3GPP TSG-RAN WG2 Meeting #109bis-e [R2-2003804](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003804.zip)

**Electronic, 20 April – 30 April 2020**

Source: Session Chair (InterDigital)

Title: Session minutes for NR-U, Power Savings and 2-step RACH

**Organizational:**

1. LSs – contact companies should flag LSs that need presenting. Otherwise we will directly note them
2. Only Email discussions and summary discussions will be treated during e-meetings (indicated clearly in the meeting notes)
3. All organization emails and notes will be shared over the following email discussion throughout the two meeting weeks:

* [AT109bis-e][500] Organizational Diana - NR-U, 2-step RACH, Power Savings

Scope:

* + - Share plans for the meetings and list of ongoing email discussions for the sessions related to NR-U, 2-step RACH, and power saving
    - Share meetings notes and agreements for review and endorsement

**Email discussions:**

* [AT109bis-e][501][NR-U] CP Open and ASN.1 Issues (Qualcomm)

Scope:

* + - Identify/Summarize all remaining/identified CP and ASN.1 issues

Intended outcome:

* + - Set of proposals to agree by email
    - CR capturing agreements from week1 and then week2

Deadline for providing comments:

* + - Companies input: April 22nd
    - Rapporteur proposals: April 23rd
    - CR capturing agreements: April 27th
* [AT109bis-e][502][NR-U] UP Open Issues (InterDigital, Ericsson)

Scope:

* + - Identify/Summarize all remaining/identified UP issues

Intended outcome:

* + - Set of proposals to agree by email (InterDigital)
    - CR capturing agreements from week1 and then week2 (Ericsson)

Deadline for providing comments:

* + - Companies input: April 22nd
    - Rapporteur proposals: April 23rd
    - CR capturing agreements: April 27th
* [AT109bis-e][503][2s RA] UP Open Issues (ZTE)

Scope:

* + - Identify/Summarize all remaining/identified UP issues

Intended outcome:

* + - Set of proposals to agree by email
    - CR capturing agreements from week1 and then week2

Deadline for providing comments:

* + - Companies input: April 21st
    - Rapporteur proposals: April 22nd to be discussed in week1 discussion.
    - CR capturing agreements: April 27th
* [AT109bis-e][504][NR-U] CP/UE assistance Open and ASN.1 Issues (Mediatek)

Scope:

* + - Identify/Summarize all remaining/identified CP UE assistance and ASN.1 issues

Intended outcome:

* + - Set of proposals to agree by email
    - CR capturing agreements from week1 and then week2

Deadline for providing comments:

* + - Companies input: April 22nd
    - Rapporteur proposals: April 23rd
    - CR capturing agreements: April 27th
* [AT109bis-e][505][PowSav] RRM Open Issues (CATT, Vivo)

Scope:

* + - Identify/Summarize all remaining/identified RRM issues (continuation of pre-meeting email discussion)

Intended outcome:

* + - Set of proposals to agree by email (CATT)
    - CR capturing agreements from week1 and then week2 (Vivo)

Deadline for providing comments:

* + - Companies input: April 22nd
    - Rapporteur proposals: April 23rd
    - CR capturing agreements: April 27th
* [AT109bis-e][506][PowSav] DCP Open Issues (InterDigital, Huawei)

Scope:

* + - Identify/Summarize all remaining/identified DCP issues (continuation of pre-meeting email discussion)

Intended outcome:

* + - Set of proposals to agree by email (InterDigital)
    - CR capturing agreements from week1 and then week2 (Huawei)

Deadline for providing comments:

* + - Companies input: April 22nd
    - Rapporteur proposals: April 23rd
    - CR capturing agreements: April 27th
* [AT109bis-e][507][2s RA] CP and ASN.1 Issues (Ericsson)

Scope:

* + - Identify/Summarize all remaining/identified CP and ASN.1 issues

Intended outcome:

* + - Set of proposals to agree by email
    - CR capturing agreements from week1 and then week2

Deadline for providing comments:

* + - Companies input: April 22nd
    - Rapporteur proposals: April 23rd
    - CR capturing agreements: April 27th
* [AT109bis-e][508][NR-U] CR to 36.331 for NR-U (Qualcomm)

Scope:

* + - Review running 36.331 CR

      Intended outcome:

* + - Agreed CR for 36.331

      Deadline for providing comments – April 24th

# 6 Rel-16 NR Work Items

## 6.2 NR-based Access to Unlicensed Spectrum

(NR\_unlic-Core; leading WG: RAN1; REL-16; started: Dec 18; target; June 20; WID: [RP-192](file:///C:\Data\3GPP\Extracts\RP-191575%20Revised%20WID%20NR-U.doc)926; SR; RP-200459, Further prioritization guidance in RP-191581). Documents in this agenda item will be handled in a break out session.

Time budget: 3 TU

Tdoc Limitation: 3

### 6.2.1 General

Including incoming LSs, rapporteur inputs, etc.  
Contributions in this AI are reserved for WI rapporteur inputs and/or spec rapporteur inputs and do not count towards the tdoc limits. All comments related to 38.300, 38.304 should be given to Ozcan, spec rapporteur. Qualcomm will produce a document with the received issues and update the CR directly

Including [Post109e#40][NR-U] UE capabilities (Qualcomm, Vivo)

No contributions are expected for UE capabilities. Please provide your input to the email discussion. Vivo is expected to produce first draft of 38.304

[R2-2002506](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002506.zip) LS to RAN2 on NR-U related changes for 38.300 running CR (R1-2001300; contact: Qualcomm) RAN1 LS in Rel-16 NR\_unlic-Core To:RAN2

=> Noted

[R2-2002513](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002513.zip) LS on SSB index and candidate SSB index for NR-U (R1-2001357; contact: Samsung, Charter Communications) RAN1 LS in Rel-16 NR\_unlic-Core To:RAN2, RAN4

=> Noted

[R2-2002514](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002514.zip) LS on NR-U enhancements to initial access procedures (R1-2001375; contact: Charter Communications) RAN1 LS in Rel-16 NR\_unlic-Core To:RAN2

=> Noted

**To be treated**

[R2-2002516](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002516.zip) Reply LS on consistent Uplink LBT failure detection mechanism (R1-2001397; contact: Nokia) RAN1 LS in Rel-16 NR\_unlic-Core To:RAN2

=> Noted

[R2-2003008](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003008.zip) Reply LS on consistent Uplink LBT failure detection mechanism Nokia LS out Rel-16 NR\_unlic-Core To:RAN1 Late

- Huawei thinks that we may need to consider case by case

- Nokia thinks that we should always indicates if configured. Qualcomm thinks that the LS is clear already, if configured we always indicate and if not configured the cases are already in the LS.

