clarify that NTA=0

* The TAC is optionally used in the CB-Msg3 response.
* RAN2 assumes that NTA=0 for initial CB-msg3 transmission. Include this in the LS to RAN1 and RAN4
* RAN2 assumes the length of the TAC field is 6 bits (we can revisit this if there is major R1 impact on TA calculation)

Additional proposal from R2-2504528 (MTK) which was not included in offline 301:

Proposal 13c: (MAC-13) New CB-Msg3 Response (CBR). It has 48 bits contention resolution ID, 2 bits HARQ ACK resource offset for eMTC, 4 bits HARQ-ACK resource for NB-IoT, 6 bits TAC, 16 bits C-RNTI.

[R2-2504778](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504778.zip) Report of [AT130][301][R19 IoT NTN] CB-msg4 design – second round Mediatek discussion IoT\_NTN\_Ph3-Core

Proposal 1: (MAC-13) Introduce a new CB Data MAC sub-header in CB-MSg4 for MAC SDU for logical channel data. It has 1 bit E for subhead/payload indication, 2 bits T for subhead type, 5 bits LCID, 7 bits or 15 bits L for MAC SDU length, 1 bit F for 15 bits L indication. There is one L field per CB Data sub-header except for the last sub-header.



- QC wonders if bit F is always present

* Agreed

Proposal 2: (MAC-13) introduce a new CB-Msg3 Response (CBR) with variable length. It has 48-bit contention resolution ID, optional HARQ ACK, optional TAC, optional 16-bit C-RNTI.



Figure 5 CBR for NB-IoT

****

Figure 6 CBR for eMTC

- Samsung wonders whether this implies the need to introduce many formats/figures in MAC spec

- Ericsson thinks we can simply indicate what the overall length would be for the different cases

* Agreed

Proposal 3: The field names and sub-header names in above agreements could be further changed during MAC running CR review.

Agreements:

9. Introduce a new MAC PDU for CB-Msg4 including new types of MAC sub-header and a new type of MAC payload

10. The MAC PDU for CB-Msg4 consists of sub-header(s) followed by MAC payload and optional padding if needed.

11. Introduce a new CB BI MAC sub-header in CB-MSg4 for backoff parameter. There is 4 bits BI for backoff indication.

12. Introduce a new CB-Msg3 Response (CBR) MAC sub-header in CB-Msg4. It has 1bit E for sub-header/payload indication, 2 bits T for sub-header type, 1bit T2 for HARQ ACK resource present, 1 bit T3 for TAC present, 1 bit T4 for C-RNTI present and 2bit R for reservation.

* Agreed

Proposal 4: The TP in Appendix is endorsed as baseline for further MAC running CR discussion.

* The TP in Appendix is considered as baseline for further MAC running CR discussion but we can continue the discussion on the details (e.g. for T field)

Agreements:

1. The maximum TBS could be different for different CE levels.

2. Due to only CE mode A is supported for eMTC NTN, only 1 separate RSRP thresholds and 2 CE levels are supported (revised agreement)

3. Multiple contention resolution IDs could be included in CB-MSG4, the information related to multiple UEs can be multiplexed in the MAC PDU.

4. The number of Msg3 replies in one Msg4 can be left to eNB implementation. Expect no SPEC impact.

5. The HARQ feedback resource information can be included in the CB-Msg4 together with contention resolution ID which identity the specific UE. RAN2 could revisit this proposal if RAN1 has some concern.

6. Whether to send the HARQ feedback for CB-Msg4 can be controlled by NW. UE does not send HARQ NACK.

7. For NB-IoT, the SubCarrierSpacing of the HARQ feedback for CB-Msg4 is same as the CB-Msg3.

8. Reuse the existing format of HARQ ACK allocation signalling in the DCI. There is 2-bit HARQ ACK resource for eMTC and 4-bit HARQ ACK resource for NB-IoT. Reuse the meaning of DCI field in R1 SPEC. Send LS to RAN1 for information on all RAN2 decisions related to HARQ feedback

9. Introduce a new MAC PDU for CB-Msg4 including new types of MAC sub-header and a new type of MAC payload

10. The MAC PDU for CB-Msg4 consists of sub-header(s) followed by MAC payload and optional padding if needed.

11. Introduce a new CB BI MAC sub-header in CB-MSg4 for backoff parameter. There is 4 bits BI for backoff indication.

12. Introduce a new CB-Msg3 Response (CBR) MAC sub-header in CB-Msg4. It has 1bit E for sub-header/payload indication, 2 bits T for sub-header type, 1bit T2 for HARQ ACK resource present, 1 bit T3 for TAC present, 1 bit T4 for C-RNTI present and 2bit R for reservation (the field names and sub-header names in above agreements could be further changed during MAC running CR review)

Agreements – part 2:

1. The CB-Msg3-EDT configuration is configured per carrier (including anchor and non-anchor carrier). Within each carrier, the CB-Msg3-EDT could be configured per CE level

2. Regarding the mapping of NPUSCH resource to enhanced coverage levels, enhanced coverage levels are numbered from 0 and the mapping of NPUSCH resources to enhanced coverage levels are done in increasing [number of repetition] order (as legacy RACH)

3. For NB-IoT, when multiple carriers provide CB-Msg3-EDT resources for the same enhanced coverage level, the NB-IoT UE selects the carrier based on the probabilities of each carrier. A new probability parameter for anchor carrier is introduced in SIB22-NB. The remaining probability is evenly split among the non-anchor carriers.

4. When max re-attempt number for current CE level has been reached, the UE does not move to the next CE level (FFS on the details of the failure behaviour)

5. The TAC is optionally used in the CB-Msg3 response.

6. RAN2 assumes that NTA=0 for initial CB-msg3 transmission. Include this in the LS to RAN1 and RAN4

7. RAN2 assumes the length of the TAC field is 6 bits (we can revisit this if there is major R1 impact on TA calculation)

Agreements – part 3:

1. Introduce a new CB Data MAC sub-header in CB-MSg4 for MAC SDU for logical channel data. It has 1 bit E for subhead/payload indication, 2 bits T for subhead type, 5 bits LCID, 7 bits or 15 bits L for MAC SDU length, 1 bit F for 15 bits L indication. There is one L field per CB Data sub-header except for the last sub-header.

2. Introduce a new CB-Msg3 Response (CBR) with variable length. It has 48-bit contention resolution ID, optional HARQ ACK, optional TAC, optional 16-bit C-RNTI.

[R2-2504149](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504149-Running-CR-TS36304.docx) Running CR for TS36.304 for IoT-NTN Nokia Solutions & Networks (I) draftCR Rel-19 36.304 18.3.0 B IoT\_NTN\_Ph3-Core

* Endorsed as a baseline

[R2-2504140](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504140%20open%20issues%20list%20for%20IoT%20NTN-Idle-mode.docx) Remaining Open Issues for idle mode operation for IoT-NTN (TS 36.304) Nokia,Nokia Shanghai Bells discussion

Issue 1: Acceptable camping for NB-IoT for ETWS/PWS reception

Observation 1: Support of acceptable cell camping requires additional UE functionality over the capability for PWS/ETWS reception from suitable cells.

Observation 2: The additional power consumption for idle mode operation without emergency call (only for ETWS reception) support needs to be justified.

Proposal 1: RAN2 to discuss and conclude whether ETWS/PWS/CMAS reception for NB-IoT can be limited only to suitable cells.

Issue 2: Emergency call support in SF operation

Proposal 2: RAN2 to down-select any of the following option related to emergency call support in SF mode operation.

O1:Specification text can indicate that emergency calls are not supported when cell is operating in store and forward mode

O2:It is upto SA2 to clarify the support for IMS services and emergency services for SF operation. EN can be removed and updated if needed based on SA2 specification status.

[R2-2504321](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504321%20Rel-19%2036306%20Running%20CR.docx) UE capability Running CR for Rel-19 IoT NTN Qualcomm Inc. CR Rel-19 36.306 18.4.0 1912 - B IoT\_NTN\_Ph3-Core

* Endorsed as a baseline

Other

[R2-2504631](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504631%20Discussion%20k-mac%20IoT%20NTN.docx) Discussion to align IoT NTN k-Mac with IoT NTN TDD k-Mac THALES

### 8.9.2 Support of Store & Forward

Contributions should focus on possible impacts to the radio interface.

[R2-2503798](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503798%20Open%20issues%20on%20the%20S%26F%20mode%20transition%20time.docx) Open issues on the S&F mode transition time Google discussion Rel-19 IoT\_NTN\_Ph3-Core

Observation 1 (RRC-1) If t-Service is used to indicate when the S&F mode will start, S&F-capable UEs could trigger the neighbor cell measurement and cell reselection too early, resulting in unnecessary UE power consumption.

Observation 2 (RRC-1) Legacy UEs will still remain in the serving cell after t-Service, even if t-Service is used to indicate when the S&F mode will start.

Observation 3 (RRC-1) The best way to direct legacy UEs to other normal-mode cells is to rely on the legacy barring bit.

