**3GPP TSG-RAN WG2 Meeting #131 *R2-250xxxx***

**Bengaluru, India, August 25th – 29th, 2025**

**Agenda item: 8.9.1**

**Source: Huawei, HiSilicon**

**Title: RRC open issue list for IoT NTN**

**Document for: Discussion and Decision**

1. Introduction

The following document includes a list of open issues according to the following email discussion:

* [Post130][306][R19 IoT NTN] RRC CR (Huawei)

 Scope: discuss the running RRC CR

 Intended outcome: Endorsed CR and list of remaining open issues

 Deadline: long

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1. First Round: Comments collection and resolution

**Please provide your comments to the RRC CR in the table following similar format as the example:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Section/clause/IE** | **Comments/Suggested Change** | **Rapp Response** |
| MTK01 vivo01 | 5.3.3.1x Conditions for initiating CB-Msg3 EDT in NTN | We should use CB-Msg3-EDT rather than CB-Msg3 EDT to align with the RAN2 agreement and 36.300/36.321**vivo additional comment:** From stage-2 spec, CB-Msg3 is a kind of MO-EDT, the conditions should be added in 5.3.3.1b. I.E.,5.3.3.1b Conditions for initiating EDTA BL UE, UE in CE or NB-IoT UE can initiate EDT using the random access procedure when all of the following conditions are fulfilled:…A BL UE, UE in CE Mode A or NB-IoT UE can initiate EDT using the CN-Msg3-EDT procedure when all of the following conditions are fulfilled:[ZTE] We may have different view as vivo. See ZTE04 | Agree and regarding modelling, vivo/Samsug/Ericsson suggestions are adopted for simplicity and alignment with Stage 2.  |
| MTK02 | 5.3.3.1x A BL UE, UE in CE Mode A or NB-IoT UE can initiate CB-Msg3 EDT transmission when all of the following conditions are fulfilled: | The T in EDT is for transmission, this additional transmission is not needed. Suggest to delete it.vivo agrees with it. | Agree |
| MTK03 | 5.3.3.1xthe measured RSRP satisfies the conditions specified in TS 36.321 [6], clause X; | We think it is sufficient to check the minimum RSRP threshold of initialing CB-Msg3-EDT **in RRC**. There seems no need referring to 36.321. Suggest some like“the measured RSRP is larger than the minimum RSRP threshold configured in *cb-Msg3-MinRSRP-Threshold* (in *cb-Msg3-MinRSRP-Threshold-NB* for NB-IoT)”[ZTE] We have similar understanding as MTK and generally fine with MTK’s suggestion. Only comments is that, considering the configured RSRP threshold is the mininum valid value, the wording can be changed like this “the measured RSRP is ~~larger than~~ greater than or equal to the minimum RSRP threshold” | Agree and revise as ZTE suggests  |
| MTK04 | 5.3.3.1x1> the size of the resulting MAC PDU including the total UL data is expected to be smaller than or equal to the TBS signalled in *[FFS parameter name]*, as specified in TS 36.321 [6], clause X; | Unlike the legacy EDT, UE does not move to the next CE level when the number of max re-attempt has been reached, there will be no TBS check after that point. The only TBS check occurs before the procedure is for initialization. We suggest that the TBS check is only captured in RRC spec, and the reference to MAC can be removed.Nokia03: The maximum TBS is defined per CE level while the CE level determination is captured in MAC spec. In this sense, referring to MAC spec seems reasonable (as legacy)[ZTE] We have similar understanding as MTK and generally fine with MTK’s suggestion | Agree and revise as MTK suggests  |
| MTK05 | – CB-Msg3-ConfigSIBcb-Msg3-MaxAttemptNum-r19 ENUMERATED {n3, n4, n5, n6, n7, n8, n10}  | It better starts with n2. If this IE is absent, no re-attempt should be assumed. | Agree |
| MTK06 | CB-MSG3-MPDCCH-Config-r19 ::= SEQUENCE { mpdcch-Narrowband-r19 INTEGER (1..maxAvailNarrowBands-r13), mpdcch-PRB-PairsConfig-r19 SEQUENCE{ numberPRB-Pairs-r19 ENUMERATED {n2, n4, n6, spare1}, resourceBlockAssignment-r19 BIT STRING (SIZE(4))  }, | Indentation issue on numberPRB-Pairs-r19 and resourceBlockAssignment-r19. | Agree |
| MTK07 | maxCE-Level-NB-r19 INTEGER ::= 3 | It should be placed at 6.7.4 | Agree |
| MTK08 | CB-Msg3-ProbabilityAnchorList-NB-r19  | RAN2 agrees that **a** new probability parameter for anchor carrier is introduced in SIB22-NB. RAN2 can further discuss whether it should be a **single value** or **a list of value for each CE level**. | Current implementation in the running CR follows legacy. But if there is concern, I can add one open issue for RAN2 to further discuss. |
| MTK09 | cb-Msg3-RSRP-CE-Level-NB-r19 CB-Msg3-RSRP-CE-Level-NB-r19 | It should be *cb-Msg3-RSRP-CE-Level-List-NB-r19*. | To avoid a long name, updated to cb-Msg3-RSRP-CE-Level**s**-NB-r19 |
| MTK10 |  npusch-SubCarrierSetIndex-r19 CHOICE { khz15 INTEGER (0..18), khz3dot75 INTEGER (0..47) }, | According to the RAN1 LS1, it should be **defined as a set**. * The following parameters can be supported:
	+ npusch-NumRUsIndex-r16
	+ npusch-NumRepetitionsIndex-r16
	+ npusch-SubCarrierSetIndex-r16 (but defining this as a set)
	+ npusch-MCS-r16