=> The LS is revised in [R2-2003965](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003965.zip)

[R2-2003965](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003965.zip) Reply LS on consistent Uplink LBT failure detection mechanism Nokia LS out Rel-16 NR\_unlic-Core To:RAN1 Late

[R2-2002530](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002530.zip) LS on UL LBT failure recovery for the target cell (R4-2002282; contact: Ericsson) RAN4 LS in Rel-16 NR\_unlic-Core To:RAN2 Cc:RAN1

=> Noted

**To be treated at the end of the session**

[R2-2002844](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002844.zip) Report of Post109e#40][NR-U] UE capabilities Qualcomm Incorporated report

- Mediatek is concerned that if LBT consistent failure is option then we’d have to solve the issue. ZTE has the same view. Samsung also agrees.

**Agreements**

1: An indication from PHY to MAC on LBT failure or success should be supported by all NR-U UEs. How this can be grouped with other essential PHY layer NR-U capabilities can be discussed after RAN1 progress on those.

2: [CB] Detecting consistent LBT failure and recovery is optional and as a baseline the UE capability is per UE. Whether the signalling is per band will depend on RAN1 discussion.

[CB]

Proposal 3: As a baseline, the capability for LBT detection and recovery capability applies to all cells (SpCell and SCells).

Proposal 4: If a separate capability for SCell LBT detection and recovery is introduced, this will apply to all configured SCells.

Proposal 5: RAN2 should not further discuss the granularity of RSSI/CO measurements until RAN1 discussion concludes.

Proposal 6: RAN2 should not further discuss the granularity of configured grant autonomous transmission support until RAN1 discussion concludes.

Proposal 7: As a baseline, no separate capability is needed for sharing of HARQ processes among multiple configured grants with retransmission timer.

Proposal 8: As baseline, it is mandatory to support monitoring the last two bits of SFN for RACH operation in shared spectrum.

Proposal 9: When msg2/msB is transmitted on shared spectrum, the gNB signals the last 2 bits of SFN when ra-ResponseWindow-r16 is configured with value greater than 10ms; other cases are FFS.

Proposal 10: Multiple PDCCH monitoring occasions for PO is only used for NR operation with shared spectrum channel access.

Proposal 11: As a baseline, white lists for neighbour cells broadcast in SIB are only applicable to NR operation with shared spectrum channel access.

Proposal 12: From RAN2 point of view, retransmission timer for configured grant is used for only NR operation with shared spectrum channel access.

[R2-2002586](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002586.zip) Running CR to 38.306 on Introducing UE Capability for NR Shared Spectrum vivo CR Rel-16 38.306 16.0.0 0266 - B NR\_unlic-Core Withdrawn

[R2-2002584](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002584.zip) Running CR to 38.306 on Introducing UE Capability for NR Shared Spectrum vivo draftCR Rel-16 38.306 16.0.0 B NR\_unlic-Core

[R2-2004166](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2004166.zip) LS response on NR coexistence (R1-2002899; contact: Qualcomm)

### 6.2.2 User plane

*Including [Post109e#39][NR-U] MAC open issues (Ericsson)*

*Contributions related to issues addressed by the email discussions should be avoided and are discouraged for this AI.*

*All identified critical open issues should be provided to the rapporteur via email discussion Post109e#39 and new contributions on those topics are discouraged. Contributions should be reserved for more complicated issued.*

*No individual company CRs should be submitted*

**To be treated**

[R2-2003411](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003411.zip) Post109e#39 NR-U MAC open issues Ericsson discussion Rel-16 NR\_unlic-Core

=> Revised in [R2-2003951](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003951.zip)

[R2-2003951](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003951.zip) Post109e#39 NR-U MAC open issues Ericsson discussion Rel-16 NR\_unlic-Core

***5:*** *Consistent LBT failure is cancelled if lbt-FailureRecoveryConfig IE is reconfigured for any Serving Cell.*

**-** LG thinks that it is too aggressive to always cancel and suggest to cancel if LBT instance max count is greater than old one. Ericsson thinks that this is a rare event and we don’t need to do anything.

**-** Nokia asks if LBT failure is cancelled for all cells or just the ones that have been reconfigured. Qualcomm explains that the configuration is per MAC and not per Cell.

**6:** The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for consistent LBT failure, which has no valid PUCCH resources configured, for the Serving Cell that triggered the consistent LBT failure

**-** Futjistu wonders about the first two conditions. Huawei sympathizes with Futjitsu LG points out that they have a paper to capture general procedures that is being treated in main session and detailed discussion don’t have to take place.

- Nokia prefers to not go into this details and it cannot be implemented this way.

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| **Agreements**  **1:** Remove the addition of a third type of retransmissions for Type 1 and Type 2 configured grant when cg\_RetransmissionTimer is configured in the first paragraph of 5.8.2.  **2:** Change the last paragraph in 5.8.2 from  Retransmissions are done by:  -    repetition of configured uplink grants; or  -    receiving uplink grants addressed to CS-RNTI; or  -    retransmission on configured uplink grants.  To:  Retransmissions use:  -    repetition of configured uplink grants; or  -    received uplink grants addressed to CS-RNTI; or  -    configured uplink grants with *cg-RetransmissionTimer* configured.  **3:** Remove “the active UL BWP of” and add “if” in 5.21.2  1> if consistent LBT failure is triggered and not cancelled in the active UL BWP of the SpCell; and  1> if the Random Access procedure is considered successfully completed (see clause 5.1) in the SpCell:  **4:** Reset the *LBT\_COUNTER* when a consistent LBT failure is cancelled in 5.21.2.  **5:** Consistent LBT failure is cancelled if lbt-FailureRecoveryConfig IE is reconfigured.  **6:** FFS to be moved to email discussion - The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for consistent LBT failure, which has no valid PUCCH resources configured, for the Serving Cell that triggered the consistent LBT failure, if:   * an RRC (re-)configuration for BWP switching is received for this Serving Cell; or * a PDCCH for BWP switching is received for this Serving Cell; or * this Serving Cell is an SCell that is deactivated (see clause 5.9); or * a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response, regardless of LBT failure indication from lower layers, and the MAC PDU includes an LBT failure MAC CE that indicates consistent LBT failure for this Serving Cell. |

[R2-2003409](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003409.zip) Corrections of NR-U in 38.321 Ericsson CR Rel-16 38.321 16.0.0 0726 - F NR\_unlic-Core

- LG is concerned that a description is too long

=> The CR will be updated, delete proposal 6 and further comments can be provided via email discussions

[R2-2003952](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003952.zip) Outcome of [AT109bis-e][502][NR-U] UP Open Issues Interdigital

**To be confirmed**

**Agreements**

1 Proposal 4: UE PHY provides LBT failure indications for all uplink transmissions when lbt-FailureRecoveryConfig is not configured (same behavior as when it is configured). Include this in the reply LS to RAN1 (15/18)

2 Proposal 5: Change the modeling of capturing LBT failure indication in TS 38.321 per draft CR [R2-2003050](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003050.zip), by removing “regardless of LBT failure indication from lower layers” and not tying “transmission” to LBT success. (13/16)

3 Proposal 8: LCID set1 (below 64) is used for LBT failure MAC CE. (11/15)

4 Proposal 10: The UE behavior for type-2 configured grant activation/deactivation agreed for IIoT - including joint de-activation- to is extended for NR-U UEs. (consensus)

Flagged for discussion

Proposal 6: Reply to RAN4 that UL LBT failure detection/recovery is applicable per current specifications to RA in R15-based handover, R15 SN addition/change, and PSCell addition, given the UE is in connected mode. However, an RLF is triggered due to UL LBT failure is ignored by RRC while relevant procedure timers are running, and recovery occurs once timers expire. LBT failure detection/recovery is not applicable per current specifications in RRC setup, resume, re-establishment, or release with redirection, as the UE does not have lbt-FailureRecoveryConfig during those procedures.

