**3GPP TSG RAN meeting #95-e RP-220XXX**

**Electronic Meeting, March 17th – March 23rd, 2022**

## Status Report to TSG

**Agenda item:** 10.4.3 NB-IoT/eMTC support for Non-Terrestrial Networks (NTN)

|  |  |
| --- | --- |
| **WI / SI Name** |  |
| included in this status report | Study Item: No | Core part: Yes | Performance part:No | Testing part:- |
| **Acronym** | LTE\_NBIOT\_eMTC\_NTN |
| **Unique ID** | 920069 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-211601 |
| **Target Completion Date****(indicate if changed)** | Study Item:  | Core part:03/2022  | Performance part:  | Testing part: - |
| **Overall Completion level** | Study Item:  | Core part: Overall: 99%For informationRAN1: 100% RAN2: 98%RAN3: 100% | Performance Part:  | Testing part: - |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN1 |
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| **Secondary WG** | RAN2 |
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| **Secondary WG** | RAN3 |
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## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

* **RAN1#108-e, February 21st – March 3rd, 2022, e-meeting**

**Agreements on “8.14.1 Enhancements to time and frequency synchronization”**

TP to TS 36.300:

**Agreement**

* For IoT NTN, capture into 36.300 a stage-2 description of concept of K\_offset, K-mac, UE pre-compensation of timing and frequency pre-compensation/adjustment for uplink transmission with modification as needed

NOTE: NR NTN agreements on TS 38.300 relating to a stage-2 description of concept of K\_offset, K-mac, UE pre-compensation of timing and frequency pre-compensation/adjustment for uplink transmission can be adopted for TS 36.300 with modification as needed and can include aspects specific to IoT NTN as needed.

R1-2202930 –DRAFT LS to RAN2 on IoT-NTN TP for TS 36.300

* Final LS in R1-2202931

R1-2202917 – RAN1 IoT NTN additions for TS 36.300

TPs to TS 36.211:

The TP below for TS 36.211 Section 8.1 is endorsed

--------------------------------------- Start of TP for 3GPP TS 36.211 ----------------------------------------

**8.1 Uplink-downlink frame timing**

<Unchanged Text Omitted>

Transmission of the uplink radio frame number  from the UE shall start $T\_{TA}=\left(N\_{TA}+N\_{TA,offset}+N\_{TA,adj}^{common}+N\_{TA,adj}^{UE}\right)T\_{s}$ seconds before the start of the corresponding downlink radio frame at the UE.



Figure 8.1-1: Uplink-downlink timing relation

<Unchanged Text Omitted>

---------------------------------------- End of TP for 3GPP TS 36.211 ----------------------------------------

The TP below for TS 36.211 Section 8.1 is endorsed

---------------------------------------- Start of TP for 3GPP TS 36.211 ----------------------------------------

**8.1 Uplink-downlink frame timing**

<Unchanged Text Omitted>

The quantity $N\_{TA,adj}^{UE}$ is computed by the UE based on UE position and serving satellite-ephemeris-related higher-layers parameters if configured, otherwise $N\_{TA,adj}^{UE}=0$.

<Unchanged Text Omitted>

---------------------------------------- End of TP for 3GPP TS 36.211 ----------------------------------------

The TP below for TS 36.211 Section 8.1 is endorsed

---------------------------------------- Start of TP for 3GPP TS 36.211 ----------------------------------------

**8.1 Uplink-downlink frame timing**

<Unchanged Text Omitted>

The quantity $N\_{TA,adj}^{common}$ is derived from the higher-layer parameters *TACommon*, *TACommonDrift*, and *TACommonDriftVariation* if configured (see Clause 4.2.3 in [TS 36.213]), otherwise $N\_{TA,adj}^{common}=0$.

<Unchanged Text Omitted>

---------------------------------------- End of TP for 3GPP TS 36.211 ----------------------------------------

Aspects common to IoT NTN / NR NTN:

*Agreement:*

* *Modify bit allocations for orbital parameters ephemeris format as follows:*
	+ ***Orbital parameters are indicated in 21 bytes payload:***
		- ***Semi-major axis α (m) is 33 bits***
			* ***Range: from 6500 km to 43000 km***
			* ***The quantization step is 4.249*** $×10^{-3}$***m***
		- ***Eccentricity e is 20 bits***
			* ***Range: ≤ 0.015***
			* ***The quantization step is 1.431*** $×10^{-8}$
		- ***Argument of periapsis ω (rad) is 28 bits***
			* ***Range: from 0 to 2π***
			* ***The quantization step is 2.341*** $×10^{-8}$ ***rad***
		- ***Longitude of ascending node (Ω rad) is 28 bits***
			* ***Range: from 0 to 2π***
			* ***The quantization step is 2.341***$×10^{-8}$ ***rad***
		- ***Inclination i (rad) is 27 bits***
			* ***Range: from - π/2  to + π/2***
			* ***The quantization step is 2.341***$×10^{-8}$ ***rad***
		- ***Mean anomaly M (rad) at epoch time to is 28 bits***
			* ***Range: from 0 to 2π***
			* ***The quantization step is 2.341***$×10^{-8}$ ***rad***

Epoch time:

**Agreement**

For epoch time signaling for IoT NTN:

* When explicitly provided through SIB, Epoch time of assistance information (i.e. Serving satellite ephemeris and Common TA parameters) is the starting time of a DL sub-frame, indicated by a SFN and a sub-frame number signaled together with the assistance information.
* When provided through dedicated signaling, epoch time of assistance information (i.e. Serving satellite ephemeris and Common TA parameters) is the starting time of a DL sub-frame, indicated by a SFN and a sub-frame number.
* The reference point for epoch time of the serving satellite ephemeris and Common TA parameters is the uplink time synchronization reference point.