[ZTE] Agree with MTK10 | OK |
| MTK11 | ack-NumRepetitions-NB-r19 ACK-NACK-NumRepetitions-NB-r13, | This IE could be optional. It is absent, the same value in SIB2 for NPRACH can be used.If this field is absent, the UE apply the value *ack-NACK-NumRepetitions-r13* configured in *SystemInformationBlockType2-NB*. | OK |
| MTK12 | cb-Msg3-MaxAttemptNum-NB-r19 ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1}, | Same comment to cb-Msg3-MaxAttemptNum-r19. And this IE should be optional. | Agree |
| MTK13 | **CB-Msg3-ConfigList-NB**CB-Msg3 EDT configuration for each CE level applicable to a UE performing CB-Msg3 EDT. The first entry in the list is the CB-Msg3 EDT configuration for CE level 0, the second entry in the list is the CB-Msg3 EDT configuration for CE level 1, and so on.  | It is a legacy UE behavior that numbers of CE levels in the anchor carrier and non-anchor carrier are the same. I think we can stick it.Here we can add:For the CB-Msg3-ConfigList-NB in *SystemInformationBlockType22-NB*, E-UTRAN includes the same number of entries, and listed in the same order, as in *CB-Msg3-ConfigList-NB* in *SystemInformationBlockType2-NB.* | Agree |
| MTK14 | ***cb-Msg3-ResponseWindow-NB***MPDCCH search space window duration. See TS 36.321 [6] and TS 36.213 [23]. Value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. The value considered by the UE is: *mac-ContentionResolutionTimer* = Min (signaled value x PDCCH period, 10.24s). | The MPDCCH should be NPDCCH. *mac-ContentionResolutionTimer* cleary is a mistake. | Agree |
| MTK15 | ***npdcch-CarrierIndex***Indicates the non-anchor carrier for receiving Msg4. If this field is absent, UE receives Msg4 on the anchor carrier. | We suggest a clearer text:Indicates the carrier in the list of DL non-anchor carriers for receiving CB-Msg4. If this field is absent, UE receives CB-Msg4 on the anchor carrier. | Updated to “CB-Msg4”. For the first revision, it seems no extra information is added. |
| MTK16 | ***cb-Msg3-NumOfReplicas-NB***Indicates the number of replicas that UE should send for CB-Msg3 EDT. | Suggest to modify as: Indicates the number of replicas that UE should send within one attempt of CB-Msg3 EDT.[ZTE] Generally fine with this suggestion | Agree |
| Qualcomm | ***6.3.2 CB-Msg3-ConfigSIB***CB-Msg3-Config-r19 ::= SEQUENCE { cb-Msg3-TBS-r19 ENUMERATED {b328, b408, b504, b600, b712, b808, b936, b1000}, cb-Msg3-NumOfReplicas-r19 INTEGER(1..4), cb-Msg3-TimeResource-r19 SEQUENCE { pusch-Periodicity-r19 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128, sf256}, pusch-StartSFN-r19 INTEGER (0..1023), pusch-StartSubframe-r19 INTEGER (0..9) }, cb-Msg3-MPDCCH-Config-r19 CB-Msg3-MPDCCH-Config-r19, cb-Msg3-PUCCH-Config-r19 CB-Msg3-PUCCH-Config-r19, cb-Msg3-PUSCH-Config-r19 CB-Msg3-PUSCH-Config-r19, cb-Msg3-TxWindow-r19 SEQUENCE { windowStartSFN-r19 INTEGER (0..1023), windowStartSubframe-r19 INTEGER (0..9), windowSize-r19 ENUMERATED {FFS}, windowPeriodicity-r19 ENUMERATED {FFS} }  | 1. In procedural text, at least CP and UP indication can be added now. For example, AS security enabling is not applicable in CP solution.2. ConfigurationWe suggest remove redundancies.The cb-Msg3-TimeResource-r19 can be moved into cb-Msg3-TxWindow-r19. Start of PUSCH and start of window should be same. cb-Msg3-TxWindow-r19 SEQUENCE { windowStartSFN-r19 INTEGER (0..1023), windowStartSubframe-r19 INTEGER (0..9), windowSize-r19 ENUMERATED {FFS}, windowPeriodicity-r19 ENUMERATED {FFS},pusch-Periodicity-r19 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128, sf256} }[ZTE] We have same view as that “Start of PUSCH and start of window should be same”. But we disagree to move *cb-Msg3-TimeResource-r19* into *cb-Msg3-TxWindow-r19*, we prefer that they are separate definitions. Please see our comment in ZTE06. | 1. Is this solved by the new modelling?
2. I tend to agree with ZTE. The field description is updated to reflect that the window start is aligned with the PUSCH start.
 |
| SS01 | ***SystemInformationBlockType31* information element**-- ASN1STARTSystemInformationBlockType31-r17 ::= SEQUENCE { servingSatelliteInfo-r17 ServingSatelliteInfo-r17, lateNonCriticalExtension OCTET STRING OPTIONAL, ..., [[ servingSatelliteInfo-v1820 ServingSatelliteInfo-v1820 OPTIONAL -- Need OR ]], [[ t-ModeSwitching-r19 TimeOffsetUTC-r17 OPTIONAL -- Need OR ]]} | Introduce a ServingSatelliteInfo-v19xy in SystemInformationBlockType31(-NB). This helps to help to improve clarity and does not cost anything in terms of overhead.  | OK |
| SS02 | 1> if the SI message was not possible to decode from the accumulated SI message transmissions by the end of the SI-window, continue reception and accumulation of SI message transmissions on DL-SCH in the next SI-window occasion for the concerned SI message; | There was a discussion on this for release 17 for NTN-related SIBs, but there are similar issues for this for PWS-related SIB. If PWS is segmented to multiple SIBs, then the UE should not accumulate SI messages across SI-windows. This was probably not considered in the past as neither LTE-M nor NB-IoT was designed to receive PWS SIB. How to handle this needs to be discussed in an open issue.  | Not sure about the issue, e.g., this should be not specific to NB-IoT PWS? Since this was never discussed in PWS context, I suggest Samsung to bring a paper on this to clarify the issue to companies.  |
| SS03 | Section 5.2.1.3 | We believe that it would be useful for someone implementing NB-IoT PWS that the following agreement should be captured in some manner: Agreements:1. In case of PWS notification the network may release a RRC\_CONNECTED UE to idle, in case the UE reports the capability to receive PWS in idle (no other spec impact other than the introduction of a UE capability for supporting PWS reception in idle)An example could be: In RRC\_CONNECTED, BL UEs or UEs inCEor NB-IoT UEs are not required to acquire system information except when T311 is running, or upon handover where the UE is only required to acquire the *MasterInformationBlock* in the target PCell, or for UEs in CE to receive ETWS/CMAS information, or upon expiry of T317 where the UE is only required to acquire the *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT). For an NB-IoT UE capable of receiving ETWS/CMAS, the E-UTRAN may initiate connection release for UE to acquire ETWS/CMAS. In RRC\_IDLE, E-UTRAN may notify BL UEs or UEs inCEorNB-IoT UEs about SI update, ETWS and CMAS notification, and may notify BL UEs or UEs inCE about EAB modification and UAC modification, using Direct Indication information, as specified in 6.6 (or 6.7.5 in NB-IoT) and TS 36.212 [22]. | It was agreed with no spec impact except for the capability. |
| SS04 | cb-Msg3-MaxAttemptNum-r19 | It is more efficient to have a parameter range that includes the configurable values rather than relying on optionality. Remember that OPTIONAL costs one bit and makes ASN1 implementations more complicated. Better to have a parameter with 2^n values that is not optional, which includes all the values. We also think that n1 and n2 makes sense here as compared to preamble transmissions, as it keeps the latency low. So we propose the values [n1, n2, n3, n4, n5, n6, n8, n10] and that the field is not optional. Also there is an extreme comma “,” after the need-code.  | Naturally, if NW doesn’t configure a maximum number, UE send CB-MSG3 one time after initiating the procedure. So n1 doesn’t need to be configured. n2 is added. Overhead is not an issue, since optional can save many bits if the number is 1. |
| SS05 |  [[ npdsch-ConfigDedicated-v1900 NPDSCH-ConfigDedicated-NB-v1900 OPTIONAL -- Need ON ]] | Should be changed to np**u**sch-ConfigDedicated-v1900 | Agree |
| SS06vivo02 | CB-Msg3-EDT modelling | As we have discussed in the past, currently the introduction of CB-Msg3-EDT causes a lot of changes to duplicate CP/UP-EDT procedures. This is despite the fact that CB-Msg3-EDT is to a large degree a MAC-enhancement and that the higher layer procedures are largely the same – i.e same type of RRC messages and same type of content in the RRC messages. We think it is nevertheless an open issue that we think should be raised and discussed. **vivo additional comments:** similar view as Samsung. Changes in 5.3.3.2, 5.3.3.3b, 5.3.3.18 is not needed as the new CB-Msg3 is still covered by legacy EDT.[ZTE] We may have different view as vivo. Please see our suggestion in ZTE04 | See comments to MTK01 |
| SS07 |  | The following agreement does not seem to have been implemented: 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.It should be implemented in a similar fashion to section 5.3.3.3d: For CP transmission using PUR, upon indication from lower layers that transmission using PUR is successfully completed, the UE shall perform the actions as specified in 5.3.3.4b as if an empty *RRCEarlyDataComplete* message was received. | I guess this is reflected in Stage 2 procedure and MAC.Not sure any more impact to RRC. Can be discussed as one open issue |
| SS08 | 5.3.3.3b Actions related to transmission of *RRCEarlyDataRequest* messageThe UE shall set the contents of *RRCEarlyDataRequest* message as follows:. . .1> if the UE is a NB-IoT UE:2> if the UE supports DL channel quality reporting and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the carrier where the random access response is received as specified in TS 36.133 [16]; | It needs to be discussed how to deal with setting the cqi-NPDCCH field for CB-Msg3-EDT. Currently it is specified that the UE shall measure the random access response, but in CB-Msg3-EDT there is obviously no random access response. Either cqi-NPDCCH is not reported for CB-Msg3-EDT or it is specified that the UE uses CQI based on other measurements.[ZTE] Agree this is an issue for discussion.  | This is included as a MAC open issue. |