Proposal 7: Reply to RAN4 that no enhancements are planned in R-16 for UL LBT failure detection and recovery during handover, RRC setup, resume, re-establishment, or release with redirection. Enhancements can be pursued in future releases or in R-16 if RAN2 finds critical issues for detection/recovery during these procedures.

Proposal 7-bis: Reply to RAN4 that RAN2 is still discussing whether there are any issues with applicability of UL LBT failure detection/recovery during handover, RRC setup, resume, re-establishment, or release with redirection, and will inform RAN4 with the outcome. (to be used if P7 is not agreed).

**Set of proposals with no clear majority – to be discussed online**

Proposal 1: Update the agreement on incrementing the preamble counter to:

The PREAMBLE\_TRANSMISSION\_COUNTER is not increased if the preamble is not transmitted due to LBT failure and lbt-FailureRecoveryConfig is configured.

Proposal 2: Update the agreement on incrementing the SR counter to:

The SR\_COUNTER is not increased if the SR is not transmitted due to LBT failure and lbt-FailureRecoveryConfig is configured.

Proposal 3: The MAC entity may stop an ongoing Random Access procedure initiated by a pending SR triggered by consistent LBT failure on at least one Scell, if:

iii. The SCell(s) that triggered the corresponding SR are deactivated (see clause 5.9); or

iv. a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response, and the PDU includes an LBT failure MAC CE that indicates consistent LBT failure for the Serving Cell that triggered the SR.

Note: it is up to the NR-U TS 38.321 rapporteur how to capture this, considering exact wording and the outcome of [AT109bis-e][060][NR16] RACH stopping.

Proposal 9: RAN2 to agree to one of the following:

- merge harq-ProcID-Offset 1 & 2 and remove the one with the 2 suffix form TS 38.321 and TS 38.331.

- capture in TS 38.331 that harq-ProcID-Offset2 and cg-RetransmissionTimer should not be configured simultaneously for a certain configured grant.

[R2-2003966](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003966.zip) Reply LS to RAN4 on LBT failure recovery (R4-2002282) InterDigital

**Will not be treated**

[R2-2002848](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002848.zip) Remaining critical issues for LBT failures Qualcomm Incorporated discussion

[R2-2002582](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002582.zip) Clarification on the LBT Failure Indication vivo discussion

[R2-2002583](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002583.zip) Discussion on the UE Processing Time for Autonomous Retransmission vivo discussion

[R2-2002613](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002613.zip) Clash between NR-U and IIoT for the configured grant Samsung discussion Rel-16 NR\_unlic-Core

[R2-2002614](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002614.zip) Prioritization between initial TX and re-TX on CG in NR-U Samsung CR Rel-16 38.321 16.0.0 0706 - F NR\_unlic-Core

[R2-2002837](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002837.zip) Discussion incoming RAN1 LS on LBT failure indication OPPO discussion Rel-16 NR\_unlic-Core

[R2-2002931](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002931.zip) Stopping ongoing Random Access procedure LG Electronics Inc. discussion Rel-16 NR\_unlic-Core

[R2-2003004](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003004.zip) Remaining issue on 2-step random access in NR-U Huawei, HiSilicon discussion Rel-16 NR\_unlic-Core

[R2-2003005](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003005.zip) Discussion on the MAC CE for NR-U Huawei, HiSilicon discussion Rel-16 NR\_unlic-Core

[R2-2003006](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003006.zip) Discussion on PDCCH group switching for NR-U Huawei, HiSilicon discussion Rel-16 NR\_unlic-Core

[R2-2003410](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003410.zip) UEs not supporting gap-less msgA transmission Ericsson discussion Rel-16 NR\_unlic-Core, NR\_2step\_RACH-Core

[R2-2003498](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003498.zip) MsgA PUSCH LBT failure impact CMCC discussion Rel-16

Not complying to guidance

[R2-2003031](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003031.zip) Flushing HARQ buffer of the pending HARQ process in NR-U LG Electronics Polska CR Rel-16 38.321 16.0.0 0717 - F NR\_unlic-Core

[R2-2003050](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003050.zip) Draft CR on LBT failure handling in MAC Nokia, Nokia Shanghai Bell draftCR Rel-16 38.321 16.0.0 NR\_unlic-Core

### 6.2.3 Control plane

*Including [Post109e#38][NR-U] RRC open issues (Qualcomm)*

*Contributions related to issues addressed by the email discussions should be avoided and are discouraged for this AI.*

*All identified critical open issues should be provided to the rapporteur via email discussion Post109e#38 and new contributions on those topics are discouraged. Contributions should be reserved for more complicated issued.*

*No individual company CRs should be submitted*

**To be treated**

[R2-2002843](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002843.zip) Report of [Post109e#38][NR-U] RRC open issues Qualcomm Incorporated report Late