Working assumption

Adopt NR NTN solution for interpretation SFN indicating Epoch time.

Common TA:

Working assumption

Adopt NR NTN solution for negative TACommonDriftVariation values.

Validity timer values for GEO:

**Agreement**

First discuss for additional values of validity timer for GEO in NR NTN AI 8.4.2. For IoT NTN, adopt the NR NTN agreement without modification for additional values of validity timer for GEO.

RAN2 related aspects of IoT NTN:

**Conclusion**

RAN1 can wait for RAN2 to conclude discussions on GNSS Measurements.

**Conclusion**

RAN1 can wait for RAN2 to conclude discussions on validity timer / re-acquisition on NTN-specific SIB.

**Conclusion**

RAN2 can further discuss when the UE-specific TA report is reported.

**Agreements on “8.14.2 Timing relationship enhancements”**

Agreement

RAN1 kindly suggests to spec editor of TS 36.213 to move the following text to the head of section 6.1.1:

========= Unchanged Text Omitted ==========

Throughout this clause, for a BL/CE UE, if the UE is configured with the higher layer parameter CellSpecificKoffset,

- $K\_{offset}= K\_{cell\\_offset}-K\_{UE\\_offset}$ where

 $K\_{cell\\_offset}$ is the parameter CellSpecificKoffset provided by higher layers, and

 $K\_{UE\\_offset}$ is the parameter UESpecificKoffset provided by higher layers, otherwise $K\_{UE\\_offset}=0$

otherwise,

- $K\_{offset}=0$, $K\_{cell\\_offset}=0$.

======== Unchanged Text Omitted ===============

Agreement

RAN1 kindly suggests to spec editor of TS 36.213 to adopt the following TP for section 9.1.5:

<<<<< Start of TP to TS 36.213 section 9.1.5 >>>>>>>

If the UE has initiated a PUSCH transmission using preconfigured uplink resource ending in subframe *n*, the UE shall monitor the MPDCCH UE-specific search space in a search space window starting in subframe *n+4+K*mac ***~~K~~~~mac~~*** with duration given by higher layer parameter *pur-MPDCCH-SS-window-duration* where $K\_{mac}$ is provided by higher layer parameter *K-mac*, otherwise $K\_{mac}=0$. Upon detection of a MPDCCH with DCI format 6-0A/6-0B with CRC scrambled by PUR-RNTI intended for the UE within the search space window and the corresponding DCI is for PUR ACK/fallback indication (as defined in [4]), the UE is not required to monitor the MPDCCH UE-specific search space for the remaining search space window duration.

<<<<< End of TP to TS 36.213 section 9.1.5 >>>>>>>

Agreement

RAN1 kindly suggests to spec editor of TS 36.213 to adopt the following TP for section 16.5.1:

<<<< START of TEXT PROPOSAL for TS36.213 section 16.5.1 >>>>>>>>>>>>>

**16.5.1 UE procedure for transmitting format 1 narrowband physical uplink shared channel**

NPUSCH format 1 transmission can be scheduled by a NPDCCH with DCI format N0, or the transmission can correspond to using preconfigured uplink resource configured by higher layers. Transmission using preconfigured uplink resource is initiated by higher layers as specified in [14] , while retransmission of transport blocks transmitted using preconfigured uplink resource are scheduled by a NPDCCH with DCI format N0.

A UE shall upon detection on a given serving cell of a NPDCCH with DCI format N0 ending in NB-IoT DL subframe *n* scheduling NPUSCH intended for the UE, perform, at the end of

*- n+k0+K*offset DL subframe for FDD,

*- k0* NB-IoT UL subframes following the end of *n+*8*+K*offset subframefor TDD,

a corresponding NPUSCH transmission using NPUSCH format 1 in *N* consecutive NB-IoT UL slots *ni* with *i = 0, 1, …, N-1* according to the NPDCCH information where

- subframe *n* is the last subframe in which the NPDCCH is transmitted and is determined from the starting subframe of NPDCCH transmission and the DCI subframe repetition number field in the corresponding DCI; and

- , where the value of is determined by the repetition number field in the corresponding DCI (see Clause 16.5.1.1), the value of is determined by the resource assignment field in the corresponding DCI (see Clause 16.5.1.1), the value of  is the number of NB-IoT UL slots of the resource unit (defined in clause 10.1.2.3 of [3]) corresponding to the  allocated number of subcarriers (as determined in Clause 16.5.1.1) in the corresponding DCI, and the value of is determined by the Number of scheduled TB for Unicast field, if present, in the corresponding DCI,  otherwise

- *n0* is the first NB-IoT UL slot starting after the end of subframe *n+k0+Koffset* for FDD

- *n0* is the first NB-IoT UL slot starting after *k0* NB-IoT UL subframes following the end of *n*+8*+Koffset* subframe for TDD