Proposal 1 (RRC-1) When the S&F operation indication is present, the agreed time information in SIB31 (i.e., t-ModeSwitching) indicates when the normal mode will start; otherwise, the agreed time information in SIB31 (i.e., t-ModeSwitching) indicates when the S&F mode will start.

* Agreed

Proposal 2 UE AS can utilize the transition time from the normal mode to S&F mode to determine: 1) when to trigger the neighbor cell measurement, and 2) whether to establish/reestablish/resume an RRC connection.

Proposal 3 (RRC-2) To prioritize the cells operating in normal mode during the cell reselection, a list of cells not operating in the S&F mode can be provided in the system information.

- Xiaomi agrees with the intention but thinks this would be a dynamic indication triggering frequent updates. Samsung agrees and thinks we could just provide the information on whether neighbour cell support S&F functionality. Nordic/Toyota agrees with Samsung.

- CATT/Ericsson/HW think we could include the operation mode in the neighbour cell list.

- Nokia thinks we don’t need to optimize cell reselection for this

- Apple thinks we should include the transition time rather than the operation mode. ZTE/IDC agrees. In any case IDC wonders about the specific UE behaviour when receiving this indication. HW thinks the transition time alone does not work, we still need the current operation mode.

- vivo thinks we should not support this optimization. MTK agrees. Oppo agrees it would be difficult for the UE to use this information

- Honor has some concerns with including the transition time

- Apple/IDC wonders how any new indication would impact the cell re-selection procedure

* WA: In the neighbour cell list we introduce an indication whether the cell operates in S&F mode or not (FFS if we also include the transition time). This WA can only be confirmed if we converge on the corresponding UE behaviour.

[R2-2503499](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503499%20Remaining%20issues%20for%20S%26F%20operation%20in%20IoT%20NTN.docx) Remaining issues for S&F operation in IoT NTN ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_Ph3-Core

Proposal 1: It’s suggested NOT to use the agreed time information in SIB31, t-ModeSwitching for transition from S&F mode to Normal mode, for both directions of transition. It’s easy to cause confusion if let UE determine which direction it is based on whether the S&F indication is present.

Proposal 2a: The agreed time information on transition from Normal mode to S&F operation mode (e.g., t-ModeSwitchingNtoSF) can be defined based on another agreed time information on transition from S&F operation mode to Normal mode (t-ModeSwitchingSFtoN) and with a new parameter of “duration of Normal mode”, as below:

t-ModeSwitchingNtoSF = t-ModeSwitchingSFtoN + duration of Normal mode

Proposal 2b: It’s suggested to introduce a new parameter “duration of Normal mode” which is in units of millisecond or seconds.

Proposal 3a: For quasi-earth fixed cell, it can be up to network’s implementation to set the t-Service in SystemInformationBlockType3(-NB) the time when the serving satellite starts to operate in S&F mode or the time when the serving satellite stops serving the area.

Proposal 3b: The earth moving cell case can be further discussed based on the progress for quasi-earth fixed cell case.

Proposal 4a: For quasi-earth fixed cell, it can be up to network’s implementation to set the t-ServiceStartNeigh in SystemInformationBlockType33(-NB) or t-ServiceStart in SystemInformationBlockType32(-NB) either the time when the neighbor satellite starts to operate in Normal mode or the time when the neighbor satellite starts serving the area.

Proposal 4b: The earth moving cell case can be further discussed based on the progress for quasi-earth fixed cell case.

Proposal 4c: It’s suggested to introduce a new time information when a neighbor satellite transits from S&F operation mode to Normal mode for each neighbor satellite in SystemInformationBlockType33(-NB).

[R2-2504617](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504617%20-%20%E2%80%9CS%26F%20Monitoring%20List%E2%80%9D%20and%20%E2%80%9CS%26F%20Wait%20Timer%E2%80%9D%20and%20potential%20RAN2%20impacts_v02.docx) Discussion on “S&F Monitoring List” and “S&F Wait Timer” and potential RAN2 impacts Sateliot, Thales, Novamint discussion

* Cell (re)selection enhancements

Observation 5: If a UE has received a “S&F Wait Timer” and/or a “S&F Monitoring List” from a MME operating in S&F mode, the UE is not expected to perform a NAS procedure:

• Condition A: In any satellite operating in S&F mode of the same PLMN, as long as the S&F Wait Timer is running.

• Condition B: In a satellite operating in S&F mode of the same PLMN which is not included in the S&F Monitoring List.

Proposal 1: Enhance the definition of suitable cell in 36.304 so that a UE may consider a detected cell as unsuitable and not treating it as a candidate for reselection, if the detected cell is handled by a satellite operating in S&F mode for which conditions (A) and/or (B) are met.

- Nokia thinks we already agreed not to have impacts to AS. Ericsson agrees

- Apple thinks this is too much. QC/IDC agree

- Google supports this for condition B (while condition A is too complicated). CATT agrees. HW also thinks condition B should be considered. Xiaomi sees some benefit to consider condition B but thinks this implies that the operation mode of neighbour cell should be provided

- Samsung thinks that changing the definition would also imply that we bar the cell. IDC agrees

* Can come back to this
* Relaxation of idle mode tasks

Observation 5: A UE that has received a “S&F Wait Timer” and/or a “S&F Monitoring List” from a satellite operating in S&F mode is not prevented from searching other suitable cells and, if found, accessing them whenever conditions (A) and/or (B) are respected.

Observation 6: As per SA2 specs: “NOTE 5: When the S&F Wait Timer is running, the power consumption optimization behaviours, if any, are left for UE implementation e.g. whether to listen to paging or deactivate its Access Stratum functions”.

Observation 7: If satellites operating in S&F mode also exhibit discontinuous coverage, existing mechanisms to handle discontinuous coverage can be leveraged (e.g. SIB32, t-service, relaxation of idle mode tasks when UE is out of coverage, etc.).

Proposal 2: In a S&F network deployment which also exhibits discontinuous coverage, existing mechanisms to handle discontinuous coverage can be leveraged (e.g. satellite assistance information, UE not needing to perform idle mode tasks when the UE determines that is out of coverage, etc.). There is no need to modify existing discontinuous coverage features due to the addition of S&F Satellite operation.

- CATT wonders if this is entirely correct

- Ericsson agrees with the intention

- Sasmung thinks we can simply clarify in discontinuous coverage procedure in idle mode that the UE takes into account the information about NAS configured S&F monitoring list.

- MTK agrees with the intention

* In a S&F network deployment which also exhibits discontinuous coverage, existing mechanisms to handle discontinuous coverage can be leveraged (e.g. satellite assistance information, UE not needing to perform idle mode tasks when the UE determines that is out of coverage, etc.). There is no need to modify existing discontinuous coverage features due to the addition of S&F Satellite operation. FFS if we clarify in discontinuous coverage procedure in idle mode that the UE also takes into account the information about NAS configured S&F monitoring list.

Proposal 3: Potential relaxation of idle mode tasks, if any, when “S&F Wait Timer” and/or “S&F Monitoring List” are set in the UE by upper layers is left for UE implementation. (For example, if the UE is out of coverage because of discontinuous coverage and the UE determines that next coverage window is going to be provided by satellite operating in S&F mode that it’s not included in the “S&F Monitoring List”, the UE may skip such coverage window).

* Relating Satellite ID in SIBs and in “S&F Monitoring List”

Observation 8: Current specs include different definitions and uses of satellite identifiers (“satelliteId-r17”, “satelliteId-r18”) in different SIBs (SIB31/32/33/3/5). Relation, if any, between the use of these identifiers is not explicitly stated. How the UE is expected to determine a single/unique satellite identifier for the serving satellite that can be used in the “S&F Monitored List” could be open to different interpretations.

Proposal 4: RAN2 to clarify in the specs that the values used in “satelliteId-r17” within SIB32 are expected to correspond to the values used in “satelliteId-r18” in other SIBs (e.g. the value used to identify the serving satellite in SIB32 and SIB31 should be the same) and which is the correspondence between the “satelliteId” IE and “S&F Monitoring List”.

- Ericsson agrees with the intention but thinks we should have a description in Stage2

- CATT thinks the part before the last and should be agreeable

* Clarify in Stage 2 from Rel-18 (so in general, not only for S&F) that the values used in “satelliteId-r17” are expected to correspond to the values used in “satelliteId-r18” in other SIBs (e.g. the value used to identify the serving satellite in SIB33, SIB32 and SIB31 should be the same). Come back in the next meeting with an actual Rel-18 CR for this. FFS if in Rel-19 we need to say anything about the correspondence between the “satelliteId” IE and “S&F Monitoring List”.

Agreements:

1. When the S&F operation indication is present, the agreed time information in SIB31 (i.e., t-ModeSwitching) indicates when the normal mode will start; otherwise, the agreed time information in SIB31 (i.e., t-ModeSwitching) indicates when the S&F mode will start.

2. In a S&F network deployment which also exhibits discontinuous coverage, existing mechanisms to handle discontinuous coverage can be leveraged (e.g. satellite assistance information, UE not needing to perform idle mode tasks when the UE determines that is out of coverage, etc.). There is no need to modify existing discontinuous coverage features due to the addition of S&F Satellite operation. FFS if we clarify in discontinuous coverage procedure in idle mode that the UE also takes into account the information about NAS configured S&F monitoring list.