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| **Agreements**  1 Introduce the field descriptions communicated by RAN1 with the following changes:   * Use *inOneGroup* instead of *mediumBitmap* in *ServingCellConfigCommonSIB [verify this]* * Include the statement in “The UE expects that a bit at position k > ssb-PositionQCL-Relationship-16 is 0, and the number of actually transmitted SS/PBCH blocks is not larger the number of 1’s in the bitmap.” in SSB-ToMeasure * Use “For operation in licensed spectrum” instead of “without shared spectrum channel access” * Use “leftmost” instead of “MSB”   2: No other changes are introduced to RRC to address the recommendations and agreements in RAN1 LS ([R2-2001357](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2001357.zip)).  3. Introduce the following changes:   * Replace ffsValue with 64 in:   + 1. co-DurationList-r16 SEQUENCE (SIZE(1..ffsValue)) OF CO-Duration-r16 -- FFS size upper limit 64 * Replace ffsValue below with 1120 to support 20ms duration (the new upper limit is changed from 560 to 1120 as it is needed for SCS 60Khz):   + 1. CO-Duration-r16 ::= INTEGER (0..ffsValue) -- FFS upper limit 560   The structure discussion and possible unification is moved to ASN.1 discussion. Capture this as open issue.   * Add field description for *CO-Duration*   4. Introduce the following changes:   1. Replace ffsValue below with 80 (maximum needed for 20ms with SCS of 60khz):    * 1. searchSpaceSwitchingTimer-r16 INTEGER (1..ffsValue) 2. Put in the field description of *searchSpaceSwitchingTimer* that “For 15 kHz SCS, {1..20} are valid. For 30 kHz SCS, {1..40} are valid. For 60kHz SCS, {1..80} are valid. Note that this is in slots as used in 38.213.   5 Introduce the following in the field description of *cp-ExtensionC2, cp-ExtensionC3:*  Configures the cyclic prefix (CP) extension (see TS 38.211 [16], clause 5.3.1). For 15 kHz SCS, {1..28} are valid for both *cp-ExtensionC2* and *cp-ExtensionC3*. For 30 kHz SCS, {1..28} are valid for *cp-ExtensionC2* and {2..28} are valid for *cp-ExtensionC3.* For 60 kHz SCS, {2..28} are valid for *cp-ExtensionC2* and {3..28} are valid for *cp-ExtensionC3*.  6 Introduce the following changes to RRC:   1. Introduce a new IE in RMTC-Config called *ref-SCS-CP* with the values of {15 kHz, 30 kHz, 60 kHz-NCP, 60 kHz-ECP} 2. Remove the Editor’s Note on L3 filtering for RSSI 3. Wait for RAN4 conclusion on actual values for *rssi-Result-r16* and *channelOccupancyThreshold-r16* before introducing the indices corresponding to RAN4 table   7: Introduce the following changes in RRC:   1. Change the value range for *cg-nrofSlots-r16* to {1,2, ..., 40} 2. Change the value range for *cg-minDFIDelay-r16* to ENUMERATED {sym7, sym1x14, sym2x14, sym3x14, sym4x14, sym5x14, sym6x14, sym7x14, sym8x14, sym9x14, sym10x14, sym11x14, sym12x14, sym13x14, sym14x14, sym15x14, sym16x14} and introduce additional text in the field description as:   ***cg-minDFIDelay***  Indicates the minimum duration (in unit of symbols) from the ending symbol of the CG-PUSCH to the starting symbol of the DFI carrying HARQ-ACK for that PUSCH. UE assumes HARQ-ACK is valid only for PUSCH transmissions ending before n - cg-minDFIDelay-r16, where n is the time corresponding to the beginning of the start symbol of the DFI (see TS 38.213 [13], clause 10.3).  The following minimum delay values are supported depending on the configured subcarrier spacing [symbols]:  15 kHz: 7, m\*14, where m={1, 2, 3, 4}  30 kHz: 7, m\*14, where m={1, 2, 3, 4, 5, 6, 7, 8}  60 kHz: 7, m\*14, where m={1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16}   1. Change the value ranges as follows:   *cg-StartingPartialBW-InsideCOT-r16* and *cg-StartingPartialBW-OutsideCOT-r16* to to INTEGER (0..6)  *cg-StartingFullBW-InsideCOT-r16* and *cg-StartingFullBW-OutsideCOT-r16*r to SEQUENCE (SIZE (1..ffsValue)) OF INTEGER (0..6)   1. Change the ffsValue in *betaOffsetCG-UCI-r16* value range to 31   8: For signalling of intra-cell guard bands, an explicit IE is used for “default” case and no guard bands are used if signaling is absent.  9: Add the following ASN.1 to introduce multiple uplink grants:  In PUSCH-Config:  pusch-TimeDomainAllocationList-r16 SetupRelease { PUSCH-TimeDomainResourceAllocationList-r16 }  The new PUSCH-TimeDomainResourceAllocationList-r16:  PUSCH-TimeDomainResourceAllocationList-r16 ::= SEQUENCE (SIZE(1..maxNrofUL-Allocations)) OF PUSCH-TimeDomainResourceAllocation-r16  PUSCH-TimeDomainResourceAllocation-r16 ::=  SEQUENCE {     k2-r16                                              INTEGER (0..32)                                    OPTIONAL,   -- Need S     multiplePUSCH-Allocations-r16             SEQUENCE (SIZE(2..maxNrofMultiplePUSCHs-r16)) OF SinglePUSCH-TimeDomainResourceAllocation-r16  }  SinglePUSCH-TimeDomainResourceAllocation-r16 ::= SEQUENCE {  mappingType ENUMERATED {typeA, typeB},  startSymbolAndLength INTEGER (0..127)  }  10: Add to section 6.5 the UE may stop monitoring the PDCCH occasions for paging when this bit is set as defined in 304.  11: No additional values are introduced for *nrofPDCCHMonitoringOccasionPerSSB-r16* and the Editor’s Note on this can be removed.  12: The following additional values are introduced for *lbt-FailureInstanceMaxCount-r16:* 64 and 128. No additional values are added for *lbt-FailureDectectionTimer-r16* and the Editor’s Note on this can be removed. Check with ASN.1 rapporteur. |

[R2-2002846](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002846.zip) NR-U RRC Open Issues List Qualcomm Incorporated discussion Late

- Ericsson thinks that U523 is incorrect description

- Intel sympathizes with U542. Huawei thinks that the intention and information is the same so it is a matter of signalling structure. Qualcomm thinks that it is a matter of overhead.

**Agreements:**

1. close U521

2. close U522 – the name will remain as is

3. rapporteur will check 523 and correct accordingly

4. U527 can be closed and RAN1 can check and tell us if there is something wrong

5. U540 and U541 can be closed

6. U518 is closed

[R2-2003953](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003953.zip) Outcome of [AT109bis-e][501][NR-U] CP Open and ASN.1 Issues (Qualcomm)

To be AGREEMENTS

1. Proposal 1: (Issue U506 and U557) Extend RSSI/CO measurements to inter-frequency (as in LTE LAA). The IE rmtc-SubframeOffset-r16 is optional for inter-frequency (as in LTE LAA).
2. Proposal 2: (Issue U510) Keep the ASN.1 for useInterlacePUCCH-PUSCH-r16 as ENUMERATED {true} with Need M. No changes to the 38.331 is needed.
3. Proposal 3: (Issue U515) The IE for signaling of Q in measurement object is kept Optional. It is added to the field description that the UE applies default value 8 when not signaled.
4. Proposal 4: (Issue U528) No changes to the field description of ra-ResponseWindow is needed.
5. Proposal 5: (Issue U538) Move the IEs searchSpaceGroupIdList-r16 and freqMonitorLocations-r16 from SearchSpace to SearchSpace-v16xy in order to allow search space switching for Type-3 CSS.
6. Proposal 6: (Issue U544) No changes are made to the field description of ssb-PositionInBurst
7. Proposal 7: (Issue U548) No changes are made to the field description of measRSSI-ReportConfig
8. Proposal 8: (Issue U555) Introduce text for setting failureType as scg-lbtFailure in 5.7.3.5 (corresponding to NR-NRU DC)
9. Proposal 9: (Issue 558) No changes are made to betaOffsetCG-UCI-r16 since it can already be configured dynamically.
10. Proposal 10: (Issue 559) The IE ChannelAccessMode is kept in ServingCellConfigCommon without any changes.
11. Proposal 11: (Issue 561) No changes are made to the structure of IE searchSpaceGroupIdList-r16.
12. Proposal 12: Agree to the editorial changes suggested in:
13. U563: Change “neighbour” to “this serving cell” for field description of ssb-PositionQCL in ServingCellConfigCommon
14. U564: Change semistatic to semiStatic