- value of *k0* is determined by the scheduling delay field () in the corresponding DCI according to Table 16.5.1-1 for FDD and Table 16.5.1-1A for TDD

<<<< END of TEXT PROPOSAL for TS36.213 section 16.5.1 >>>>>>>>>>>>>

Agreement

RAN1 kindly suggests to spec editor of TS 36.213 to adopt the following TP for section 8.0:

<<<< START of TEXT PROPOSAL for TS36.213 section 8.0 >>>>>>>>>>>>>

A BL/CE UE shall upon detection on a given serving cell of an MPDCCH with DCI format 6-0A/6-0B scheduling PUSCH intended for the UE, perform a corresponding PUSCH transmission in subframe(s) *ni* = *n+ki+Koffset* if a transport block(s) corresponding to the HARQ process(es) of the PUSCH transmission is generated as described in [8] with *i = 0, 1, …, NTBN-1* according to the MPDCCH, where

- subframe *n* is the last subframe in which the MPDCCH is transmitted;

- the value of is the number of scheduled TB determined by the corresponding DCI if present,  otherwise;

*-*  and the value of  is determined by the *repetition number* field in the corresponding DCI, where

- if the UE is configured with higher layer parameter *ce-pdsch-puschEnhancement-config* with value 'On' are given by {1,2,4,8,12,16,24,32}

- otherwise, are given in Table 8-2b and Table 8-2c; and

- if the UE is configured with higher layer parameter *ce-PUSCH-SubPRB-Config-r15*, and the PUSCH resource assignment in the corresponding DCI is using uplink resource allocation type 5,  where *N* ≤ 32 for CE Mode A and *N* ≤ 2048 for CE Mode B,  is defined in [3] and  is determined according to procedure in clause 8.1.6,  otherwise

- in case *N>1*, subframe(s) *n+ki*+*Koffset* with *i=0,1,…, NTBN-1* are *NTBN* consecutive BL/CE UL subframe(s) starting with subframe *n+x*+*Koffset*, and in case *N=1*, *k0=x*;

<<<< Portion of specification removed >>>>>

- for FDD, *x = 4*;

<<<< END of TEXT PROPOSAL for TS36.213 section 8.0 >>>>>>>>>>>>>

Agreement

In IoT NTN, the Koffset value signalled in system information (cell specific Koffset) is always used for NPDCCH and MPDCCH ordered NPRACH and PRACH timing relationships, respectively.

**Agreement**

RAN1 kindly suggests to spec editor of TS 36.213 to adopt the following TP for section 16.3.2:

<<<< START of TEXT PROPOSAL for TS36.213 section 16.3.2 >>>>>>>>>>>>>

In case a random access procedure is initiated by a "PDCCH order" ending in subframe *n*, the UE shall, if requested by higher layers, start transmission of random access preamble at the end of the first subframe $n+k\_{2}+K\_{cell\\_offset}$, , where a NPRACH resource is available.

<<<< END of TEXT PROPOSAL for TS36.213 section 16.3.2 >>>>>>>>>>>>>

Working assumption

For IoT NTN, the unit of K\_mac and Koffset when subcarrier spacing is 3.75kHz is 1 ms.

**Agreement**

Confirm the WA on units of Kmac and Koffset with 3.75kHz SCS:

Working assumption

For IoT NTN, the unit of K\_mac and Koffset when subcarrier spacing is 3.75kHz is 1 ms.

**Agreement**

For IoT NTN, calculate UE-eNB RTT using the following equation: $RTT\_{UE}^{eNB}=floor(\frac{T\_{TA}}{T\_{f}})+K\_{mac}$

where *Tf* = subframe duration (1ms).

**Agreement**

The TP below for TS 36.213 Clause 16.1.2 is endorsed

<<< Start of TP to Clause 16.1.2, TS 36.213 >>>

For a timing advance command reception ending in DL subframe *n*, the corresponding adjustment of the uplink transmission timing shall apply from the first available NB-IoT uplink slot following the end of *n*+12~~+~~*~~K~~*~~offset~~ DL subframe and the first available NB-IoT uplink slot is the first slot of a NPUSCH transmission.

<<< End of TP to Clause 16.1.2, TS 36.213 >>>

#### Remaining Open issues

Complete maintenance phase for 8.14.1 and 8.14.2

## 2.2 RAN2

#### 2.2.1 Agreements

* **RAN2#117-e, Feb 21st – March 3rd, 2022, e-meeting**

Agreements from AI 9.2.1: General

R2-2204108 Reply LS on opens issues for NB-IoT and eMTC support for NTN RAN2 LS out