3. Clarify in Stage 2 from Rel-18 (so in general, not only for S&F) that the values used in “satelliteId-r17” are expected to correspond to the values used in “satelliteId-r18” in other SIBs (e.g. the value used to identify the serving satellite in SIB33, SIB32 and SIB31 should be the same). Come back in the next meeting with an actual Rel-18 CR for this. FFS if in Rel-19 we need to say anything about the correspondence between the “satelliteId” IE and “S&F Monitoring List”.

Working Assumption:

1. In the neighbour cell list we introduce an indication whether the cell operates in S&F mode or not (FFS if we also include the transition time). This WA can only be confirmed if we converge on the corresponding UE behaviour.

[R2-2503346](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503346_S%26F.doc) Discussion on Store and Forward operation Xiaomi discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503354](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503354%20Further%20Discussion%20on%20S%26F%20Operation.docx) Further Discussion on S&F Operation vivo discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503496](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503496_892_Panasonic_IoT-NTN_SnF_Remaining_Open_Issues.docx) Remaining S&F Open Issues PANASONIC discussion

[R2-2503528](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503528%20-%20Discussion%20on%20Store%20%26%20Forward%20satellite%20operation.docx) Discussion on Store & Forward satellite operation OPPO discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503598](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503598.docx) Discussion on Store & Forward satellite operation TCL discussion

[R2-2503674](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503674_Remaining%20issues%20for%20IoT%20NTN%20S%26F.doc) Remaining issues for IoT NTN S&F China Telecom discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503768](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503768%20Discussion%20on%20Store%20and%20Forward.docx) Discussion on Store & Forward operation DENSO CORPORATION discussion IoT\_NTN\_Ph3-Core

[R2-2503908](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503908%20Mode%20transition%20time%20for%20S%26F%20operation%20%28Revision%20of%20R2-2502355%29.docx) Mode transition time for S&F operation Lenovo discussion Rel-19

[R2-2504034](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504034.docx) Remaining issues on S&F NEC discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504046](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504046.docx) Discussion on support of Store&Forward Transsion Holdings discussion Rel-19

[R2-2504090](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504090%20Open%20issues%20on%20Store%20and%20Forward%20operation.docx) Open issues on Store and Forward operation Samsung discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504097](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504097.docx) Discussion on Paging and Mode Switching Toyota ITC discussion Rel-19 R2-2502620

[R2-2504138](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504138-Store-Forward-RAN-Aspects.docx) On RAN2 aspects of SF Operation Nokia , Nokia Shanghai Bells discussion

[R2-2504174](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504174_Store%20and%20Forward.doc) Support of S&F operation in IoT NTN Apple discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504179](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504179%20%28R19%20IoT-NTN%20AI%208.9.2%29%20-%20Support%20of%20S%2BF.docx) Store and Forward open issues Interdigital, Inc. discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504202](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504202.docx) Further considerations on S&F operations Continental Automotive discussion

[R2-2504277](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504277%20Further%20consideration%20on%20Store%20and%20Forward.docx) Further consideration on Store and Forward Huawei, HiSilicon, Turkcell discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504317](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504317%20store%20and%20forward.docx) Switching of S&F mode Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504351](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504351.doc) CIoT UP solution for Store & Forward satellite operation SHARP Corporation discussion

[R2-2504366](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504366%20Discussion%20on%20RAN2%20impacts%20due%20to%20the%20MME-configured%20satellite%20list.docx) Discussion on RAN2 impacts due to MME-configured satellite list CATT, Google, Sateliot, Thales discussion Rel-19

[R2-2504367](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504367%20Discussion%20on%20IoT%20NTN%20Store%20and%20Forward.docx) Discussion on IoT NTN Store and Forward CMCC discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504478](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504478%20Discussion%20on%20the%20Store%20and%20Forward%20satellite%20operation.docx) Discussion on the Store and Forward satellite operation HONOR discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504497](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504497%20Discussion%20on%20time%20information%20for%20S%26F.docx) Discussion on time information for S&F ASUSTeK discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504527](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504527%20RAN2%20impact%20on%20SF%20mode.docx) RAN2 impact on S&F mode MediaTek Inc. discussion IoT\_NTN\_Ph3-Core R2-2502769

[R2-2504550](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504550.docx) Remaining issues on Store and Forward satellite operation ETRI, Korea University discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504654](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504654%20-%20Support%20for%20store%20and%20forward%20in%20IoT%20NTN.docx) Support for store and forward in IoT NTN Ericsson discussion Rel-19 IoT\_NTN\_Ph3-Core

### 8.9.3 Uplink Capacity Enhancement

Contributions should focus on the possible enhancements to reduce the necessary uplink and downlink signaling to complete an EDT transaction (Msg3 transmission without msg1/RAR; efficient delivery of msg4 / RRCEarlyDataComplete).

[R2-2504528](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504528%20Discussion%20on%20CB-Msg3-EDT.docx) Discussion on CB-Msg3 procedure MediaTek Inc. discussion IoT\_NTN\_Ph3-Core R2-2502771

Proposal 2a: (MAC-7) HARQ process 0 is used to transmit CB-Msg3.

- QC thinks p2a is sufficient

* HARQ process 0 is used to transmit all the CB-Msg3 replicas in the transmission window (RV0 is used to transmit the first repetition of each CB-Msg3 replica in the transmission window)

Proposal 2b: (MAC-7) HARQ feedback is not used for CB-Msg3 transmission.

Proposal 3: (MAC-9) A 3ms processing time is added when the Msg4 monitoring starts

(other suggested values in other contributions are 0ms or 4ms)

- QC wonders if RAN1 will specify this

Proposal 4: (MAC-10) RAN2 does not specify another way of starting Msg4 monitoring window.

- ZTE would still like to consider the alternative solution.

- Xiaomi thinks we should only have a single solution. Samsung agrees. ESA/Apple/CATT also agree

* We do not specify another way of starting Msg4 monitoring window

Proposal 5: (MAC-11) A CB-Msg4 with only contention resolution identity is allowed as the complete response to the CB-Msg3 in CP solution.

- IDC agrees with the intention but this has implications. Also IDC wonders if the NW knows when to use this or not.

- Ericsson agrees it colud be difficult fo the NW to know but there are case where this is possible

- QC supports the proposal

* A CB-Msg4 without RRC message (but with contention resolution identity) is allowed as the complete response to the CB-Msg3 in CP solution.

Proposal 15: (MAC-17) RAN2 postpones the discussion on multiple TBSs in CB-Msg3-EDT.

*Proposal 16: (MAC-18) A CB-Msg3 contention resolution timer is used to model the CB-Msg3 response window (similar to legacy mac-ContentionResolutionTimer). The network should be able to configure the length of the CB-Msg3 response window longer than the length of legacy contention resolution window.*

[R2-2504645](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504645%20-%20UL%20capacity%20enhancements%20for%20IoT%20NTN.docx) UL capacity enhancements for IoT NTN Ericsson discussion Rel-19 IoT\_NTN\_Ph3-Core

Proposal 2 RAN2 deprioritize work on CB-Msg3-EDT for eMTC in release 19.

- IDC wonder if we also for it only for NB-IoT CP solution

* RAN2 thinks that in case this proposal should be discussed at RAN plenary level

Proposal 5 One single CB-RNTI, configured in SIB, is used by all UEs for scrambling Msg3 and for monitoring for Msg4.

Some alternative options from other contributions:

|  |
| --- |
| From [R2-2503500](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503500%20Remaining%20issues%20for%20CB-msg3-EDT%20in%20IoT%20NTN.docx):CB-RNTI = 1 + floor(SFN\_id/A) + [C\*(H-SFN mod B)]SFN\_id is the index of the radio frame of the first time-domain transmission occasion within the transmission windowH-SFN is the index of the hyper frame of the first time-domain transmission occasion within the selected transmission window.A is determined by the minimum periodicity of the CB-msg3 transmission window in units of radio frame (e.g., 10ms). B is determined by the maximum length of CB-msg4 monitoring window in units of H-SFN duration. C is determined by the maximum value of floor(SFN\_id/A)+1From [R2-2503662](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503662%20Further%20discussion%20on%20UL%20capacity%20enhancement%20for%20IoT%20NTN.docx): |
| RNTI=X + Msg3\_W\_index mod (ceil (Msg4\_WS/Msg3\_WP)) + ceil (Msg4\_WS/Msg3\_WP)\*carrier\_id, wherein:X is the starting RNTI for Msg4 reception, which can be defined by RAN2 e.g. X=1 or any other value,Msg3\_W\_index is the index of Msg3 transmission window within a periodicity of 1024 SFNs and index 0 corresponds to the Msg3 transmission window starts at the SFN defined by IE startSFN-r19.Msg4\_WS is the window size of Msg4,Msg3\_WP: is the transmission window periodicity of Msg3.From [R2-2504318](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504318%20EDT%20enh.docx): |
| eMTC: CB-RNTI = 1+ SFN\_id mod (Cmax/10)+offsetwhere SFN\_id is the index of the first radio frame of the specified CB-Msg3 window, and Cmax is the maximum possible CB-Msg4 Contention resolution window size in subframes for BL UEs or UEs in enhanced coverage. Offset is defined as the largest value that RA-RNTI can take i.e. 1+9+10\*5+60\*39NB-IoT : CB-RNTI = 1 + floor(SFN\_id/M) + (1024/M)\*carrier\_id + offsetwhere SFN\_id is the index of the first radio frame of the specified CB-Msg3 window and carrier\_id is the index of the UL carrier associated with the specified CB-Msg3. The carrier\_id of the anchor carrier is 0. M can be set to the minimum periodicity in radio frames allowed for CB-Msg3 window. Offset is defined as the largest value that RA-RNTI can take i.e. 1+255+256\*MaxNumberOfCarriers.From [R2-2504528](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504528%20Discussion%20on%20CB-Msg3-EDT.docx): |
| For eMTC, CB-RNTI = 2401+ floor(SFN\_id / Wmin) where the SFN\_id is the start SFN of the transmission window and the Wmin is the minimum value of transmission window lengthFor NB-IoT, CB-RNTI = 4097+ floor(SFN\_id / Wmin) + N\*carrier\_id where the SFN\_id is the start SFN of the transmission window, the Wmin is the minimum value of transmission window length, the carrier\_id is the index of UL carrier and the N can be the maximum value of floor(SFN\_id / Wmin). The carrier\_id of the anchor carrier is 0 |
| From [R2-2504175](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504175_Contention%20based%20MSG3.doc): |
| Proposal 2: For CB-RNTI derivation, time domain information (SFN) of the starting point of Msg3 transmission window is used. FFS on frequency domain info (depending on the decision of Msg3 transmission window).Proposal 3: Specifically for NB-IoT, carrier\_id should be also considered for CB-RNTI derivation.From [R2-2503355](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503355%20Discussion%20on%20CB-Msg3%20Mechanism.docx): |
| CB-RNTI: the subframe timing index of the last valid CB-msg3 occasion within the transmission window; the frequency resource index associated with that last valid CB-msg3 occasion; the maximum length of msg4 windowFrom [R2-2503461](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503461%20Discussion%20on%20open%20issues%20for%20CB-Msg3%20EDT.docx) / [R2-2503529](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503529-%20Discussion%20on%20CB-msg3%20EDT%20and%20msg4%20enhancement.docx): |
| The CB-RNTI is preconfigured or predefined |

- Oppo thinks that if the monitoring window is short enough we can avoid ths risk of overlapping windows

- Nokia thinks the NW should have the flexibility to have longer windows and then the windows could overlap

- HW thinks we can reuse existing formulas for the calculation

- QC thinks we need to ensure that CB-RNTI and RA-RNTI do not collide

* We continue the discussion on a solution for CB-RNTI in offline 306, ensuring that there is no collision between CB-RNTI and RA-RNTI.

Proposal 6 Power ramping for CB-Msg3-EDT is not considered in release 19.

- vivo thinks we should wait for RAN1

Proposal 7 RAN2 do not work on OCC for CB-Msg3-EDT in release 19.

- QC does not support the proposal and thinks that OCC could be supported without additional work for RAN2 (procedure wise, only the corresponding configuration is needed)

- Ericsson doubts that OCC would work in this case. Nokia agrees

- Toyota thinks that from RAN2 perspective there is no problem to support OCC

* We continue the discussion on OCC for CB-msg3-EDT in the next meeting.

(failure handling)

Proposal 19 If the UE does not receive a Msg4, with a UE contention resolution ID MAC CE that match the Msg3 that the UE sent, within the Msg4 window after the UEs last CB-Msg3 uplink transmission (including any CB-Msg3 reattempt and possible stepping of CE level), the UE shall consider the CB-Msg3-EDT procedure as unsuccessful.

Proposal 20 If MAC layer has determined that the CB-Msg3-EDT procedure is either successful or unsuccessful, the MAC layer shall inform the higher layers. FFS how/when RRC layers determines (un)successful CB-Msg3-EDT procedure.

Proposal 21 If CB-Msg3-EDT procedure is unsuccessful, it is up to UE implementation whether to trigger further actions (for example, trigger EDT using the random access procedure or trigger PUR transmission or trigger another CB-Msg3-EDT procedure or inform NAS of unsuccessful EDT).

Agreements:

1. HARQ process 0 is used to transmit all the CB-Msg3 replicas in the transmission window (RV0 is used to transmit the first repetition of each CB-Msg3 replica in the transmission window)

2. We do not specify another way of starting Msg4 monitoring window, i.e. it is confirmed that the Msg4 monitoring window always starts at the end of CB-Msg3-EDT transmission window plus UE-eNB RTT (FFS NW/UE processing time is needed or not)

3. A CB-Msg4 without RRC message (but with contention resolution identity) is allowed as the complete response to the CB-Msg3 in CP solution.

* [AT130][306][R19 IoT NTN] CB-RNTI (Ericsson)

 Scope: discuss the solution for CB-RNTI

 Intended outcome: summary of the offline discussion

 Offline time: Thursday 2025-05-22 afternoon coffee break (location FFS)

 Deadline for offline discussion summary (in R2-2504777): Friday 2025-05-23 08:00

[R2-2504777](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2504777.zip) Report of [AT130][306][R19 IoT NTN] CB-RNTI Ericsson discussion IoT\_NTN\_Ph3-Core

Proposal 1: RAN2 to discuss below formula for deriving RNTI for Msg4 monitoring.

RNTI=X + varying\_RNTI\*[Msg3\_W\_index modulo (Y) + Y\*CE\_level + 3\*Y\*carrier\_id]

wherein:

• X is the starting RNTI for Msg4 reception, which can be defined by RAN2 e.g. X=2401 for eMTC or 4097 for NB-IoT,

• varying\_RNTI is configured by the NW, e.g., 1 for varying RNTI and 0 for one fixed RNTI

• Msg3\_W\_index is the index of Msg3 transmission window within a periodicity of 1024 SFNs and index 0 corresponds to the Msg3 transmission window starts at the SFN defined by IE startSFN-r19,

• Y is ceil (Msg4\_WS/Msg3\_WP),

• Msg4\_WS is the window size of Msg4,

• Msg3\_WP is the transmission window periodicity of Msg3,

• CE\_level is the CE level, 0 <= CE\_level < 3

• carrier\_id is the index of the UL carrier of the CB-Msg3 resources, anchor carrier has index 0,

0 <= carrier\_id < 16

* WA: the formula for RNTI for mMsg4 monitoring is:

RNTI=X + Msg3\_W\_index modulo (Y) + Y\*CE\_level + 3\*Y\*carrier\_id.

• X is the starting RNTI for Msg4 reception, which can be defined by RAN2 e.g. X=2401 for eMTC or 4097 for NB-IoT,

• Msg3\_W\_index is the index of Msg3 transmission window within a periodicity of 1024 SFNs and index 0 corresponds to the Msg3 transmission window starts at the SFN defined by IE startSFN-r19,

• Y is ceil (Msg4\_WS/Msg3\_WP),

• CE\_level is the CE level, 0 <= CE\_level < 3

• carrier\_id is the index of the UL carrier of the CB-Msg3 resources, anchor carrier has index 0,

0 <= carrier\_id < 16

Can come back to check if the NW can also simply configure RNTI = X

Proposal 2: the value of X is 4097 for NB-IoT

* The value of X is 4097 for NB-IoT and 2401 for eMTC

Proposal 3: the value of Msg4\_WS is the maximum Msg4 window size

- Nokia wonders whether we need the maximum Msg4 window size

* the value of Msg4\_WS is the maximum Msg4 window size
* the value of Msg3\_WP is the minimum Msg3 window periodicity

Proposal 4: RAN2 discuss which of these needs further studies:

• number of input variables,

• msg3 window start time,

• msg3 window length,

• msg3 window periodicity,

• carrier\_id,

• msg4 window length

• what values to use for X

• CE-level

• eMTC parameters

• Other parameters?

Working Assumption:

The formula for RNTI for mMsg4 monitoring is:

RNTI=X + Msg3\_W\_index modulo (Y) + Y\*CE\_level + 3\*Y\*carrier\_id.