NEEDS ONLINE DISCUSSION

*Proposal 13: (Issue U549) It should be clarified that the “when a (first) measurement result is available” for RSSI reporting in 5.5.4.1 is only applicable to reportType set to periodical*

*Proposal 14: (Issue U551) Move ssb-PositionQCL-Common from MeasObjectNR to sub-element SSB-ConfigMobility within MeasObjectNR*

*Proposal 15: (Issue U552) Move cell specific Q from MeasObjectNR to sub-element SSB-ConfigMobility within MeasObjectNR. However, do not change the structure, i.e. keep the list.*

*Proposal 16: (Issue 540) Change the text for RSSI reporting as follows: “the UE measures and reports on any the defined measurement bandwidth and configured time domain measurement resources on the indicated frequency.”*

*Proposal 17: (U801) Put frequency specific Q values in the MeasObjectNR for E-UTRAN, include ssb-PositionQCL-CommonNR in the existing IE RS-ConfigSSB-NR-r15*

*Proposal 18: (U802) Per-cell Q value can be broadcasted in LTE SIB24 for NR-U neighbour cells.*

CHANGING PREVIOUS AGREEMENTS

Proposal 19: (Issue 560) The UE applies default guard band when signalling is absent and no guard band is signalled by explicit IE.

NEEDS FURTHER DISCUSSION

*The following issues are related to aligning RAN2 and other group specs or there was no feedback or there was no clear majority so should be kept open for further discussion.*

*Proposal 20: Further discuss the following issues until next RAN2 meeting:*

*U550: L1 measurement period vs duration*

*U554, U556: field description for cg-minDFIDelay*

*U562: Change the minimum size of multi-TTI PUSCH table (allow list with single entry)*

*U567: CAPC determination when DCI 0\_0 is used.*

[R2-2002847](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002847.zip) Miscellaneous corrections for NR-U Qualcomm Incorporated CR Rel-16 38.331 16.0.0 1528 - F NR\_unlic-Core Late

=> The CR is endorsed as a baseline and further agreements will be captured in this based

[R2-2002845](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002845.zip) E-UTRAN and NR-U interworking Qualcomm Incorporated discussion

Agreements

1: Introduce RSSI/CO measurement and reporting of NR-U frequencies in E-UTRAN in order to improve E-UTRAN to NR-U handover (depending on whether inter-freq measurements are agreed)

2: Introduce white-list of neighbour NR-U cells in E-UTRAN (SIB24) – 16 NR-U cells just like in NR.

3: Introduce a new cause value scg-lbtFailureNR in SCGFailureInformationNR in 36.331.

4: FFS based on NR discussion – whether Per-cell Q value can be broadcasted in LTE SIB24 for NR-U neighbour cells.

[R2-2003414](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003414.zip) Mobility to NR operating with shared spectrum access Qualcomm Incorporated CR Rel-16 36.331 16.0.0 4263 - B NR\_unlic-Core

=> The CR is moved to email discussion for approval and the agreements based on [R2-2002845](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002845.zip) should be captured

**Will not be treated**

[R2-2002615](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002615.zip) Applicability of NR-U features to licensed carrier Samsung discussion Rel-16 NR\_unlic-Core [R2-2000535](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2000535.zip)

[R2-2002719](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002719.zip) On Q-values for Measurements in NR-U Mediatek Inc. discussion

[R2-2002910](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002910.zip) Description on Short Message in TS38.331 LG Electronics Inc. discussion Rel-16

[R2-2002966](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002966.zip) Addressing RAN1 and RAN4 questions on LBT failure configuration ZTE Corporation, Sanechips discussion

[R2-2002967](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002967.zip) Draft-Reply LS on consistent UL LBT failure detection mechanism ZTE Corporation, Sanechips response Late

[R2-2002968](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002968.zip) Draft-Reply LS on LS on UL LBT failure recovery for the target cell ZTE Corporation, Sanechips response

[R2-2003041](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003041.zip) Remaining control plane issues Ericsson discussion NR\_unlic-Core [R2-2000337](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2000337.zip)

[R2-2003407](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003407.zip) LS reply to RAN4 on UL LBT failure recovery for the target cell Ericsson LS out Rel-16 NR\_unlic-Core To:RAN4 Cc:None Late

[R2-2003408](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003408.zip) UL LBT failure recovery for target cell Ericsson discussion Rel-16 NR\_unlic-Core

## 6.11 UE Power Saving in NR

(NR\_UE\_pow\_sav-Core; leading WG: RAN1; REL-16; started: Mar 19; target; Jun 20; WID: [RP-200494](file:///C:\Data\3GPP\TSGR\TSGR_84\docs\RP-191607.zip); SR: RP-200237, See also guidence in RP-192326). Documents in this agenda item will be handled in a break out session. NOTE: "SCell dormancy" like behaviour will be discussed in MR-DC WI.

Time budget: 1 TU

Tdoc Limitation: 2

### 6.11.1 Organisational

Including incoming LSs, running TS, rapporteur inputs, etc

NOTE: any stage 3 identified issues with MIMO configurations should be provided to 38.331 rapporteur (Mediatek)

Contributions in this AI are reserved for WI rapporteur inputs and/or spec rapporteur inputs and do not count towards the tdoc limits. Including outcome of email [Post109e#42][PowSav] UE capabilities (Intel)

No contributions expected for UE capabilities. Please provide your input to the email discussion. Intel is expected to produce first draft of 38.304

**To be treated at the end of session**

[R2-2002601](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002601.zip) Report of email discussion [Post109e#42][PowSav] UE capabilities Intel Corporation discussion Rel-16 NR\_UE\_pow\_sav

*Proposal 10. [8 or 7 out of 10] For maxMIMO-LayerPreference, and maxBW-Preference, its characteristics are defined as “FR1-FR2 DIFF: No” (to the characteristic associated to FR1/FR2 equally applicable for FR1/FR2).*

- Intel thinks that there is no strong motivation to differentiate between FR1 and FR2. Qualcomm explains that FR1 and FR2 operate in different HW so it is good to have separate capabilities. Vivo, Apple agrees with Qualcomm and thinks that the UE can report different preferences.

- Ericsson thinks that there may be some use for the network as well.

**Agreements**

1 A new UE capability (referred e.g. as drx-Preference) is defined to indicate its preference on DRX parameters for power saving in RRC\_CONNECTED. [9 out of 10] It is included in section 4.2.2 “General parameters” of TS 38.306.

2. A new UE capability (referred e.g. as maxBW-Preference) is defined to indicate its preference on the maximum aggregated bandwidth for power saving in RRC\_CONNECTED. [8 out of 10] It is included in section 4.2.2 “General parameters” of TS 38.306.