| SS09 | ***ta-Report***When this field is included in *SystemInformationBlockType2*, it indicates reporting of timing advance is enabled during Random Access due to RRC connection establishment, RRC connection resume or RRC connection reestablishment. When this field is included in *MobilityControlInfo*, it indicates TA reporting is enabled during Random Access due to handover, see TS 36.321 [6], clause 5.4.9. | According to the field description, it is not clear whether TAR MAC CE will be included for a CB-Msg3-EDT transmission, but in the current procedures a TAR MAC CE will be triggered for CB-Msg3-EDT as long as the ta-Report is configured. This is potentially wasteful as the UE will only transmit a short message. This should be added to the open issue list. [ZTE] we are a bit confused? For RRC spec, as it mentions “…it indicates reporting of timing advance is enabled during Random Access due to RRC connection establishment, RRC connection resume or RRC connection reestablishment”, we think TAR MAC CE would not be sent for CB-Msg3-EDT as there is no Random Access and also no RRC connection establishment, RRC connection resume or RRC connection reestablishment. So we think this part RRC spec has no issue? | Agree with ZTE comment. |
| ERI01 | Segmentation can be applied for the delivery of a secondary notification and, if present, the associated warning area coordinates. | Segmentation can be applied to the warning area coordinates only in the secondary notification. | Right, but this is mentioned in this sentence:Segmentation can be applied for the delivery of a secondary notification and, if present, the associated warning area coordinates. |
| ERI02 | For NB-IoT, the possible boundaries of modification for *SystemInformationBlockType1-NB* are defined by SFN values for which (H-SFN \* 1024 + SFN) mod 4096 = 0. | Similar to legacy, upon an emergency, the network should be able to update SIB1-NB regardless the modification period boundaries.  | Not quite follow this comment. Is it in Rel-19 IoT NTN scope? |
| ERI03 | 4> if the UE is in CE:5> start acquiring *SystemInformationBlockType10*; 4> else if the UE is an NB-IoT UE:5> start acquiring *SystemInformationBlockType10-NB immediately*; | A NB-IoT can operate in CE mode A or B. Thus, it would enter the first branch. In addition, RAN2 should discuss if the acquisition starts “immediately”.[ZTE] We are a bit confused? For NB-IoT, there is no concept of CE mode A or B. So we are fine with a separate branch for NB-IoT (original text) | Same view with ZTE. This is aligned with legacy description. |
| ERI04vivo03 | 1> forward the *t-ModeSwitching* to upper layers, if present. | It is uncertain whether upper layers make use of this parameter. We suggest waiting for the LS response from CT1.**vivo additional comment**: we are fine to keep this as this inforamtion may be used at the APP layer. In addition, the mode information is also intended to be indicated to determine the mode switching status. Merely having UTC timing info is insufficient to determine the mode switcing state (e.g. whether the switching is from S&F to regenerative or from regenerative to S&F). [ZTE] We may have similar view as vivo? Please see our suggestion in ZTE02 | Similar view with vivo that this can be kept. Which layer this is used can be UE implementation. For the mode information, I will add an open issue to discuss.  |
| ERI05 | ***sf-OperationIdication***Indicates that the cell is operating in Store and Forward mode. If this field is present, UEs supporting the Store and Forward operation ignores *cellBarred-NTN* and *cellBarred.* Value 'barred' means the cell is barred for NTN connectivity with the Store and Forward operation, as defined in TS 36.304 [4]. Value 'notBarred' means the cell allows UEs supporting the Store and Forward operation to access. If this field is absent, the NTN cell is operating in normal mode, i.e., not in the Store and Forward mode and UEs supporting the Store and Forward operation follow *cellBarred-NTN.* | The detailed description pertains 304. We prefer to simplify the text in 331. There is no need to capture both in 331 and 304 the UE behaviour upon each of the values that the parameter may take. | It would be more clear to have this in RRC description. So that we don’t need to check 304 each time for the meaning. |
| ERI06 | ]], [[ t-ModeSwitching-r19 TimeOffsetUTC-r17 OPTIONAL -- Need OR ]] | Following previous releases conventions, it could be included under the extension marker.  | Not quite follow this comment, i.e., it is already under the extension marker. See the comment SS01. |
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| Apple01 | Section 5.3.3.3a1> if the UE is initiating CB-Msg3 EDT in accordance with conditions in 5.3.3.1x; or | The same sentence is used for MO and MT access, it should be more specific on MO and MT. | This sentence is removed. See the new modeling in the CR.  |
| Apple02 | Section 6.7.3.2, IE CB-Msg3-ConfigSIB-NB | cb-Msg3-RSRP-CE-Level-NB-r19 can be renamed as a list. | See comment to MTK09 |
| Apple03 | Section 6.7.3.2, IE CB-Msg3-ConfigSIB-NB | I guess npusch-SubCarrierSetIndex-r19 should be a list, to indicate multiple frequency domain resources (as RAN1 also confirmed)? | Agree |
| Apple04 | Section 6.7.3.2, IE *PhysicalConfigDedicated-NB*[[ npdsch-ConfigDedicated-v1900 NPDSCH-ConfigDedicated-NB-v1900 OPTIONAL -- Need ON ]] | It should be npusch not npdsch. | Agree |
| Apple05 | Section 5.2.2.44> else if the UE is an NB-IoT UE:5> start acquiring *SystemInformationBlockType10-NB immediately*; | Why not just merge it to the bullet above? | Merge with “UE in CE” branch? There is no “immediately” for “UE in CE” |
| Apple06 | Section 5.3.3.18- the UE is initiating CB-Msg3 EDT in accordance with conditions in 5.3.3.1x; | It should be made clear this is only for UP because CP solution does not require early security reactivation. | This sentence is removed. See the new modeling in the CR. |
| Apple07 | Section 6.2.2, SystemInformationBlockType1***sf-OperationIdication*** | The name in field description is not the same as in ASN.1.[ZTE] Agree. *sf-OperationIdication* in the field description of SIB1 is a typo, it should be *sf-OperationMode* (no issue for SIB-NB) | OK |
| Apple08 | Section 6.4maxCE-Level-NB-r19 | It should be put into NB section 6.7.4 | OK |
| Apple09 | Section 6.7.3.1 SIB22-NBE-UTRAN includes the same number of entries, and listed in the same order, as in*CB-Msg3-ConfigList-NB* in *SystemInformationBlockType2-NB.* | This sentence should be better put into ***cb-Msg3-ProbabilityAnchorList-NB.*** | OK |
| Nokia01 | Section 5.2.2.41> if the UE is ETWS capable:2> upon entering a cell during RRC\_IDLE, following successful handover or upon connection re-establishment:3> discard any previously buffered *warningMessageSegment*; | Per agreement in last meeting, need to further discuss continued inter-cell PWS reception in intra-eNB scenario. | Will be listed as an open issue. |
| Nokia02 | – CB-Msg3-ConfigSIBCB-MSG3-MPDCCH-Config-r19 ::= SEQUENCE { mpdcch-Narrowband-r19 INTEGER (1..maxAvailNarrowBands-r13), | Whether the narrowband configuration should be defined as a set (not one single narrow band) has been raised to RAN1 in LS R2-2503175 question2. Since there is no consensus in RAN1 (LS response R1-2504905), RAN2 should further discuss the issue and take decision in next meeting. | My understanding on the following is that there is no need to define this as a set (i.e., it is only agreed to do if there is consensus): “There is no consensus in RAN1 on the need to define the set of narrowbands as a set”.But if there is issue, can be discussed based on company contribution. |
| ZTE01 | Suggest to align the following definition with those in TS 23.401:(TS 36.331 running CR):**Store and Forward Satellite operation mode**: An operation mode that provides to the UE a communication service when the serving satellite has a discontinuous connection to the NTN gateway and connection to the NTN gateway is not available when the satellite is interacting with the UE.(TS 23.401 V19.3.0 (2025-06)) :**Store and Forward Satellite operation:** An operation mode that provides to the UE a communication service when the serving satellite has a discontinuous connection to the ground network and such connection is not available when the satellite is interacting with the UE.**S&F Mode:** The mode in which the RAN and core network entities perform Store and Forward Satellite operation. | The differences between these two definition ways are marked with highlight yellow. As there is no other places to mention “ground network” in both TS 36.331 and TS 36.300, we prefer to follow TS 23.401, e.g., to copy the definitions in TS 23.401 to our TS 36.331 (maybe also other specs).We think it’s better to also have an abbreviated “S&F Mode” in our RRC spec and it can be used in the formal text to replace “Store and Forward Satellite operation mode”. We are fine to remove “and core network” in the “S&F Mode” definition in our RAN spec, if Rapp thinks necessary, but also fine to keep same as that in TS 23.401. | This was commented by QC that “ground network” is not clear from RAN perspective so it was changed. Since “Store and Forward Satellite operation mode” is already used in the text, I think the abbreviation is not needed for now.  |
| ZTE02 | 5.2.2.39 Actions upon reception of *SystemInformationBlockType31*Upon receiving *SystemInformationBlockType31* (*SystemInformationBlockType31-NB*), the UE shall:1. start or restart timer T317 with the duration *ul-SyncValidityDuration* from the subframe indicated by *epochTime*.
2. forward the *t-ModeSwitching* to upper layers, if present.
 | This *t-ModeSwitching* time information is bidirectional, without other information, the NAS cannot identify what’s the real meaning of this parameter. So it’s needed to also forward parameter *sf-OperationMode* in SIB1 to the higher level simultaneously.  | See comment to ERI04 |
| ZTE03 | 5.3.3.1x Conditions for initiating CB-Msg3 EDT in NTN…………..1. the UE supports CB-Msg3 EDT, and the corresponding [FFS parameter name] is included in SystemInformationBlockType2 (*SystemInformationBlockType2-NB* and/or *SystemInformationBlockType22-NB* in NB-IoT);