• X is the starting RNTI for Msg4 reception, which can be defined by RAN2 e.g. X=2401 for eMTC or 4097 for NB-IoT,

• Msg3\_W\_index is the index of Msg3 transmission window within a periodicity of 1024 SFNs and index 0 corresponds to the Msg3 transmission window starts at the SFN defined by IE startSFN-r19,

• Y is ceil (Msg4\_WS/Msg3\_WP),

• CE\_level is the CE level, 0 <= CE\_level < 3

• carrier\_id is the index of the UL carrier of the CB-Msg3 resources, anchor carrier has index 0,

0 <= carrier\_id < 16

Can come back to check if the NW can also simply configure RNTI = X

Agreements – part 2:

1. The value of X is 4097 for NB-IoT and 2401 for eMTC

2. The value of Msg4\_WS is the maximum Msg4 window size

3. The value of Msg3\_WP is the minimum Msg3 window periodicity

[R2-2503347](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503347_UL%20capacity%20IoT%20NTN.doc) Discussion on uplink capacity enhancements for IoT NTN Xiaomi discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503355](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503355%20Discussion%20on%20CB-Msg3%20Mechanism.docx) Further Discussion on CB-msg3-EDT Mechanism vivo discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503461](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503461%20Discussion%20on%20open%20issues%20for%20CB-Msg3%20EDT.docx) Discussion on open issues for CB-Msg3 EDT CATT discussion

[R2-2503500](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503500%20Remaining%20issues%20for%20CB-msg3-EDT%20in%20IoT%20NTN.docx) Remaining issues for CB-msg3-EDT in IoT NTN ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503529](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503529-%20Discussion%20on%20CB-msg3%20EDT%20and%20msg4%20enhancement.docx) Discussion on CB-msg3 EDT and msg4 enhancement OPPO discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503599](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503599.docx) Discussion on UL Capability Enhancement for IOT NTN TCL discussion

[R2-2503662](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503662%20Further%20discussion%20on%20UL%20capacity%20enhancement%20for%20IoT%20NTN.docx) Further discussion on UL capacity enhancement for IoT NTN Nokia, Nokia Shanghai Bell discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503675](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503675_Discussion%20of%20UL%20capacity%20in%20IoT%20NTN.doc) Discussion of UL capacity in IoT NTN China Telecom discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503880](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503880%20Discussion%20on%20UL%20Capacity%20Enhancement%20for%20IoT-NTN.docx) Discussion on UL Capacity Enhancement for IoT-NTN NEC discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503909](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503909%20EDT%20for%20uplink%20capacity%20enhancement%20in%20NTN%20%28Revision%20of%20R2-2502356%29.docx) EDT for uplink capacity enhancement in NTN Lenovo discussion Rel-19

[R2-2503959](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503959%20Remaining%20issues%20on%20CB-msg3-EDT.doc) Remaining issues on CB-msg3-EDT Spreadtrum, UNISOC discussion Rel-19

[R2-2504047](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504047.docx) Discussion on uplink capacity enhancement Transsion Holdings discussion Rel-19

[R2-2504065](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504065%20Further%20consideration%20on%20UL%20capacity%20enhancement.docx) Further consideration on UL capacity enhancement Huawei, HiSilicon, Turkcell discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504091](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504091%20On%20procedures%20and%20open%20issues%20for%20CB-Msg3-EDT.docx) On procedures and open issues for CB-Msg3-EDT Samsung discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504098](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504098.docx) Discussion on Diversity Slotted ALOHA Randomization Toyota ITC discussion Rel-19

[R2-2504175](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504175_Contention%20based%20MSG3.doc) Uplink capacity enhancement in IoT NTN Apple discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504180](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504180%20%28R19%20IoT-NTN%20AI%208.9.3%29%20-%20EDT%20enhancements.docx) CB-EDT Interdigital, Inc. discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504318](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504318%20EDT%20enh.docx) CB-Msg3-EDT and Msg4 multicast Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504338](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504338-IoT-NTN%20uplink%20capacity%20enhancement.docx) IoT-NTN uplink capacity enhancement Nordic Semiconductor ASA discussion Rel-19

[R2-2504393](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504393%20Further%20discussion%20on%20uplink%20capacity%20enhancement%20for%20IoT-NTN.docx) Further discussion on uplink capacity enhancement for IoT-NTN CMCC discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504479](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504479%20Discussion%20on%20UL%20capacity%20enhancement.docx) Discussion on UL capacity enhancement HONOR discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503478](file:///C%3A%5CData%5C3GPP%5CRAN2%5CDocs%5CR2-2503478.zip) Further discussion on CB-Msg3 and Msg-4 enhancement NTU discussion Rel-19 Late

### 8.9.4 Support of PWS

Contributions should focus on the introduction of support for broadcast of PWS messages for NB-IoT, re-using the LTE mechanisms.

[R2-2504092](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504092%20Acceptable%20cell%20camping%20for%20NB-IoT.docx) Acceptable cell camping for NB-IoT Samsung, Iridium, Vivo, Thales discussion Rel-19 IoT\_NTN\_Ph3-Core

Observation 1: In eMTC and normal LTE, a UE can camp on an acceptable cell to receive PWS broadcasting and originate emergency calls. This is a crucial part of cellular operation that users rely on daily.

Observation 2: NB-IoT did not introduce camping on any cell or an acceptable cell as emergency calls or PWS signalling was never supported.

Proposal 1: A UE shall be able to camp on an NB-IoT NTN cell for the purpose of receiving PWS broadcast, without the cell being a part of UEs PLMNs.

- HW supports the proposal. Vivo also and wonders if we can apply this to NB-IoT TN. Xiaomi agrees

- Ericsson thinks that we would need to differentiate for the case of PWS support and emergency call (which will only be supported in R20)

* A UE should be able to camp on an NB-IoT cell (at least for NTN) for the purpose of receiving PWS broadcast, without the cell being a part of UEs PLMNs. Come back in the next meeting to discuss the exact solution to make this possible (i.e. not necessarily introducing an acceptable cell category for NB-IoT)

Proposal 2: RAN2 to discuss introducing acceptable cell category for NB-IoT NTN.

[R2-2503663](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503663%20Remaining%20issues%20on%20support%20of%20PWS%20for%20NB-IoT%20NTN.docx) Remaining issues on support of PWS for NB-IoT NTN Nokia, Nokia Shanghai Bell discussion Rel-19 IoT\_NTN\_Ph3-Core

* Inter-cell PWS reception (open issue RRC-6)

Observation 1: In legacy, the PWS message segmentation feature is only supported for the intra-cell scenario.

Observation 2: In NTN, all the segments of PWS message may not be delivered to UE successfully within a single cell in moving cell scenario.

Proposal 1: Support continued reception of PWS segmentation of a message from different cells in moving cell scenario.

- Google supports this

- QC is not sure we can have this, as the NW would have to synchronize transmission and the the UE would anyway lose some segment in the transition from one cell to the other

- MTK also do not support this proposal. Vivo also thinks this would be technically difficult. Xiaomi agrees and also thinks there is no need for this in the GEO case

- HW thinks this could be doable in the intra-gNB case.

- Aalyria thinks this could be useful also in other scenarios than earth moving case and thinks this could work in all intra-satellite case. Google also thinks we could target the intra-gNB intra-satellite case only

- Nordic thinks this would be difficult to support for the UEs

* Can come back in the next meeting with an actual TP. In any case we will not target other scenarios than the intra-gNB case

Proposal 2: Introduce a new indication in SIB for inter-cell PWS segmentation reception.

Proposal 3: The segmentation size of PWS message should be exchanged via inter-node message to support inter-cell PWS reception.

* PWS Support in SF mode

Observation 3: PWS delivery when cell operates in S&F mode may have impacts on meeting delay requirements of PWS services.

Observation 4: RAN2 assumes no additional impact in supporting PWS functionality in S&F operation.

Proposal 4: Support for PWS in SF operation is decided at SA2. RAN2 to decide whether to send LS on this or wait for SA2 decision.

* WUS Efficiency Impacts for PWS Transmission

Observation 5: WUS configuration helps to minimize downlink monitoring related energy consumption for UE configured with shorter eDRX cycle.

Observation 6: Network that supports PWS and shorter eDRX cycle configuration for UE may activate WUS functionality to reduce the overall energy consumption associated with faster PWS reception.

Observation 7: When WUS is configured in NB-IoT cell, the PWS transmission may false wake-up all the UE outside the PWS service area resulting in reducing the overall efficiency of WUS benefits.

Proposal 5: RAN2 to consider PWS specific WUS configuration for improved paging efficiency for PWS related paging notification.

[R2-2503799](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503799%20Open%20issues%20on%20the%20support%20for%20PWS%20in%20NB-IoT.docx) Open issues on the support for PWS in NB-IoT Google discussion Rel-19 IoT\_NTN\_Ph3-Core

* (RRC-6) Handling of PWS segments after switching to a new cell:

Observation 1 (RRC-6) An LTE UE switching to a new cell would discard any previously buffered PWS segments, if it has not fully received a segmented PWS message in the original cell.

Observation 2 (RRC-6) Most likely, an UE in the idle mode would connect to the same eNB while moving from one NTN cell to another. Discarding previously buffered PWS segments in such instances would lead to significant inefficiencies in both resource utilization and power consumption.

Proposal 1 (RRC-6) UE is allowed to retain previously buffered PWS segments and resume PWS reception when transitioning to a new NTN cell from a previously served NTN cell.

Proposal 2 (RRC-6) If P1 is agreed, RAN2 to adopt the TP in Annex A into the current 36.331 running CR.

* (RRC-4) Inclusion of PWS area information in Paging:

Observation 3 (RRC-4) The likelihood of paging an irrelevant UE in an NTN cell for a PWS alert is very high.