Agreements from AI 9.2.3: Open Issues

* For eMTC, use a reserved LCID for the TA Report MAC CE.
* Regarding how to extend sr-ProhibitTimer in IoT NTN, attempt configurable offset.
* Use a reserved LCID for the MAC CE corresponding K\_Offset.
* For NB-IoT, use a reserved LCID for the TA Report MAC CE.
* On logical channel priority, put the UE-specific TA report MAC CE between “MAC control element for AUL confirmation” and “MAC control element for BSR, with exception of BSR included for padding”.
* During RA procedure for RRC re-establishment procedure, the UE should trigger TA report if an indication is broadcasted by the target cell’s SI. (aligned with NR NTN)
* During RA procedure for handover, the UE should trigger TA report if the target cell indicates this in the handover command. (aligned with NR NTN)
* Other than re-establishment (TA reporting controlled by target cell’s SI) and handover procedure (TA reporting controlled by HO command), TA reporting in connected mode is not controlled by enabling/disabling indication in SI. (aligned with NR NTN)
* RAN2 to clarify the previous agreement as: Upon reception of configuration or reconfiguration of TA reporting trigger event, if UE has not reported TA to current serving cell before (during this connection), the UE triggers a TA reporting. (can further check this during the implementation in the MAC CR). (aligned with NR NTN)
* Target cell can use delta configuration for the event configuration in handover command.
* Threshold-based TA-Trigger for TA value reporting will align with NR-NTN.
* Configuration of event triggered TA report will include TA offset threshold between current TA and the last successfully reported TA (similar to NR-NTN). FFS: The value of the TA offset threshold (consider possible to align with NR-NTN values).
* Extend RLC t-Reordering timer by adding values {ms2200, ms3200}.
* Do not add values between ms200 and ms1600 for extending RLC t-Reordering timer.
* Introduce a new discardTimer value ms2000 for eMTC over NTN. FFS whether to add ms3000.
* The two MAC CEs’ names are “Timing Advance Report MAC CE” and “Differential Koffset MAC CE”.
* Adopt the following field description for the “Timing Advance Report MAC CE”:
	+ R: Reserved bit, set to 0;
	+ Timing Advance: The Timing Advance field indicates the least integer number of subframes greater than or equal to the Timing Advance value (see TS 36.211 [7] section 8.1). The length of the field is 14 bits.
* Adopt the following field description for the “Differential Koffset MAC CE”:
	+ R: Reserved bit, set to 0;
	+ Differential Koffset: This field contains the differential Koffset. The length of the field is 6 bits.
* A new bit, e.g. cellBarred-NTN, is introduced in SIB1 to bar NTN UEs from accessing a NTN cell. FFS whether to consider MIB instead of SIB1 for NB-IoT. NTN UE ignores the legacy bit.
* SIBXX is an essential SIB, i.e. the UE shall consider the cell barred if it is unable to acquire the SIB when scheduled.
* UE shall acquire the NTN specific SIB before accessing the cell, regardless of the state of UL sync validity timer.
* FFS if we Will have a guard timer to handle the case where the UE takes ‘forever’ reacquire the SIB. At timer expiry UE triggers RLF handling. (Note that it is expected that the timer will not expire in the normal case, and the UE can just come back acc to previous decision).
* All parameters needed to access the target cell are included in RRCReconfiguration message for handover.
* For simplicity, the whole SIBXX structure is included in RRCReconfiguration message for handover.
* RAN2 assumes Upon recovery from loss of precomp synch while TAT has not expired, UE resumes UL operation, no RACH is needed.
* When the UE tunes away, it is assumed that the UE may not receive DL dedicated transmissions, actions in the DL can be left to UE implementation.
* There is some support for enhancements for long data transmissions, which could be Rel-18.
* Introduce a guard timer TXXXX for SIBXX acquisition in connected mode. At TXXX expiry, UE triggers RLF (if it can be shown in Q2 that UE will loose RLM when UE tunes away, it can be discussed to skip this timer)
* Introduce a presence indicator in addition to the 2 bit LSB EARFCN in the NB-IoT MIB (eMTC - all aspects FFS)
* Upon timer expiry (or UE tune away), UE stops all UL transmissions, flushes all HARQ buffers and maintains all UL resources.
* The UL synchronisation validity timer is maintained in RRC.
* Modified Proposal 4: SIBXX acquisition is captured in 5.2.2. UE actions upon ul-SyncValidityTimer expiry are described in a new section in 5.3.3, which will refer to 5.2.2 for SIBXX (re)acquisition
* SIBXX is included outside mobilityControlInfo, similarly to other dedicated SIB.
* t-service is moved to SIB3.
* UE shall perform neighbour cell measurement of higher priority inter-frequency or inter-RAT frequencies regardless of the remaining serving time.
* Do not capture UE behaviour w.r.t to registration update in multiple tracking areas case in TS 36.304 section 5.4.
* Unless RAN1 updates the RRC parameters spreadsheet otherwise, align the value range of the ephemeris position state vectors with the number of signalling bits.
* Unless RAN1 updates the RRC parameters spreadsheet otherwise, align the value range of the ephemeris velocity state vectors with the number of signalling bits.
* cellBarred-NTN is signalled in SIB1 for NB-IoT.
* RAN2 will use a new SIB to share the ephemeris information for Discontinuous Coverage with the UEs. Sharing the information using dedicated RRC signalling is FFS.
* While Out of Coverage in Discontinuous Coverage deployment (in Idle Mode or PSM mode) the UE is not required to perform any cell search and may deactivate its AS functions to optimize the power consumption. The remaining UE behaviour is left to UE implementation. FFS whether anything need to be specified for ASNAS interaction.
* For Discontinuous Coverage, ephemeris information of up to a maximum X satellites can be shared using the new SIB, where X is limited by the volume of information vs capacity of the SIB (X=4 is baseline). Increasing this maximum number by using dedicated RRC Signalling and by any further ephemeris optimization is FFS.
* RAN2 assumes that for Discontinuous Coverage, network can signal mean ephemeris parameters (for neighbours and potentially serving satellite for coverage prediction purpose), using the same (already introduced) ephemeris format. UE can always assume these are mean values and It is up to the network implementation to derive this mean value (and any trade-off between instantaneous and mean values if needed). FFS whether additional assumptions (like averaging time) need to be clarified, e.g. to have predictable performance.
* P1: No further enhancement on cell reselection priority is needed in IoT-NTN.
* P2: RAN2 will follow the RAN1 agreement that UE will report the remaining GNSS validity duration to the network. FFS: value range (not clear if the values of RAN1 agreement can be used). FFS which message.
* P3: For Prediction of discontinuous coverage, Information about satellite id, ephemeris type (FFS if two, three of four types) and epoch time will be provided with the ephemeris information. FFS if epoch time can be optional and be implicitly derived.