………………………. | The parameter name already exists and can be filled in.**5.3.3.1x** Conditions for initiating CB-Msg3 EDT in NTNA BL UE, UE in CE Mode A or NB-IoT UE can initiate CB-Msg3 EDT transmission when all of the following conditions are fulfilled:………………1. the UE supports CB-Msg3 EDT, and the ~~corresponding [FFS parameter name]~~ *cb-Msg3-ConfigSIB* parameter is included in *SystemInformationBlockType2* (*SystemInformationBlockType2-NB* and/or *SystemInformationBlockType22-NB* in NB-IoT);

………………We also think such configuation can be an implicit NW capability, so it’s no need to additionally introduce explicit NW capability indication in SIB. | Agree |
| ZTE04 | For CB-Msg3-EDT modelling issue and also try to address the comment [SS06].**5.3.3.1x** Conditions for initiating CB-Msg3 EDT in NTNA BL UE, UE in CE Mode A or NB-IoT UE can initiate CB-Msg3 EDT transmission when all of the following conditions are fulfilled:…………..**5.3.3.2** Initiation……………….2> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b; or2> if the UE is initiating CB-Msg3 EDT in accordance with conditions in 5.3.3.1x; or2> if the UE is initiating CP transmission using PUR in accordance with conditions in 5.3.3.1c:3> initiate transmission of the *RRCEarlyDataRequest* message in accordance with 5.3.3.3b;2> else:3> initiate transmission of the *RRCConnectionRequest* message in accordance with 5.3.3.3;……………………**5.3.3.3a** Actions related to transmission of *RRCConnectionResumeRequest* messageIf the UE is resuming the RRC connection from a suspended RRC connection, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:1> if the UE is a NB-IoT UE; or1> if the UE is initiating UP-EDT for mobile originating calls in accordance with conditions in 5.3.3.1b; or1> if the UE is initiating CB-Msg3 EDT in accordance with conditions in 5.3.3.1x; or1> if the UE is initiating UP transmission using PUR in accordance with conditions in 5.3.3.1c; or1> if field *useFullResumeID* is signalled in *SystemInformationBlockType2*:2> if the UE connected to 5GC is a BL UE or UE in CE:3> set the *fullI-RNTI* to the stored *fullI-RNTI*; | At least now, we are generally fine with the current description on the condition in 5.3.3.1x and think not so necessary to differentiate CB-Msg3 EDT for CP and UP.Also with reference to the description in TS 36.300 running CR where we already can accept merging the CB-Msg3-EDT procedure into MO-EDT/MT-EDT sections, we think in 36.331 we could describe CB-Msg3-EDT procedure as being somewhat related to CP-EDT/UP-EDT, so that most places mentioning CP-EDT/UP-EDT would not need additional descriptions for CB-Msg3-EDT procedure. However, we recommend still keeping 5.3.3.1x as a separate section (to avoid changes to the existing section 5.3.3.1b), and at the same time keeping the current changes already added by Rapp indicating the initiations of CB-Msg3-EDT procedures.The suggested changes can be as the following examples:**5.3.3.1x** Conditions for initiating ~~CB-Msg3 EDT~~ CB-Msg3-EDT procedure in NTNA BL UE, UE in CE Mode A or NB-IoT UE can initiate ~~CB-Msg3 EDT transmission~~ CB-Msg3-EDT procedure for CP-EDT or UP-EDT when all of the following conditions are fulfilled:…………..**5.3.3.2** Initiation……………….2> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b; or2> if the UE is initiating ~~CB-Msg3 EDT~~ CB-Msg3-EDT procedure for CP-EDT in accordance with conditions in 5.3.3.1x; or2> if the UE is initiating CP transmission using PUR in accordance with conditions in 5.3.3.1c:3> initiate transmission of the *RRCEarlyDataRequest* message in accordance with 5.3.3.3b;2> else:3> initiate transmission of the *RRCConnectionRequest* message in accordance with 5.3.3.3;……………………**5.3.3.3a** Actions related to transmission of *RRCConnectionResumeRequest* messageIf the UE is resuming the RRC connection from a suspended RRC connection, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:1> if the UE is a NB-IoT UE; or1> if the UE is initiating UP-EDT for mobile originating calls in accordance with conditions in 5.3.3.1b; or1> if the UE is initiating ~~CB-Msg3 EDT~~ CB-Msg3-EDT procedure for UP-EDT in accordance with conditions in 5.3.3.1x; or1> if the UE is initiating UP transmission using PUR in accordance with conditions in 5.3.3.1c; or1> if field *useFullResumeID* is signalled in *SystemInformationBlockType2*:1. if the UE connected to 5GC is a BL UE or UE in CE:

3> set the *fullI-RNTI* to the stored *fullI-RNTI*; | See comment to MTK01 |
| ZTE05 | cb-Msg3-MaxAttemptNum-r19 | We think this parameter can be defined in a common place, e.g., outside the configuration per-CE level.For the value range, we are generally fine with MTK05, e.g., to make this parameter optional and start from n2. Maybe also 2^n values can be used as suggested by SS04. | It is agreed the attempt number is per CE level. |
| ZTE06 | CB-Msg3-Config-r19 ::= SEQUENCE { cb-Msg3-TBS-r19 ENUMERATED {b328, b408, b504, b600, b712, b808, b936, b1000}, cb-Msg3-NumOfReplicas-r19 INTEGER(1..4), cb-Msg3-TimeResource-r19 SEQUENCE { pusch-Periodicity-r19 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128, sf256}, pusch-StartSFN-r19 INTEGER (0..1023), pusch-StartSubframe-r19 INTEGER (0..9) }, cb-Msg3-MPDCCH-Config-r19 CB-Msg3-MPDCCH-Config-r19, cb-Msg3-PUCCH-Config-r19 CB-Msg3-PUCCH-Config-r19, cb-Msg3-PUSCH-Config-r19 CB-Msg3-PUSCH-Config-r19, cb-Msg3-TxWindow-r19 SEQUENCE { windowStartSFN-r19 INTEGER (0..1023), windowStartSubframe-r19 INTEGER (0..9), windowSize-r19 ENUMERATED {FFS}, windowPeriodicity-r19 ENUMERATED {FFS} } OPTIONAL, --Need OP cb-Msg3-ResponseWindow-r19 ENUMERATED {sf240, sf480, sf960, sf1920, sf3840, sf5760, sf7680, sf10240}, cb-Msg3-MaxAttemptNum-r19 ENUMERATED {n3, n4, n5, n6, n7, n8, n10} OPTIONAL, --Need OP, ...}----- | We see no clear necessity to define a separate *windowStartSFN-r19/windowStartSubframe-r19* which are different from the point of first (N)PUSCH resource (*pusch-StartSFN-r19/pusch-StartSubframe-r19*). With this definition way, 14bits for windowStartSFN-r19/windowStartSubframe-r19 will be consumed. So we suggest to align *windowStartSFN-r19/windowStartSubframe-r19* with *pusch-StartSFN-r19/pusch-StartSubframe-r19.* That is, it’s no need to define *windowStartSFN-r19/windowStartSubframe-r19* and they can be same as *pusch-StartSFN-r19/pusch-StartSubframe-r19*.[Qualcomm] We should just follow the agreement, it is about transmission window start, length and periodicity.* For CB-msg3-EDT, the transmission window can be configured by the network with a starting point (e.g. H-SFN offset), a window length, and a window periodicity (window length and periodicity could be the same).
* The start of CB-msg3 EDT transmission window is aligned with the start of time domain (N)PUSCH resource.