Proposal 3 (RRC-4) PWS area information in coarse level can be signaled together with a PWS indication in Paging-NB. The UE not within the area determined by the PWS area information can skip acquiring the system information relevant to the PWS.

Proposal 4 (RRC-4) If P3 is agreed, RAN2 to adopt the TP in Annex B into the current 36.331 running CR.

Agreements:

1. A UE should be able to camp on an NB-IoT cell (at least for NTN) for the purpose of receiving PWS broadcast, without the cell being a part of UEs PLMNs. Come back in the next meeting to discuss the exact solution to make this possible (i.e. not necessarily introducing an acceptable cell category for NB-IoT)

2. Regarding support continued reception of PWS segmentation of a message from different cells, can come back in the next meeting with an actual TP. In any case we will not target other scenarios than the intra-gNB case

[R2-2503348](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503348_PWS%20for%20NB-IoT.doc) PWS support for NB-IoT over NTN Xiaomi discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503356](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503356%20Remaining%20Issues%20on%20PWS%20Support%20for%20NB-IoT.docx) Remaining Issues on PWS Support for NB-IoT vivo discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503501](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503501%20Remaining%20issues%20for%20PWS%20support%20in%20IoT%20NTN.docx) Remaining issues for PWS support in IoT NTN ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503503](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503503%20Support%20of%20PWS%20for%20NB-IoT.docx) Remaining issues on PWS support for NB-IoT Huawei, HiSilicon, Turkcell discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503530](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503530%20-%20Discussion%20on%20PWS%20for%20NB-IoT.docx) Discussion on PWS for NB-IoT OPPO discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503676](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503676_The%20PWS%20related%20consideration%20of%20NB-IoT%20NTN.doc) The PWS related consideration of NB-IoT NTN China Telecom discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2503910](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503910%20Further%20considerations%20on%20PWS%20broadcast%20support%20in%20IoT%20NTN%20%28Revision%20of%20R2-2502357%29.docx) Further considerations on PWS broadcast support in IoT NTN Lenovo discussion Rel-19

[R2-2504319](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504319%20PWS%20NB-IoT.docx) Discussion on PWS in NB-IoT NTN Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504362](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504362%20Remaining%20issue%20on%20support%20of%20PWS%20for%20NB-IoT%20NTN%20UE.docx) Remaining issue on support of PWS for NB-IoT NTN UE CATT discussion

[R2-2504394](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504394%20Support%20of%20PWS%20messages%20for%20NB-IoT.docx) Support of PWS messages for NB-IoT CMCC discussion Rel-19 IoT\_NTN\_Ph3-Core

[R2-2504655](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504655%20-%20Enhancements%20to%20support%20PWS%20in%20NB-IoT%20NTN.docx) Enhancements to support PWS in NB-IoT NTN Ericsson discussion Rel-19 IoT\_NTN\_Ph3-Core

## 8.17 IoT-NTN TDD mode

(IoT\_NTN\_TDD; leading WG: RAN1; REL-19; WID [RP-243293](file:///C%3A%5CData%5C3GPP%5Carchive%5CRAN%5CRAN%23106%5CTdocs%5CRP-243293.zip))

Time budget: 0.5 TU

Tdoc Limitation: 1 tdoc

CR Rapporteurs:

36.300: Iridium

36.304: Xiaomi

36.306: Samsung

36.321: Toyota

36.331: Huawei

* SI scheduling

[R2-2504633](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504633%20Discussion%20on%20IoT%20TDD_v3.docx) Discussion on support of IoT-NTN TDD mode THALES discussion Rel-17 IoT\_NTN\_TDD-Core

Proposal 1: The SI-message transmission can be postponed to the next valid D frame within the SI-Window

- ZTE and CATT support p1 and thinks there is no impact on the UE behavior

- Nordic/Iridium/Nokia/QC/HW also supports p1

* The SI-message transmission can be postponed to the next valid D frame within the SI-Window

[R2-2503350](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503350_Discussion%20on%20the%20IoT%20NTN%20TDD%20mode.doc) Discussion on support of IoT-NTN TDD mode Xiaomi discussion Rel-19 IoT\_NTN\_TDD

Proposal 2: Introduce new value with multiples of 90ms for si-Periodicity and si-WindowLength respectively.

- vivo supports p2

* SI-window overlapping

[R2-2504082](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504082%20Consideration%20on%20IoT-NTN%20TDD%20mode.docx) Consideration on IoT-NTN TDD mode ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_TDD

Proposal 9: It is up to NW implementation to avoid SI-window overlap.

- QC thinks the SI window will never overlap

* It is up to NW implementation to avoid SI-window overlap.

[R2-2504070](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504070%20Discussion%20on%20RAN2%20impacts%20of%20IoT-NTN%20TDD.docx) Discussion on RAN2 impacts of IoT-NTN TDD Huawei, HiSilicon discussion Rel-19 IoT\_NTN\_TDD

Proposal 2: For the SI reception within an SI-window, UE should prioritize the previous SI reception in case there is collision between the previous SI repetitions and the subsequent SI reception.

- HW clarifies the proposal is about repetitions within the SI window

- QC thinks that also the repetitions will not overlap

- Iridium wonders if we should rather stop the previous repetition and start with the subsequent

* SI repetitions will not overlap (in case of collision the subsequent SI repetition is postponed)
* SI repetition

[R2-2504082](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504082%20Consideration%20on%20IoT-NTN%20TDD%20mode.docx) Consideration on IoT-NTN TDD mode ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_TDD

Proposal 7: Define value range with multiple 90ms for si-RepetitionPattern, e.g. with value range of every9thRF, every18thRF, every36thRF etc.

- Iridium thinks we don’t need to introduce new range for si-RepetitionPattern

[R2-2503531](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503531%20-%20Discussion%20on%20IoT%20NTN%20TDD%20mode.docx) Discussion on IoT NTN TDD mode OPPO discussion Rel-19 IoT\_NTN\_TDD

In NTN TDD mode, for si-RepetitionPattern, only a value of every16thRF is supported.

* RACH aspects

[R2-2503689](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503689.docx) IoT-NTN TDD mode SI scheduling and UE procedures Iridium Satellite LLC discussion Rel-19 IoT\_NTN\_TDD

Proposal 10: In IoT-NTN TDD mode, The RA-RNTI should be calculated based on the SFN of the first radio frame in which the Random-Access Preamble is transmitted after the postponement, not the actual occurrence of the NPRACH opportunity.

* In IoT-NTN TDD mode, the RA-RNTI should be calculated based on the SFN of the first radio frame in which the Random-Access Preamble is transmitted (i.e. no spec change)

[R2-2504082](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504082%20Consideration%20on%20IoT-NTN%20TDD%20mode.docx) Consideration on IoT-NTN TDD mode ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_TDD

Proposal 3: For the timer of ra-ResponseWindowSize and mac-ContentionResolutionTimer, the absolute value limitation for FDD (i.e., 10.24s) is used for IoT NTN TDD.

* For the timer of ra-ResponseWindowSize and mac-ContentionResolutionTimer, the absolute value limitation for FDD (i.e., 10.24s) is used for IoT NTN TDD.

Proposal 4: For RA-RNTI calculation in IoT NTN TDD, H-SFN is considered and carrier id is not considered.
Proposal 4a: For RA-RNTI calculation in IoT NTN TDD, the NB-IoT TDD RA-RNTI calculation is used as baseline.
Proposal 5: RAN2 discusses whether to use floor (SFN\_id/4) or floor(SFN\_id/9) in RA-RNTI calculation. If floor(SFN\_id/9) is used, then RA-RNTI = 1 + floor(SFN\_id/9) + 114\*(H-SFN mod 2), otherwise RA-RNTI = 1 + floor(SFN\_id/4) + 256\*(H-SFN mod 2).

- Nordic thinks we don’t need to change anything. Xiaomi agrees

* In IoT-NTN TDD mode the same formula as for RA-RNTI calculation for FDD is reused

Proposal 6: Use the existing terminology the first radio frame of the specified PRACH and the first hyper frame of the specified PRACH for RA-RNTI calculation.

* Timer range extension

[R2-2504082](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504082%20Consideration%20on%20IoT-NTN%20TDD%20mode.docx) Consideration on IoT-NTN TDD mode ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_TDD

Proposal 1: For timer in unit of PDCCH periods, the definition in existing specs is clear enough, not need for further clarification.

Proposal 2: RAN2 assumes no extension is needed on the value range of timer in unit of ms or s for IoT NTN TDD. This assumption can be revisited if RAN1 provides the exact overage enhancement level (e.g. the maximal repetitions number) that is supported in IoT NTN TDD system.

* No extension is needed on the value range of timer in unit of ms or s for IoT NTN TDD

[R2-2504093](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504093%20On%20RAN2%20aspects%20of%20IoT%20NTN%20TDD.docx) On RAN2 aspects for IoT NTN TDD Samsung discussion Rel-19 IoT\_NTN\_TDD

Proposal 2: RAN2 agrees current value ranges of NB-IoT timers (in PDCCH periods and in absolute time) are sufficient for practical deployments for IoT NTN TDD.