Agreements from AI 9.2.4: UE capabilities

Initial agreements, considering diff/sim in impl. (not considering IODT for now)

* P1: Support for reception of multiple tracking areas in system information and updating the TA list to NAS is considered as mandatory capability for NTN access.
* P2: Timer modification for PUR operation for NTN is optional UE capability (assume with separate UE capability indication)
* P3: CHO capability for eMTC-NTN is indicated by the existing LTE CHO capability indication.

#### 2.2.2 Remaining Open issues

OI 4.4 [Company Tdocs Invited]: Whether Capability Indication of existing IoT-Features until Rel-16 are reused in NTN, or to what extent they need to be duplicated to allow for different Interoperability Test (IOT) Status

OI 2.11 [Other] Signalling range of positionX, positionY, positionZ

OI 2.12 [Other] Signalling range and step size of velocityVX, velocityVY, velocityVZ

OI 2.13 [Other] UE location reporting in eMTC

OI 2.14 [Other] UE location reporting in NB-IoT

## 2.3 RAN3

#### 2.3.1 Agreements:

* **RAN3#114bis-e, 17th January – 26th January 2022, e-meeting**
* Whether the UE using CP CIoT EPS optimization only can provide the fine UE location information to eNB should be checked by SA2 SA3, and RAN2.
* The IE for target eNB to identify an existing UE is needed over S1 for IoT over NTN, the name of the newly added IE is “UE Context Reference at Source eNB”. This IE should be put in the container.
* For the O&M Requirements in 36.300, add a reference to 38.300 and check whether if there is any difference.
* The potential enhancements on energy saving are not included in Release 17, unless critical issues are identified.
* Introduce the LTE-M Satellite Indication IE in the UE CAPABILITY INFO INDICATION message over S1.
* **RAN3#115-e, Feb 21st – March 3rd, 2022, e-meeting**
* The feasibility of providing the location information via NAS for NB-IoT UEs is out of RAN3 scope.
* The cause value “UE not in PLMN serving area” for country-specific routing is introduced over S1.
* Only capture stage 2 clarification on mapped cell ID construction.
* Introduce the multiple TAC reporting in ULI, INITIAL UE MESSAGE message, UPLINK NAS TRANSFER message, LOCATION REPORT message, HANDOVER NOTIFY message, eNB CP RELOCATION message and PATH SWITCH REQUEST message, the IE structure keeps aligned with the stable IE structure in NR NTN.

2.3.2 Remaining Open issues:

100% of the items defined in the RAN3 WID objectives have been accomplished.

## 2.4 RAN4

#### 2.4.1 Agreements: N/A (RAN4 is not involved in the SI)

#### 2.4.2 Remaining Open issues: N/A

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

## 4.1 RAN1

**RAN1#108-e, Feb 21st – March 3rd, 2022, e-meeting**

Submitted TDocs to AI 8.14.3: Others

* [R1-2201589](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CDocs%5CR1-2201589.zip) Discussion on other aspects for NB-IoT/eMTC over NTN Nokia, Nokia Shanghai Bell
* [R1-2201810](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CDocs%5CR1-2201810.zip) Mobile IoT in the 5G future – NB-IoT and eMTC for NTN Ericsson Hungary Ltd
* [R1-2201951](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CDocs%5CR1-2201951.zip) Discussion on the other design aspects for IoT NTN Xiaomi
* [R1-2202425](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CDocs%5CR1-2202425.zip) Other aspects to support IoT in NTN Huawei, HiSilicon
* R1-2202937 " List of RAN1 agreements for Rel-17 IoT NTN (Post RAN1#108-e)", Moderator (MediaTek Inc.), RAN1#108-e, February 2021
* R1-2201220 " List of RRC Parameters for Rel-17 IoT NTN (Post RAN1#108-e)", Moderator (MediaTek Inc.), RAN1#108-e, February 2021