Moreover, for the FFS for *windowPeriodicity-r19*, considering that the purpose of defining TxWindow is to provide multiple PUSCH opportunities for the UE to transmit replicas and also with consideration on saving signaling overhead, we prefer to define the number of PUSCH periodicities as the *windowPeriodicity-r19*, instead of using a value of time period which may need to be large.  | AgreeFor the periodicity and window length, it will be discussed in the open issue list. |
| ERI07 | 1. the upper layers request establishment of an RRC connection; or the upper layers request resumption of an RRC connection and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;
2. the UE supports CB-Msg3 EDT, and the corresponding *[FFS parameter name]* is included in *SystemInformationBlockType2 (SystemInformationBlockType2-NB* and/or *SystemInformationBlockType22-NB* in NB-IoT);
 | This is ambiguous and not maintainable. Its much clearer to split first conditionon two lines to make clear exactly what is meant and when it applies (like in EDT initialization) and combine with second conditions. Something like:1> the UE supports CB-Msg3 EDT and:2> for CP-EDT, the upper layers request establishment of an RRC connection, the UE supports CP-EDT, and *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *[FFS parameter name]*; or2> for UP-EDT, the upper layers request resumption of an RRC connection, the UE supports UP-EDT, *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *[FFS parameter name]*, and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure; | OK. Please check the updated CR. |
| ERI08 | **whether to model CB-Msg3 EDT as one sub-category of legacy EDT or as a separate concept in a separate section** | Its much simpler to model CB-Msg3 EDT as one subcategory of legacy EDT. **Early Data Transmission:** Allows one uplink data transmission optionally followed by one downlink data transmission during the random access procedure or during the CB-Msg3-EDT procedure, as specified in TS 36.300 [9] clause 7.3b. The S1 connection is established or resumed upon reception of the uplink data and may be released or suspended along with the transmission of the downlink data. Early data transmission refers to both CP-EDT and UP-EDT.Whenever EDT is used the meaning of EDT is either EDT using random access procedure or EDT using CB-Msg3-EDT procedure. Thus, without any further changes – the terms in the RRC spec becomes Perform EDT = perform EDT via RA procedure or via CB-Msg3-EDT procedureCP-EDT = CP-EDT via RA procedure or via CB-Msg3-EDT procedureUP-EDT = UP-EDT via RA procedure or via CB-Msg3-EDT procedure That solves all 25 places where CB-Msg3 EDT is added where it says “Perform EDT”, “CP-EDT”, and “UP-EDT”. Then to avoid updating the 17 places with references to 5.3.3.1b, we can move the stuff that is now in 5.3.3.1x to be a special case of 5.3.3.1b.Like this (just minor marked changes to 5.3.3.1x to make the text fit as a subsection of in 5.3.3.1b):5.3.3.1b        Conditions for initiating EDTA BL UE, UE in CE or NB-IoT UE can initiate EDT using the random access procedure when all of the following conditions are fulfilled:1> if the UE is connected to EPC:2> for CP-EDT, the upper layers request establishment of an RRC connection, the UE supports CP-EDT, and *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *cp-EDT*; or2> for UP-EDT, the upper layers request resumption of an RRC connection, the UE supports UP-EDT, *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *up-EDT*, and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;1> else if the UE is connected to 5GC:2> for CP-EDT, the upper layers request establishment of an RRC connection, the UE connected to 5GC supports CP-EDT, and *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *cp-EDT-5GC*; or2> for UP-EDT, the upper layers request resumption of an RRC connection, the UE connected to 5GC supports UP-EDT, *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *up-EDT-5GC*, and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;1> the establishment or resumption request is for mobile originating calls and the establishment cause is *mo-Data* or *mo-ExceptionData* or *delayTolerantAccess*; or1> the establishment or resumption request is for mobile terminating calls, the UE has a stored *mt-EDT* indication and the establishment cause is *mt-Access*;1> the establishment or resumption request is suitable for EDT as specified in TS 36.300 [9], clause 7.3b.1;1> *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *edt-Parameters*;1> for mobile originating calls, the size of the resulting MAC PDU including the total UL data is expected to be smaller than or equal to the TBS signalled in *edt-TBS* as specified in TS 36.321 [6], clause 5.1.1;1> EDT fallback indication has not been received from lower layers for this establishment or resumption procedure;NOTE 1: Upper layers request or resume an RRC connection. The interaction with NAS is up to UE implementation.NOTE 2: It is up to UE implementation how the UE determines whether the size of UL data is suitable for EDT.In NTNs, a BL UE, UE in CE Mode A or NB-IoT UE can initiate EDT using the CB-Msg3 EDT procedure ~~transmission~~  when all of the following conditions are fulfilled:1> the UE supports CB-Msg3 EDT and:2> for CP-EDT, the upper layers request establishment of an RRC connection, the UE supports CP-EDT, and *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *[FFS parameter name]*; or2> for UP-EDT, the upper layers request resumption of an RRC connection, the UE supports UP-EDT, *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *[FFS parameter name]*, and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;1. ~~the UE supports CB-Msg3 EDT, and~~ *~~SystemInformationBlockType2 (SystemInformationBlockType2-NB~~* ~~in NB-IoT) includes the corresponding~~ *~~[FFS parameter name]~~*~~;~~