*3* A new UE capability (referred e.g. as maxCC-Preference) is defined to indicate its preference on the maximum number of secondary component carriers for power saving in RRC\_CONNECTED. It is included in section 4.2.2 “General parameters” of TS 38.306.

4. A new UE capability (referred e.g. as maxMIMO-LayerPreference) is defined to indicate its preference on the maximum number of MIMO layers for power saving in RRC\_CONNECTED. [8 out of 10] It is included in section 4.2.2 “General parameters” of TS 38.306.

5 It is not agreed to bundle into a separate new UE capability the support for UE’s assistance of the maxCC, maxBW and maxMIMO.

6. A new UE capability (referred e.g. as release-Preference) is defined to indicate its preference assistance information to transition out of RRC\_CONNECTED for power saving. It is included in section 4.2.2 “General parameters” of TS 38.306.

7 New UE capability is defined for the relaxed measurement feature without signalling to the gNB, i.e. gNB will not know whether a UE supports or not this feature. It is included in section 5 “Optional features without UE radio access capability parameters” of TS 38.306.

8 For drx-Preference, maxCC-Preference, release-Preference, maxMIMO-LayerPreference, and maxBW-Preference, its characteristics are defined as as “Per: UE” (to the characteristic associated to the UE), “M: No” (to the characteristic associated with mandatory/optional features), “FDD-TDD DIFF: No” (to the characteristic associated with the applicability for FDD/TDD).

9 For drx-Preference, maxCC-Preference, and release-Preference, its characteristics are defined as “FR1-FR2 DIFF: No” (to the characteristic associated to FR1/FR2 equally applicable for FR1/FR2).

10 For maxMIMO-LayerPreference, and maxBW-Preference, its characteristics are defined as “FR1-FR2 DIFF: Yes” (to the characteristic associated to FR1/FR2 are not equally applicable for FR1/FR2).

11 Rel-16 capability maxMIMO-LayerPreference is not linked to Rel-15 capability maxLayersMIMO-Indication

[R2-2002602](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002602.zip) UE capabilities for Rel-16 Power Saving (PWS) WI Intel Corporation draftCR Rel-16 38.306 16.0.0 B NR\_UE\_pow\_sav

[R2-2002842](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002842.zip) SRB3 for reporting UAI for power saving OPPO CR Rel-16 37.340 16.1.0 0189 - F NR\_UE\_pow\_sav-Core

### 6.11.2 PDCCH-based power saving signals/channel Additional stage-3 RAN2 aspects

Including out of [Post109e#41][PowSav] DCP open issues (InterDigital, Huawei)

Contributions related to issues addressed by the email discussions should be avoided and are discouraged for this AI.

All identified critical open issues should be provided to the rapporteur via email discussion Post109e#41 and new contributions on those topics are discouraged. Contributions should be reserved for more complicated and critical issues.

No individual company CRs should be submitted

**To be treated**

[R2-2003378](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003378.zip) Summary of [Post109e#41] [PowSav] DCP open issues – Phase 1 InterDigital discussion Rel-16 NR\_UE\_pow\_sav-Core Late

=> Noted

[R2-2003379](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003379.zip) Report of [Post109e#41] [PowSav] DCP open issues InterDigital discussion Rel-16 NR\_UE\_pow\_sav-Core Late

=> Noted

**Agreements**

1 RAN2 confirms that the flags ps-TransmitPeriodicL1-RSRP and ps-TransmitPeriodicCSI are defined per cell group

2 The flags ps-TransmitPeriodicCSI and ps-TransmitPeriodicL1-RSRP are independent, and it is possible to control UE to report all types of periodic CSI apart from L1-RSRP (i.e. cri-RSRP and ssb-Index-RSRP)

3 The flag ps-TransmitPeriodicCSI is renamed to ps-TransmitOtherPeriodicCSI

*Proposal 1: DCP is supported for Short DRX in Rel-16 and is configurable by the network. (7/13)*

*­*­- Intel thinks that there is no clear majority and there is some concerns from RAN1. Vivo also thinks that RAN2 can’t make this decision. Nokia thinks that we have already agreed in RAN2 and hasn’t come up with any technical concern. Samsung, LG and Apple agree with Intel.

- Ericsson thinks that this is a RAN2 topic and agrees with Nokia

*Proposal 5: The flag ps-TransmitPeriodicCSI is renamed to ps-TransmitOtherPeriodicCSI. (5/10)*

- Mediatek asks if we should tell RAN1.

=> Include this agreement in a RAN1 LS

[R2-2003963](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003963.zip) LS to RAN1 on agreements InterDigital

[R2-2003955](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003955.zip) Outcome of [AT109bis-e][506][PowSav] Open Issues for DCP (InterDigital)

**To be confirmed**

**Agreements by email**

1 RAN2 to send an LS to RAN1 to clarify UE behaviour when DCP overlaps with RAR with C-RNTI. (10/13)

2 When configured with multiple DCP monitoring occasions, UE behaviour when some DCP monitoring occasions overlap with active time or measurement gap or BWP switching, but at least one DCP monitoring occasion does not, will be further addressed by RAN1, if necessary. (consensus)

[R2-2003129](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003129.zip) Miscellaneous corrections to 38.321 for Rel-16 UE power saving Huawei, HiSilicon CR Rel-16 38.321 16.0.0 0719 - F NR\_UE\_pow\_sav-Core Late

=> The CR will be revised in [R2-2003956](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003956.zip) capturing agreements from week1 meeting and from offline email discussion

[R2-2003956](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003956.zip) Miscellaneous corrections to 38.321 for Rel-16 UE power saving Huawei, HiSilicon CR Rel-16 38.321 16.0.0 0719 - F NR\_UE\_pow\_sav-Core Late

**Will not be treated**

[R2-2002797](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002797.zip) PDCCH-WUS Mechanism Apple discussion NR\_UE\_pow\_sav-Core

[R2-2002839](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002839.zip) Remaining issues of DCP impact on SCell dormancy OPPO discussion Rel-16 NR\_UE\_pow\_sav-Core

[R2-2002866](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002866.zip) Remaining issues for DCP vivo discussion Rel-16 FS\_NR\_UE\_pow\_sav

[R2-2002930](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002930.zip) Correction on RAR and DCP monitoring Nokia, Nokia Shanghai Bell draftCR Rel-16 38.321 16.0.0 F NR\_UE\_pow\_sav-Core

[R2-2003032](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003032.zip) Remaining issue on DCP monitoring within RAR window LG Electronics Inc. discussion NR\_UE\_pow\_sav-Core

[R2-2003288](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003288.zip) Open issues UE capability, DCP, UE assistance and RRM relaxation Ericsson discussion Rel-16 NR\_newRAT-Core

[R2-2003562](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003562.zip) PDCCH-based power saving signal/channel Samsung discussion NR\_UE\_pow\_sav-Core

### 6.11.3 UE assistance and RRC

Including outcome of [Post109e#43][PowSav] UE Assistance and RRC open issues (Mediatek)

Contributions related to issues addressed by the email discussions should be avoided and are discouraged for this AI.