Submitted to AI 8.14.1 Enhancements to time and frequency synchronization

* [R1-2200941](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2200941.zip) Maintenance on time and frequency synchronization enhancement for IoT in NTN Huawei, HiSilicon
* [R1-2201217](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201217.zip) Enhancements to time and frequency synchronization for IoT NTN MediaTek Inc.
* [R1-2201275](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201275.zip) Discussion on enhancements to time and frequency synchronization OPPO
* [R1-2201342](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201342.zip) Remaining issues on time and frequency synchronization enhancement for IoT over NTN CATT
* [R1-2201587](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201587.zip) Remaining issues of time and frequency synchronization for NB-IoT/eMTC over NTN Nokia, Nokia Shanghai Bell
* [R1-2201652](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201652.zip) Enhancements to time and frequency synchronization Qualcomm Incorporated
* [R1-2201789](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201789.zip) Remaining Issues of Uplink Time and Frequency Synchronization for IoT NTN Apple
* [R1-2201808](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201808.zip) On time and frequency synchronization maintenance issues for IoT over NTN Ericsson Hungary Ltd
* [R1-2201880](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201880.zip) Remaining issues on enhancements to time and frequency synchronization for IoT NTN CMCC
* [R1-2201950](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201950.zip) Remaining issues on UL time and frequency synchronization for IoT NTN Xiaomi
* [R1-2202210](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2202210.zip) Remaining issues of synchronization for NR-NTN ZTE
* [R1-2202408](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2202408.zip) Maintenance of IoT-NTN time and frequency synchronisation Sony
* [R1-2202479](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2202479.zip) Enhancements to time and frequency synchronization Mavenir
* R1-2110673, Moderator (MediaTek), LS on Validity Timer for UL Synchronization, RAN1#106bis-e, October 2021
* R1-2112848, Moderator (MediaTek), LS on GNSS Validity duration for IoT NTN, RAN1#107-e, November 2021
* R1-2111377, Moderator (MediaTek), List of IoT over NTN Rel-17 RRC parameters, RAN1#107-e, November 2021
* R1-2112975, Moderator (Ericsson), Consolidated higher layers parameter list for Rel-17 LTE, RAN1#107-e, November 2021
* R1-2201184, Thales, TP for RAN1 additions to the stg2 CR for TS 38.300, , RAN1#108-e, February 2021
* R1-2201559, Spreadtrum, Discussion on enhancements to time and frequency synchronization for IOT NTN, February 2021
* R1-222915, Moderator (MediaTek), Summary #4 of AI 8.14.1 Enhancements to time and frequency synchronization, RAN1#108-e, February 2021
* R1-222839, Moderator (MediaTek), Summary #3 of AI 8.14.1 Enhancements to time and frequency synchronization, RAN1#108-e, February 2021
* R1-2202724, Moderator (MediaTek), Summary #2 of AI 8.14.1 Enhancements to time and frequency synchronization, RAN1#108-e, February 2021
* R1-2201219, Moderator (MediaTek), Summary #1 of AI 8.14.1 Enhancements to time and frequency synchronization, RAN1#108-e, February 2021
* R1-2202930 –Draft LS on IoT-NTN TP for TS 36.300
* R1-2202931 –LS on IoT-NTN TP for TS 36.300
* R1-2202917 – RAN1 IoT NTN additions for TS 36.300

Submitted TDocs to 8.14.2: Timing relationship enhancements

* [R1-2200942](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2200942.zip) Maintenance on timing relationship enhancement for IoT in NTN Huawei, HiSilicon
* [R1-2201218](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201218.zip) Timing relationship enhancements for IoT NTN MediaTek Inc.
* [R1-2201276](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201276.zip) Discussion on timing relationship enhancements OPPO
* [R1-2201343](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201343.zip) Remaining issues on timing relationship enhancement for IoT over NTN CATT
* [R1-2201586](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201586.zip) Maintenance of IoT-NTN timing relationships Sony
* [R1-2201588](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201588.zip) Remaining issues of timing relationship enhancements for NB-IoT/eMTC over NTN Nokia, Nokia Shanghai Bell
* [R1-2201653](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201653.zip) Timing relationship enhancements Qualcomm Incorporated
* [R1-2201790](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201790.zip) Remaining Issues of Timing Relationship Enhancement for IoT NTN Apple
* [R1-2201809](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201809.zip) On timing relationship maintenance issues for IoT over NTN Ericsson Hungary Ltd
* [R1-2201881](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2201881.zip) Remaining issues on timing relationship enhancements for IoT NTN CMCC
* [R1-2202211](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2202211.zip) Remaining issues of timing relationship for IoT-NTN ZTE
* [R1-2202480](file:///C%3A%5CUsers%5Cmtk06374%5CDocuments%5C3GPP%20RAN1%5CRAN1%23108-e%5CDocs%5CR1-2202480.zip) Timing relationship enhancements Mavenir
* R1-2202587 FL summary 3 of AI 8.14.2 Timing relationship for IoT-NTN Moderator (Sony)
* R1-2202586 FL summary 2 of AI 8.14.2: Timing relationships for IoT-NTN Moderator (Sony)
* R1-2202585 FL summary 1 of AI 8.14.2: Timing relationships for IoT-NTN Moderator (Sony)