1>    the establishment cause is *mo-Data* or *mo-ExceptionData* or *delayTolerantAccess*; or the UE has a stored *mt-EDT* indication and the establishment cause is *mt-Access*;1>    the establishment or resumption request is suitable for CB-Msg3 EDT as specified in TS 36.300 [9], clause X;1. the measured RSRP satisfies the conditions specified in TS 36.321 [6], clause X;

1>    the size of the resulting MAC PDU including the total UL data is expected to be smaller than or equal to the TBS signalled in *[FFS parameter name]*, as specified in TS 36.321 [6], clause X;Editor’s Note 2: The above conditions may need update based on more progress on the CB-Msg3 EDT discussion, e.g., FFS whether to differentiate CB-Msg3 EDT for CP and UP and FFS on the fallback indication.NOTE 3~~1~~:            Upper layers request or resume an RRC connection. The interaction with NAS is up to UE implementation.NOTE 4~~2~~:            It is up to UE implementation how the UE determines whether the establishment or resumption request ~~the size of UL data~~ is suitable for CB-Msg3 EDT.With this modelling in RRC, we avoid changes to the 42 (25 plus 17) places where CB-Msg3-EDT will need to be added with the current modelling. Spec benomes clearer and more maintainable. | OK. Please check the updated CR. |
| ERI09 | 5.3.3.3a Actions related to transmission of *RRCConnectionResumeRequest* messageIf the UE is resuming the RRC connection from a suspended RRC connection, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:1> if the UE is a NB-IoT UE; or1> if the UE is initiating UP-EDT for mobile originating calls in accordance with conditions in 5.3.3.1b; or1> if the UE is initiating CB-Msg3 EDT in accordance with conditions in 5.3.3.1x; or | The change here (and in many many other places) implies CB-Msg3 EDT is a UP-EDT procedure – this is not correct. Easilly solved by proposal to previous problem ERI08.  | OK. Please check the updated CR. |
| Qualcomm-2 | CB-Msg3-Config-r19 ::= SEQUENCE { cb-Msg3-TBS-r19 ENUMERATED {b328, b408, b504, b600, b712, b808, b936, b1000}, | This has not been discussed and simply imported from the EDT. We think we should also discuss what is the minimum TBS size allowed for DSA, for example, whether 144 bits TBS is possible.Also, multiple TBS sizes as in EDT should be considered. | Will be added as an open issue. |
| Qualcomm-3 | 5.3.3.1x Conditions for initiating CB-Msg3 EDT in NTNA BL UE, UE in CE Mode A or NB-IoT UE can initiate CB-Msg3 EDT transmission when all of the following conditions are fulfilled:1. the upper layers request establishment of an RRC connection; or the upper layers request resumption of an RRC connection and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;
2. the UE supports CB-Msg3 EDT, and the corresponding *[FFS parameter name]* is included in *SystemInformationBlockType2 (SystemInformationBlockType2-NB* and/or *SystemInformationBlockType22-NB* in NB-IoT);