[R2-2504633](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504633%20Discussion%20on%20IoT%20TDD_v3.docx) Discussion on support of IoT-NTN TDD mode THALES discussion Rel-17 IoT\_NTN\_TDD-Core

No clarification needed to take into account impact of invalid subframes on NPDCCH periods

* Paging

[R2-2504320](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504320%20NB-IoT%20TDD.docx) Discussion on new NB-IoT NTN TDD mode Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_TDD

Proposal 5 The remaining paging repetitions falling on the invalid DL SFNs are postponed to the next valid DL SFNs.

* The remaining paging repetitions falling on the invalid DL SFNs are postponed to the next valid DL SFNs.

Proposal 6 Network configures the gap between two POs (i.e., parameter NB) to be sufficiently long such that it includes enough number of valid DL subframes for NumRepetitionPaging-r13.

- ZTE thinks we should not have requirements for the NW

* It is up to network to configure the gap between two POs (i.e., parameter NB) to be sufficiently long such that it includes enough number of valid DL subframes for NumRepetitionPaging-r13 (no spec impact)

Proposal 7 When the start of the paging is postponed to the next valid DL SFN, clarify which subframe the UE should monitor the paging.

* Definitions

[R2-2503987](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503987%20IoT-NTN%20TDD%20mode.docx) Discussion on NTN IoT-NTN TDD mode TOYOTA ITC discussion

Proposal 3: Introduce the following definition for IoT-NTN TDD mode in the impacted RAN2 specifications:
IoT-NTN TDD mode: allows use of NB-IoT channels with TDD mode for NTN with fixed values of D non-overlapping usable contiguous DL subframes and set of U usable contiguous UL subframes separated by fixed guard period.

* Agreed (can revisit this based on the TP being prepared by RAN1)

[R2-2504320](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504320%20NB-IoT%20TDD.docx) Discussion on new NB-IoT NTN TDD mode Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_TDD

Proposal 1 RAN2 assume the cell with new TDD frame structure is called NB-IoT NTN TDD cell.

* UE capabilities

[R2-2503987](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503987%20IoT-NTN%20TDD%20mode.docx) Discussion on NTN IoT-NTN TDD mode TOYOTA ITC discussion

Proposal 4: In TS 36.306, all the Rel-17 and Rel-18 UE capabilities or optional features without UE capability that are applicable in NTN NB-IoT are also applicable in IoT-NTN TDD mode.

Proposal 5: Add a statement in TS 36.306 reflecting that the UE capabilities that apply in TDD do not apply in IoT-NTN TDD, unless otherwise stated.

Proposal 6: RAN2 to agree on one of the two options below for IoT-NTN TDD mode:

Option 1: UE radio access capability parameter signalled and corresponding to a field in RRC (specified in clause 4 of 36.306).

Option 2: Optional feature without UE radio access capability parameters (specified in clause 6 of 36.306).

- ESA thinks we should not preclude the possibility in the next meeting to suggest minor changes as part of the TDD Mode WI to ensure that the features discussed in the R19 IoT NTN WI are also applicable to TDD mode

* In IoT\_NTN\_Ph3-Core, RAN2 will not work on any specific enhancements to ensure that the features being specified in IoT\_NTN\_Ph3-Core will also work for IoT NTN TDD mode. RAN2 understands that, as part of the IoT\_NTN\_TDD WI, we can discuss on a case by case basis whether minor specific enhancements – not affecting other WGs - can be supported to ensure that (some of) the features being specified in IoT\_NTN\_Ph3-Core will also work for IoT NTN TDD mode
* Others

[R2-2504320](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504320%20NB-IoT%20TDD.docx) Discussion on new NB-IoT NTN TDD mode Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_TDD

Proposal 8 Introduce a new list of neighbor cells operating in TDD mode for measurements and cell reselection.

[R2-2504510](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504510%20%20Further%20discussion%20on%20support%20of%20TDD%20mode%20for%20IoT-NTN.docx) Further discussion on support of TDD mode for IoT-NTN Nokia, Nokia Shanghai Bell discussion Rel-19 IoT\_NTN\_TDD

Proposal 4: RAN2 to discuss handling of the PUR & SPS postponement including postponement to another valid UL subframe to avoid UL collision between different UEs.

Proposal 7: RAN2 to introduce a drx-Cycle value which is aligned with the 90 ms TDD frame periodicity.

[R2-2504082](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504082%20Consideration%20on%20IoT-NTN%20TDD%20mode.docx) Consideration on IoT-NTN TDD mode ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_TDD

Proposal 10: UE drops the non-DL subframes for SC-PTM reception.

[R2-2503689](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503689.docx) IoT-NTN TDD mode SI scheduling and UE procedures Iridium Satellite LLC discussion Rel-19 IoT\_NTN\_TDD

Proposal 1: When operating in IoT-NTN TDD mode, there is no need to update the SIB1 scheduling mechanism in the existing specifications, except for disabling transmissions during downlink inactive time.

Agreements:

1. The SI-message transmission can be postponed to the next valid D frame within the SI-Window

2. It is up to NW implementation to avoid SI-window overlap

3. SI repetitions will not overlap (in case of collision the subsequent SI repetition is postponed)

4. In IoT-NTN TDD mode, the RA-RNTI should be calculated based on the SFN of the first radio frame in which the Random-Access Preamble is transmitted (i.e. no spec change)

5. For the timer of ra-ResponseWindowSize and mac-ContentionResolutionTimer, the absolute value limitation for FDD (i.e., 10.24s) is used for IoT NTN TDD.

6. In IoT-NTN TDD mode the same formula as for RA-RNTI calculation for FDD is reused

7. No extension is needed on the value range of timer in unit of ms or s for IoT NTN TDD

8. The remaining paging repetitions falling on the invalid DL SFNs are postponed to the next valid DL SFNs.

9. It is up to network to configure the gap between two POs (i.e., parameter NB) to be sufficiently long such that it includes enough number of valid DL subframes for NumRepetitionPaging-r13 (no spec impact)

10. Introduce the following definition for IoT-NTN TDD mode in the impacted RAN2 specifications:
IoT-NTN TDD mode: allows use of NB-IoT channels with TDD mode for NTN with fixed values of D non-overlapping usable contiguous DL subframes and set of U usable contiguous UL subframes separated by fixed guard period (can revisit this based on the TP being prepared by RAN1)

11. In Rel19, RAN2 will not work on any specific enhancements to ensure that the features being specified in IoT\_NTN\_Ph3-Core will also work for IoT NTN TDD mode

12. In IoT\_NTN\_Ph3-Core, RAN2 will not work on any specific enhancements to ensure that the features being specified in IoT\_NTN\_Ph3-Core will also work for IoT NTN TDD mode. RAN2 understands that, as part of the IoT\_NTN\_TDD WI, we can discuss on a case by case basis whether minor specific enhancements – not affecting other WGs - can be supported to ensure that (some of) the features being specified in IoT\_NTN\_Ph3-Core will also work for IoT NTN TDD mode

[R2-2503350](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503350_Discussion%20on%20the%20IoT%20NTN%20TDD%20mode.doc) Discussion on support of IoT-NTN TDD mode Xiaomi discussion Rel-19 IoT\_NTN\_TDD

[R2-2503357](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503357%20Further%20Discussion%20on%20IoT-NTN%20TDD%20mode.docx) Further Discussion on IoT-NTN TDD mode vivo discussion Rel-19 IoT\_NTN\_TDD-Core

[R2-2503389](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503389%20SI%20transmission%20for%20IoT%20NTN%20TDD%20mode.docx) SI transmission of IoT-NTN TDD mode NEC discussion Rel-19 IoT\_NTN\_TDD

[R2-2503462](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503462%20Discussion%20on%20support%20of%20NB-IoT%20NTN%20TDD.docx) Discussion on support of NB-IoT NTN TDD CATT discussion

[R2-2503531](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503531%20-%20Discussion%20on%20IoT%20NTN%20TDD%20mode.docx) Discussion on IoT NTN TDD mode OPPO discussion Rel-19 IoT\_NTN\_TDD

[R2-2503689](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503689.docx) IoT-NTN TDD mode SI scheduling and UE procedures Iridium Satellite LLC discussion Rel-19 IoT\_NTN\_TDD

[R2-2503911](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503911%20DL%20and%20UL%20impacts%20of%20TDD%20pattern%20in%20IoT%20NTN.docx) DL and UL impacts of TDD pattern in IoT NTN Lenovo discussion Rel-19

[R2-2503987](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503987%20IoT-NTN%20TDD%20mode.docx) Discussion on NTN IoT-NTN TDD mode TOYOTA ITC discussion

[R2-2504070](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504070%20Discussion%20on%20RAN2%20impacts%20of%20IoT-NTN%20TDD.docx) Discussion on RAN2 impacts of IoT-NTN TDD Huawei, HiSilicon discussion Rel-19 IoT\_NTN\_TDD

[R2-2504082](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504082%20Consideration%20on%20IoT-NTN%20TDD%20mode.docx) Consideration on IoT-NTN TDD mode ZTE Corporation, Sanechips discussion Rel-19 IoT\_NTN\_TDD