## 4.2 RAN2

**RAN2#117-e, Feb 21st – March 3rd, 2022, e-meeting**

Submitted TDocs to AI 9.2.1: General

* [R2-2202105](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202105.zip) Reply LS on EPS support for IoT NTN in Rel-17 (C1-220532; contact: MediaTek)
* [R2-2202135](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202135.zip) LS on opens issues for NB-IoT and eMTC support for NTN (R3-221406; contact: Nokia)
* [R2-2203928](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203928.zip) LS Response to LS on UE providing Location Information for NB-IoT (S2-2201333; contact: Qualcomm)
* [R2-2204071](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2204071.zip) Reply LS on UE providing Location Information for NB-IoT (C1-222100; contact: Apple)
* [R2-2204083](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2204083.zip) Reply LS on opens issues for NB-IoT and eMTC support for NTN (S3-220543; contact: Xiaomi)
* [R2-2204084](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2204084.zip) Reply LS on security concerns for UE providing Location Information for NB-IoT (S3-220544; contact: Xiaomi)
* [R2-2203220](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203220.zip) OI 2.10: Signalling of part-of-ARFCN indication in MIB in NB-IOT, Huawei, HiSilico
* [R2-2203219](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203219.zip) Support of Non-Terrestrial Network in NB-IoT and eMTC, Huawei, CR Rel-17 36.331, 16.7.0, 4771-B
* [R2-2203455](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203455.zip) IoT NTN Stage 2 CR, Ericsson, Eutelsat, CR Rel-17, 36.300, 16.7.0, 1356-B
* [R2-2203456](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203456.zip) IoT NTN Idle mode CR, Ericsson, CR Rel-17, 36.304, 16.6.0 0843- B
* [R2-2203457](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203457.zip) IoT NTN Idle mode Open issue resolutions Ericsson
* [R2-2202744](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202744.zip) draft Running CR to 36.306 for IoT-NTN UE capabilities, Nokia Solutions & Networks (I), draftCR, Rel-17, 36.306, 16.7.0 B

Submitted TDocs to AI 9.2.2: Open Issues

* [R2-2203160](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203160.zip) Summary of [Pre117-e][011][IoT-NTN] User plane Open Issues Input
* [R2-2203841](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203841.zip) Report of [AT117-e][011][IoT-NTN] User Plane (OPPO)
* [R2-2204047](file:///C%3A%5CUsers%5Cjohan%5COneDrive%5CDokument%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2204047.zip) Report of [AT117-e][011][IoT-NTN] User Plane (OPPO)
* [R2-2203221](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203221.zip) Report of [Pre117-e][012][IOT-NTN] Control Plane Open Issues (Huawei)
* [R2-2203923](file:///C%3A%5CUsers%5Cjohan%5COneDrive%5CDokument%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203923.zip) Report of [AT117-e][012][IOT-NTN] Control Plane (Huawei)
* [R2-2203521](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203521.zip) [Pre117-e][013][IoT-NTN] Discontinous Coverage Open Issues Input MediaTek Inc.
* [R2-2203860](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203860.zip) [AT117-e][015][IoT-NTN] Miscellaneous Issues (MediaTek)
* [R2-2203707](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203707.zip) Summary of Invited Tdoc Input in IoT-NTN, MediaTek Inc.
* [R2-2203721](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203721.zip) Summary of Invited Tdoc Input in IoT-NTN, MediaTek Inc.
* [R2-2203530](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203530.zip) On GNSS validity duration reporting Ericsson, Nokia, Nokia Shanghai Bell, Turkcell, NEC, Qualcomm, ZTE
* [R2-2202352](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202352.zip) Discussion on the additional new parameters for supporting discontinuous coverage for IoT over NTN, Transsion Holdings
* [R2-2202414](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202414.zip) Discussion on the remaining issue of IoT over NTN, Spreadtrum Communications
* [R2-2202458](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202458.zip) Discussion on additional parameters for Non continuous coverage, Intel Corporation
* [R2-2202549](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202549.zip) Location reporting in NAS, Apple
* [R2-2202550](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202550.zip) Support of discontinuous coverage, Apple
* [R2-2202559](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202559.zip) Additional issues on the support of the discontinuous coverage, Qualcomm Incorporated
* [R2-2202562](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202562.zip) Signalling of multiple TACs per PLMN in eMTC and NB-IoT, Qualcomm Incorporated
* [R2-2202589](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202589.zip) Satellite assistance information and exchange for discontinuity Prediction in IoT NTN, Lenovo, Motorola Mobility
* [R2-2202615](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202615.zip) UP leftover issues for IoT-NTN, CMCC
* [R2-2202621](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202621.zip) Discussion on open issues for support of Non continuous coverage, CMCC
* [R2-2202729](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202729.zip) Remaining Issues of CP Impact of IoT over NTN CMCC
* [R2-2202746](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202746.zip) Remaining issues of user plane in IoT NTN ZTE Corporation, Sanechips
* [R2-2202747](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202747.zip) Remaining issues of control plane in IoT NTN ZTE Corporation, Sanechips
* [R2-2202748](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202748.zip) Remaining issues of discontinuous coverage in IoT NTN, ZTE Corporation, Sanechips
* [R2-2202749](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202749.zip) Remaining issues of UE capabilities in IoT NTN ZTE Corporation, Sanechips
* [R2-2202931](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202931.zip) Discussion on discontinuous coverage, Xiaomi
* [R2-2203000](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203000.zip) Discussion on UP open issues in IoT NTN, OPPO
* [R2-2203001](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203001.zip) Discussion on the open issues of discontinuous coverage for IoT over NTN, OPPO
* [R2-2203002](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203002.zip) Discussion on Control Plane open issues for IoT NTN, OPPO
* [R2-2203052](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203052.zip) On remaining control plane issues for IoT-NTN Nokia Solutions & Networks (I)
* [R2-2203080](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203080.zip) Further Discussion on the Open Issues of IoT-NTN Control Plane, CATT
* [R2-2203081](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203081.zip) Open Issue on UP and Discontinous Coverage, CATT
* [R2-2203192](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203192.zip) Issues related to IOT NTN RRC running CR, Xiaomi
* [R2-2203193](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203193.zip) Remaining issues of IOT NTN RRC Xiaomi
* [R2-2203222](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203222.zip) OI 2.9: Signalling of multiple TACs per PLMN in eMTC and NB-IoT, Huawei, HiSilicon
* [R2-2203223](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203223.zip) OI 3.5: Discussion on non continuous coverage, Huawei, HiSilicon
* [R2-2203258](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203258.zip) On IoT NTN open issues for Discontinuous Coverage and User plane, Nokia, Nokia Shanghai Bell
* [R2-2203293](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203293.zip) (O1 3.5) Parameters for coverage gap prediction and Idle mode behaviour Interdigital, Inc.
* [R2-2203453](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203453.zip) Control plane and discontinuous coverage aspects of IoT NTN Ericsson
* [R2-2203483](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203483.zip) User plane aspects of NB-IoT and LTE-M in NTNs Ericsson