All identified critical open issues should be provided to the rapporteur via email discussion Post109e#43 and new contributions on those topics are discouraged. Contributions should be reserved for more complicated.

No individual company CRs should be submitted

**To be treated**

[R2-2003127](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003127.zip) Summary of [Post109e#43][PowSav] UE Assistance and RRC open issues MediaTek Inc. discussion Rel-16 NR\_UE\_pow\_sav-Core Late

*Discussion*

- Mediatek explains that we have different triggers for power saving. Samsung maybe thinks that we can have some grouping and the current ASN.1 is not so pretty. Mediatek thinks that maybe we can group BW, CC and MIMO.

**Agreements**

1 Delta signalling applies at a ‘feature’ level, where the ‘features’ for power saving are: drx-Preference, maxBW-Preference, maxCC-Preference, maxMIMO-LayerPreference, minSchedulingOffsetPreference and releasePreference. No further grouping is considered.

2 When reporting a ‘feature’, the all parameters that the UE has a preference for are included. Parameters that are not included are interpreted as the UE having no preference for those parameters.

3 An empty ‘feature’ IE can be signalled to indicate that the UE has no preference for all parameters in the ‘feature’ (i.e. similar to overheating)

4 In NR-DC, SCG specific UAI for power saving can be configured by the network

5 The reported UAI for power saving is specific to a cell group

6 In (NG)EN-DC, SCG specific UAI for power saving can be configured by the network via SRB1 (using nr-SecondaryCellGroupConfig) or SRB3 (using RRCReconfiguration).

7 In (NG)EN-DC, SCG specific UAI for power saving is transmitted in ULInformationTransferMRDC on the LTE leg.

8 In (NG)EN-DC, SCG specific UAI for power saving is transmitted on the NR leg via SRB3, if SRB3 is configured.

9 In NR-DC, SCG specific UAI for power saving can be configured by the network via SRB1 (using mrdc-SecondaryCellGroup) or SRB3 (using RRCReconfiguration).

10 In NR-DC, SCG specific UAI for power saving is transmitted in ULInformationTransferMRDC on SRB1.

11 In NR-DC, SCG specific UAI for power saving is transmitted on the SCG via SRB3, if SRB3 is configured.

*12* A Note is included in the RRC specification clarifying how the UE can indicate a preference for NR SCG release. (

13 The field description of maxMIMO-Layers is updated to indicate that the field does not override the value provided in PDSCH-ServingCellConfig.

14 Preferred RRC state is always reported in the release preference, and can indicate idle, inactive, connected and out of connected

15 Inform RAN3 of our agreement on the indication of SCG release preference from the UE.

[R2-2003964](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003964.zip) *LS to RAN3 on RAN2 agreements Mediatek*

***Discussions***

*Proposal 1: UE can indicate any preferred value within its capability for maximum aggregated bandwidth, number of carriers, MIMO layers and minimum scheduling offset.*

- Apple suggests that we can limit the amount of times that the UE requests. Mediatek explains that in the email discussion there was very limited supported.

- Qualcomm wonders if we can make this network configurable. ZTE, Nokia, and Ericsson don’t think we should make everything configurable. Apple agrees with the compromise. Ericsson thinks that the UE can just send a no preference indication and the network can configure the UE accordingly.

- Vivo asks how the network would configure it, it would need to report UE capability.

- Huawei supports and is ok to have the configurability.

*Proposal 2: UE can indicate a preferred maximum aggregated bandwidth for a frequency range not configured with serving cells.*

[R2-2003125](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003125.zip) CR for 38.331 for Power Savings MediaTek Inc. CR Rel-16 38.331 16.0.0 1540 - C NR\_UE\_pow\_sav-Core Late

[R2-2003126](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003126.zip) CR for 36.331 for Power Savings MediaTek Inc. CR Rel-16 36.331 16.0.0 4245 - B NR\_UE\_pow\_sav-Core Late

[R2-2003957](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003957.zip) Outcome of [AT109bis-e][504][PowSav] CP/UE assistance Open and ASN.1 Issues (Mediatek)

**Will not be treated**

[R2-2002670](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002670.zip) Power Saving UE assistance information Sony discussion Rel-16 NR\_UE\_pow\_sav-Core

[R2-2002798](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002798.zip) Value Range for UE Assistance Information Apple discussion NR\_UE\_pow\_sav-Core

[R2-2002838](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002838.zip) Remaining issues on implicit SCG release OPPO discussion Rel-16 NR\_UE\_pow\_sav-Core

[R2-2003229](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003229.zip) Adopting general UE assistance reporting framework to UE power saving Samsung Telecommunications discussion Rel-16

[R2-2003289](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003289.zip) UE assistance for connection release Ericsson, ZTE, Deutsche Telekom discussion Rel-16 NR\_newRAT-Core

[R2-2003387](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003387.zip) Adopting general UE assistance reporting framework to UE power saving Samsung Telecommunications discussion Rel-16 Late

[R2-2003472](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003472.zip) Discussion on clarification for max MIMO layer and antenna port Huawei, HiSilicon discussion Rel-16 NR\_UE\_pow\_sav-Core

[R2-2003473](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003473.zip) TP for clarification for max MIMO layer and antenna port Huawei, HiSilicon discussion Rel-16 NR\_UE\_pow\_sav-Core

### 6.11.6 RRM measurement relaxation

Including out of [Post109e#44][PowSav] RRM open issues (CATT, Vivo)

Contributions related to issues addressed by the email discussions should be avoided and are discouraged for this AI.

All identified critical open issues should be provided to the rapporteur via email discussion Post109e#44 and new contributions on those topics are discouraged. Contributions should be reserved for more complicated issued.

No individual company CRs should be submitted

**To be treated**

[R2-2002791](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002791.zip) Report of [Post109e#44][PowSav] RRM open issues CATT discussion Rel-16 NR\_UE\_pow\_sav-Core

*Proposal 1 If timer T330 is running, relaxed RRM measurement can be performed. No further specification impact (10/13).*

- Ericsson thinks that there is a problem with this as it will influence the logged MDT measurements. We should make sure that two features can co-exist. The work around of disabling RRM if the network wants RRM is not a good solution.

- CMCC agrees with Ericsson and this is an important feature for operators and we would collect misleading results. Samsung supports Ericsson’s view

- CATT asks why this hasn’t been a problem with the existing Rel-15 relaxation.

- Vivo and LG support the proposal and MDT is a feature for a number of UEs and RAN4 already agreed that the relaxation approach doesn’t stop the measurement but relaxes some measurements sample or extends the measurement period. For such relaxation there is no impact to MDT. LG also explains that the UE still is taking measurements and if it is not taking measurement then the UE is in low mobility.

- ZTE supports Ericsson’s view and in some scenarios it will skew the measurement results.

- Mediatek understands the concerns from ZTE and Ericsson, but the network can fix the problem by not configuring both RRM and MDT. However, if the network and operators have concerns Mediatek is fine.