[R2-2504093](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504093%20On%20RAN2%20aspects%20of%20IoT%20NTN%20TDD.docx) On RAN2 aspects for IoT NTN TDD Samsung discussion Rel-19 IoT\_NTN\_TDD

[R2-2504320](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504320%20NB-IoT%20TDD.docx) Discussion on new NB-IoT NTN TDD mode Qualcomm Incorporated discussion Rel-19 IoT\_NTN\_TDD

[R2-2504334](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504334-iot-ntn-tdd.docx) On SI scheduling, postponing impacts, and early implementation of the IoT-NTN TDD mode Nordic Semiconductor ASA discussion Rel-19

[R2-2504395](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504395%20Support%20of%20IoT-NTN%20TDD%20mode.docx) Support of IoT-NTN TDD mode CMCC discussion Rel-19 IoT\_NTN\_TDD

[R2-2504510](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504510%20%20Further%20discussion%20on%20support%20of%20TDD%20mode%20for%20IoT-NTN.docx) Further discussion on support of TDD mode for IoT-NTN Nokia, Nokia Shanghai Bell discussion Rel-19 IoT\_NTN\_TDD

[R2-2504633](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504633%20Discussion%20on%20IoT%20TDD_v3.docx) Discussion on support of IoT-NTN TDD mode THALES discussion Rel-17 IoT\_NTN\_TDD-Core

## 8.18 TEI19

Time budget: 1 TU

Tdoc Limitation: 1 tdoc for new proposals and 1 tdoc for old proposals.

1 additional tdoc for primary co-sourcing company on top of the limit is allowed for co-sourced contribution with 4 or more companies.

Companies are encouraged to submit co-sourced contributions, which will have priority for discussion in RAN2#129bis.

* LTE TN to NB-IoT NTN mobility

[R2-2503369](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503369_Draft%20CR_36306_Rel19_Introduction%20of%20LTE%20TN%20to%20IoT%20NTN%20Mobility%20UE%20Capability.docx) Introduction of LTE TN to NB-IoT NTN Mobility UE Capability vivo, Samsung, Google, THALES, MediaTek Inc. draftCR Rel-19 36.306 18.4.0 B TEI19 R2-2501781

- Aalyria supports the CRs and would like to co-source the final version in August

* Endorsed (to be resubmitted for RAN2 #131 with the TEI19 code for approval)

[R2-2503829](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503829%2036331CR%20for%20the%20inclusion%20of%20NB-IoT%20satellite%20information%20in%20E-UTRAN.docx) 36331CR for the inclusion of NB-IoT satellite information in E-UTRAN Google, Samsung, vivo, THALES, MediaTek Inc. draftCR Rel-19 36.331 18.5.0 B TEI19

* Endorsed (to be resubmitted for RAN2 #131 with the TEI19 code for approval)

[R2-2503832](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2503832%2036300CR%20for%20the%20inclusion%20of%20NB-IoT%20satellite%20information%20in%20E-UTRAN.docx) 36300CR for the inclusion of NB-IoT satellite information in E-UTRAN Google, Samsung, vivo, THALES, MediaTek Inc. draftCR Rel-19 36.300 18.4.0 B TEI19

* Endorsed (to be resubmitted for RAN2 #131 with the TEI19 code for approval)
* Redirection from TN to IoT NTN and NR NTN

[R2-2504094](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504094%20Redirection%20from%20TN%20to%20IoT%20NTN%20and%20NR%20NTN.docx) Redirection from TN to IoT NTN and NR NTN Samsung, Google discussion Rel-19 TEI19

Observation 1: A lot of effort have been put in mobility enhancements for NTN, but TN to NTN mobility is still not fully supported.

Observation 2: Redirection from LTE TN to NR NTN is supported in Release 19.

Observation 3: Redirection from NR TN to NR NTN cannot really be considered supported without procedural clarification and a capability in Release 19.

Observation 4: In the current IoT NTN capability framework, the UE reports capabilities according to network type, making redirection to NTN difficult.

Proposal 1: RAN2 to discuss options to support redirection to NR NTN:

Option A: UE uses the frequency received in redirectedCarrierInfo and matches it to frequencies in SIB19 to determine whether the frequency is an NTN band and its associated NTN assistance information. A new capability is introduced to support this for the NTN bands UE indicates support of.

Option B: The UE is configured with an indicator whether the frequency is NTN and and/or with NTN assistance information. A new capability is introduced to support this for the NTN bands the UE indicates support of.

Option C: The UE is configured with satellite ephemeris in the release message. This serves as an indication of NTN band and a new capability is introduced to support this for the NTN bands the UE indicates support of.

- QC supports option B

- Huawei/Nokia/CATT supports A

* RAN2 agrees to cover the needed changes to support NR TN to NR NTN redirection in Rel19 via a TEI19 change. Come back in the next meeting with a TP

Option D: The UE is configured with an indicator whether the frequency is NTN. If SIB19 is present the UE uses the frequency received in the redirection messages and matches it to the frequency in SIB1

- Ericsson thinks we already agreed to have an implicit indicator

- Apple supports at least option D, also B and C are ok

- Aalyria thinks we should consider the case where SIB19 is not present

- HW does not support option D.

- Nokia also prefers option A

Proposal 2: RAN2 to consider the text proposal in Appendix A1, B1 and C1 as baseline, depending on Option A, B or C in Proposal 1.

Proposal 3: To support TN to IoT NTN redirection, the capabilities related to redirection from TN to IoT NTN are considered TN-capabilities, and are thus signalled to the terrestrial network.

Proposal 4: The required capabilities for redirection from TN to NTN is the capability to perform the redirection as well as the supported bands.

Proposal 5: To support TN to IoT NTN redirection, the LTE TN to NR NTN solution may be reused: Release message contains a list of satellite IDs, which refers to satellite elements in SIB33.

* NR-NTN to NB-IoT NTN mobility

[R2-2504347](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504347%20NR-NTN%20to%20NB-IoT%20NTN%20mobility.docx) NR-NTN to NB-IoT NTN inter-RAT mobility EchoStar, Boost Mobile, Terrestar, Qualcomm, TTP discussion Rel-19

Proposal 1: For mobility from NB-IoT NTN to NR-NTN, RAN2 introduce a solution to provide a list of assistance information of NR-NTN carrier frequency and the NR-NTN satellite.

- HW wonders if it is a realistic scenario to support both IoT-NTN and NR-NTN

- MTK thinks that if there is a need to support this this could be left to UE implementation

- QC thinks we could limit this to cell selection.

- Nokia thinks this could be done without impacts to the UE procedures

- Ericsson thinks this is about mobility, which requires measurements and RAN4 requirements

- Nokia thinks we can do this without RAN4 requirements

- QC, Nokia, Aalyria, Echostar think that for both direction we should limit the proposal to assist cell selection, without any impacts to RAN4

* Can come in the next meeting, in case focussing the proposal (for both direction) on the provision of inter-RAT assistance information in SIB (with no impact on the procedural text)

Proposal 2: For mobility from NR-NTN to NB-IoT NTN, define a new IE ntn-NeighCellConfigList-NB-r19 in SIB19 to provide the list of NB-IoT satellite information and NB-IoT carrier information.

* ETWS geo-fencing

[R2-2504071](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2504071%20ETWS%20geo-fencing%20for%20eMTC%20NTN%20and%20for%20TN.docx) ETWS geo-fencing for eMTC NTN and for TN Huawei, HiSilicon, China Southern Power Grid, Turkcell discussion Rel-19 TEI19

Proposal 1: RAN2 to confirm that ETWS geo-fencing is supported for eMTC NTN and introduce“warning area coordinates” to SIB10 and SIB11.

- QC is ok with with p1 but not to support this in NB-IoT TN

* ETWS geo-fencing is supported for eMTC NTN and introduce“warning area coordinates” to SIB10 and SIB11 (introduce this change as part of IoT NTN Ph3 WI)
* ETWS geo-fencing is not supported any TN case

Proposal 2: RAN2 to discuss whether ETWS geo-fencing is applied to eMTC TN and LTE TN in case there is no extra spec effort.

Proposal 3: RAN2 to discuss whether ETWS geo-fencing is applied to NR TN in case there is no extra spec effort.

Agreements:

1. We cover the needed changes to support NR TN to NR NTN redirection in Rel19 via a TEI19 change. Come back in the next meeting with a TP

2. For NR-NTN to NB-IoT NTN inter-RAT mobility, can come in the next meeting, in case focussing the proposal (for both direction) on the provision of inter-RAT assistance information in SIB (with no impact on the procedural text)

3. ETWS geo-fencing is supported for eMTC NTN and introduce“warning area coordinates” to SIB10 and SIB11 (introduce this change as part of IoT NTN Ph3 WI)

4. ETWS geo-fencing is not supported any TN case

# Summary

Agreed CRs

R17 IoT NTN (LTE\_NBIOT\_eMTC\_NTN)

R17 NR NTN (NR\_NTN\_solutions-Core)

R18 IoT NTN (IoT\_NTN\_enh-Core)

R18 NR NTN (NR\_NTN\_enh-Core)

Approved LSs out

[Post130] Email discussions

Short

Long