1> the establishment cause is *mo-Data* or *mo-ExceptionData* or *delayTolerantAccess*; or the UE has a stored *mt-EDT* indication and the establishment cause is *mt-Access*; | We should also discuss whether MO signaling is allowed for DSA. Just for performing tracking area update, UE does not have to transition to connected mode. | Any issue on this since it is supported for legacy EDT?If there is an issue, it can be based on company contribution. |

1. Second Round: Open issue discussion

**RRC-1: Discussion on the implementation of the RRC running CR.**

Please provide comments/suggestions regarding the following parameters/agreements in the table.

|  |  |  |
| --- | --- | --- |
| Sub-issue number | Parameters/agreements | Issue to be discussed |
| 1.1 | (Comment MTK08)CB-Msg3-ProbabilityAnchorList-NB-r19 | Whether this should be per CE level as in current running CR or per anchor carrier? |
| 1.2 | (Comment SS07)=> A CB-Msg4 without RRC message (but with contention resolution identity) is allowed as the complete response to the CB-Msg3 in CP solution. | Whether this has any impact to RRC CR? |
| 1.3 | (Comment QC2)cb-Msg3-TBS-r19 ENUMERATED {b328, b408, b504, b600, b712, b808, b936, b1000}, | Whether does the value range need to be different from legacy EDT? If yes, what would be the suitable values? |
| 1.4 |  windowSize-r19 ENUMERATED {FFS}, windowPeriodicity-r19 ENUMERATED {FFS} | what would be the suitable values for these parameters for eMTC and NB-IoT, respectively? |
| 1.5 | eMTC: prb-AllocationInfoSet-r19 SEQUENCE (SIZE(1..FFS)) OF BIT STRING (SIZE(10)),NB-IoT:npusch-SubCarrierSetList-r19 SEQUENCE (SIZE(1..FFS)) OF NPUSCH-SubCarrierSet-r19, | what would be the suitable values for these value ranges? |

**Company comments:**

|  |  |  |
| --- | --- | --- |
| Company | Sub-issue number  | Comments/Suggestions |
| Google | 1.2 | We share the same view as SS07 that UE shall perform the actions in 5.3.3.4b as if an empty RRCEarlyDataComplete is received by the UE. Because the CB-Msg3-EDT is triggered by “the upper layers request establishment of an RRC connection” (in sub-clause 5.3.3.1b), at least the following two steps in 5.3.3.4b need to be performed.1> indicate to upper layers that the RRC connection has been established1> indicate the release of the RRC connection to upper layers together with the release cause 'other', upon which the procedure ends; |
| MediaTek | 1.1 | To clarify, we are also fine to follow legacy and define this as per CE level. Just want to confirm with companies’ understanding. |
| MediaTek | 1.2 | Similar to PUR, RRC needs to process successful and unsuccessful CB-Msg3 transmission indications.* Successful CB-Msg3 transmission indication means CMR reception is successful, C-RNTI is not included in the CB-Msg4 and there is no corresponding MAC SDU (i.e. L2 ACK). In this case, RRC can end CB-Msg3-EDT. (Note that we also realize that the MAC specification should be updated further to provide RRC successful indication only in case of L2 ACK)
* Unsuccessful CB-Msg3 transmission indication means CB-Msg3 transmission has failed after the maximum number of re-attempts. In this case, RRC can also end CB-Msg3-EDT.

We think something like 5.3.3.3b for PUR is also needed for CB-MSG3-EDT5.3.3.3x UE actions upon receiving CB-MSG3-EDT indications from lower layersThe UE shall:For CP transmission using CB-MSG3-EDT, upon indication from lower layers that transmission of CB-MSG3 is successfully completed, the UE shall perform the actions as specified in 5.3.3.4b as if an empty *RRCEarlyDataComplete* message was received.Upon reception of CB-MSG3-EDT failure indication from lower layers, the procedure ends.NOTE: [FFS] Further UE actions upon reception of CB-MSG3-EDT failure indication from lower layers (see TS 36.321 [6]) is left up to implementation. |
| MediaTek | 1.3 | There should be no difference in TB size between the legacy EDT and CB-Msg3-EDT.Following legacy should be OK. |
| MediaTek | 1.4 | The transmission window size and window periodicity should be configured in units of PUSCH resource periodicity. The candidate components of CB-Msg3 transmission window size can be 1,2,4,8,16,32The candidate components of CB-Msg3 transmission window periodicity can be 1,2,4,8,16,32Furthermore, we could make the CB-Msg3 transmission window size optional. If it is absent, the value of window periodicity is used. |
| MediaTek | 1.5 | Since the single tone 3.75K SCS NPUSCH is supported, the maximum value of NPUSCH subcarrier should be 48. |

**RRC-2: Whether to allow skipping reading SIB1-NB to shorten the latency of PWS acquisition.**

**Issue description:**

During RAN2#128, the following FFS was left:

* **We will extend the existing ETWS/CMAS notification RRC procedures for eMTC to NB-IoT. FFS if SIB1-NB acquisition is needed**

**Rapporteur suggestion:** This issue was not discussed in the last meeting. It can be further discussed based on company contributions in the next meeting.

**Proposal 1: (RRC-2) RAN2 to discuss whether to allow the UE to skip reading SIB1-NB to shorten the latency of PWS acquisition.**

**RRC-3: Whether to allow UE to receive and assemble PWS segments from different cells during mobility.**

**Rapporteur suggestion:** According to the agreements from last meeting, proponent companies can provide TPs for discussion in their contributions.

1. 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

**Proposal 2: (RRC-3) RAN2 to discuss whether to allow UE to receive and assemble PWS segments from different cells during mobility based on proponent’s TP.**

**RRC-4: Whether to forward mode information to the upper layer.**

Some companies think it should be useful for the UE to forward the information of the current working mode to the upper layers (e.g., app layer), following similar logic with the mode transition time.

**Proposal 3: (RRC-4) RAN2 to discuss whether the information of current working mode should be forwarded to upper layers after SI acquisition.**

1. Summary