Submitted TDocs to AI 9.2.4: UE capabilities

* [R2-2203983](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203983.zip) Report on[AT117-e][064][IoT-NTN] UE capabilites (Nokia), Nokia, Nokia Shanghai Bell
* [R2-2203224](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203224.zip) OI 4.1 and OI 4.2: UE capabilities open issues, Huawei, HiSilicon
* [R2-2203225](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203225.zip) OI 4.4: TN – NTN differentiation, Huawei, HiSilicon
* [R2-2202415](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202415.zip) Remaining FFSs on UE Capabilities Spreadtrum Communications
* [R2-2202724](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202724.zip) Remaining Issues on IoT NTN UE Capabilities, CMCC
* [R2-2202742](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202742.zip) Further analysis on remaining open issues for IoT-NTN Capabilities, Nokia, Nokia Shanghai Bells
* [R2-2202932](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202932.zip) Discussion on UE capabilities, Xiaomi
* [R2-2203003](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203003.zip) Discussion on IoT NTN UE capabilities, OPPO
* [R2-2203237](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203237.zip) Remaining open issues of IoT NTN UE capabilities, NEC Telecom MODUS Ltd.
* [R2-2203454](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203454.zip) On IoT NTN capabilities, Ericsson

Submitted TDocs to AI 9.2.5: Other

* [R2-2202560](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2202560.zip) UE state mismatch upon expiry of GNSS validity timer, Qualcomm Incorporated
* [R2-2203259](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_117-e%5CDocs%5CR2-2203259.zip) On IoT NTN Other open issues, Nokia, Nokia Shanghai Bell

## 4.3 RAN3

**RAN3#114bis-e, Jan 17th – Jan 26th, 2022, e-meeting**

Submitted TDocs to AI 30.1:

* [R3-220436](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220436.zip) Work Plan on NB-IoT and eMTC Support for NTN ZTE
* [R3-220397](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220397.zip) Proposal for IoT NTN Baseline CRs Ericsson
* [R3-220982](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220982.zip) Discussion on NB-IoT and eMTC Support for NTN ZTE
* [R3-220469](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220469.zip) Discussion about location report and mapping in NTN-IoT Huawei
* [R3-220739](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220739.zip) Discussion on NB-IoT and eMTC Support for NTN CATT
* [R3-220314](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220314.zip) NNSF for IoT NTN providing access over multiple countries Qualcomm Incorporated
* [R3-220399](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220399.zip) Support of NTN RAT identification and NTN RAT restrictions Ericsson
* [R3-220741](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220741.zip) IoT NTN CR for 36.423 CATT
* [R3-220983](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_114bis-e%5CDocs%5CR3-220983.zip) NB-IoT/eMTC support for Non-Terrestrial Networks ZTE

**RAN3#115-e, Feb 21st – March 3rd, 2022, e-meeting**

Submitted TDocs to AI 30.1:

* R3-221655 LS on UE providing Location Information for NB-IoT RAN2
* R3-221798 UE Location Information and IoT NTN Ericsson
* R3-221923 Dicussion about location report and mapping in NTN-IoT Huawei
* R3-222043 Further Discussion on NB-IoT and eMTC Support for NTN ZTE
* R3-222376 (TP for IoT NTN BL CRs) TAC Reporting in ULI CATT
* R3-221905 (TP for TS36.300 BL CR) Discussion on the mapped cell ID and TAC reporting in S1AP Nokia, Nokia Shanghai Bell
* R3-221906 (TP for TS36.413 BL CR) Update for the mapped cell ID and TAC reporting in S1AP Nokia, Nokia Shanghai Bell
* R3-222044 (TP for IoT NTN BL CR 36.300, 36.410 and 36.413) NB-IoT and eMTC Support for NTN ZTE
* R3-222375 (TP for IoT NTN BL CRs) Cause Value and for Cross-country Scenario CATT
* R3-221924 TP to stage 2 BL CR Huawei, China Unicom, CMCC

# 5 Others

***END***