- Huawei explains that one of the principles of MDT has always been that the UE should perform measurements without impacting the UE.

- Sony thinks that this under control

- Intel suggests a compromise that this is under control

- Ericsson is ok with this compromise but they would also like a bit in MDT measurements to indicate that there was relaxed RRM

- Nokia thinks that the network knows about the UE supported RRM or not.

*Proposal 2 (13/13):* *When cellEdgeEvalutation is configured, SSearchThresholdP should be mandatory while SSearchThresholdQ is optional.*

*Proposal 3 (8/10): It is left up to UE implementation whether to re-evaluate the relaxation criterion when network changes the relaxed measurement parameters in system information. The System Information change procedure is not impacted. No specification change to capture any UE behavior.*

- Nokia is worried that the UE don’t respect the system information update. CATT explains that the intention is not to ignore the system information update, but rather the behaviour upon the SI change.

*The following issue could not be resolved and should be continued on-line during next e-meeting:*

*The configuration of the relaxation criteria is constant for all frequencies (6) or is per-frequency (or per-FR) configured (7).*

- Vivo would like to consider grouping of frequencies

- Sony asks if RAN4 is discussing this.

**Agreements**

1 It is up to network control whether relaxed RRM measurements can be performed if T330 is running. FFS whether we need additional RRC signalling.

*2* When cellEdgeEvalutation is configured, SSearchThresholdP should be mandatory while SSearchThresholdQ is optional

3 No new behaviour for RRM relaxation needs to be captured if the parameters in SI change and UE continues legacy behaviour of SI change/update. The UE applies new configuration as in legacy behaviour.

4 FFS Continue offline discussion for FR1/FR2 differentiation only. Down select per-frequency configuration of the relaxation criteria.

5 Scaling factor(s) for relaxed RRM measurements are left to RAN4 to decide

6 How/if higher priority frequencies RRM measurements are relaxed is left to RAN4 to decide

7 Whether RRM measurements relaxation is allowed on a frequency when the UE is configured to perform early measurement on that frequency and T331 is running is left to RAN4 to decide.

[R2-2003954](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003954.zip) Outcome of [AT109bis-e][505][PowSav] RRM Open Issues CATT discussion Rel-16 NR\_UE\_pow\_sav-Core

=> Noted

[R2-2003958](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003958.zip) Outcome of [AT109bis-e][505][PowSav] RRM Open Issues (CATT, Vivo)

*Based on the above discussions, the following proposals should be agreeable:*

Proposal 5 (13/15): Global configuration of relaxation triggers is kept. No change is needed to the current specifications from this aspect.

Proposal 6 (11/13): If timer T330 is running, relaxed RRM measurement can be performed. No further specification impact.

[R2-2002865](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002865.zip) CR on 38.304 for UE Power saving in NR vivo CR Rel-16 38.304 16.0.0 0152 - B FS\_NR\_UE\_pow\_sav

=> The CR is revised in [R2-2003959](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003959.zip) capturing additional agreements from the meeting and email discussion

[R2-2003959](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003959.zip) CR on 38.304 for UE Power saving in NR vivo CR Rel-16 38.304 16.0.0 0152 - B FS\_NR\_UE\_pow\_sav

**Will not be treated**

[R2-2002665](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002665.zip) UE power saving for inter frequency measurements Sony discussion Rel-16 NR\_UE\_pow\_sav-Core [R2-2000827](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2000827.zip)

[R2-2002735](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002735.zip) Configurations for RRM Measurement Relaxation MediaTek Inc. discussion

[R2-2002867](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002867.zip) Configurations for RRM Measurement Relaxation vivo discussion Rel-16 FS\_NR\_UE\_pow\_sav

[R2-2002950](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002950.zip) Correction of SI update of relaxed measurement parameters Nokia, Nokia Shanghai Bell, Ericsson draftCR Rel-16 38.304 16.0.0 F NR\_UE\_pow\_sav-Core

[R2-2003216](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003216.zip) EMR issue on relaxed measurement LG Electronics Inc. discussion Rel-16 NR\_UE\_pow\_sav-Core Withdrawn

[R2-2003219](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003219.zip) EMR issue on relaxed measurement LG Electronics Inc. discussion Rel-16 NR\_UE\_pow\_sav-Core

## 6.13 2-step RACH for NR

(NR\_2step\_RACH-Core; leading WG: RAN1; REL-16; started: Dec 18; target; Mar 20; WID: [RP-](file:///C:\Data\3GPP\Extracts\RP-190711%20Revised%20work%20item%20proposal%202%20step%20RACH%20for%20NR.docx)200085; SR: RP-200488). Documents in this agenda item will be handled in a break out session

Time budget: 1 TU

Tdoc Limitation: 1

### 6.13.1 General

Running CRs, Incoming LSs, Contributions in this AI are restricted for WI rapporteur inputs and/or spec rapporteur inputs and do not count towards the tdoc limits.

All comments related to 38.300 should be given directly to Eswar rapporteur. ZTE will update CRs according to received comments offline

[R2-2003009](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003009.zip) 4-step RA type description Nokia (rapporteur), Nokia Shanghai Bell, ZTE CR Rel-16 38.300 16.1.0 0214 - F NR\_2step\_RACH-Core Late

- Huawei asks if this is Rel-15 CR as well. ZTE explains that the explanation is only needed because we added the 2-step RACH

=> The CR is in principle agreed

**Incoming LS**

[R2-2004164](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2004164.zip) Reply LS on the starting point of MsgB window (R1-2002794; contact: ZTE)

[R2-2004165](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2004165.zip) Reply LS on the support of 2-step CFRA (R1-2002795; contact: ZTE)

[R2-2004167](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2004167.zip) LS Response on preamble-to-PRU mapping for 2-step CFRA (R1-2002901; contact: Ericsson)

### 6.13.2 User plan aspects

A single CR will be produced by Rapporteur. No individual company CRs are expected. Comments should be given directly to rapporteur preferable. Contribution should be reserved for more complicated issued, but they should be critical issues

**To be treated**

[R2-2003960](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003960.zip) Outcome of [AT109bis-e][503][2s RA] UP Open Issues (ZTE)

**Agreements**

1 Once the UE transmits PRACH preamble then it shall transmit the associated PUSCH regardless of the occurrence of measurement gap

2 No changes are made to the MAC spec for the issue related to the MSGA PUSCH resources overlapping with measurement gap

3 Nothing is specified (assumption being the network only uses the optional PUSCH configuration features on dedicated BWPs and only for UEs that support these features) – no change to specification needed. Inform RAN1 about this conclusion

4 If there is no valid PUSCH resource associated to the PRACH resource selected:

o then MAC doesn’t determine the UL grant or the associated HARQ information

o MAC will only indicate the preamble resource to L1

o The UE will still generate the MAC PDU based on the TB size

5 msgA-TransMax is configured for 2 step CFRA in rachConfigDedicated and that the UE is not allowed to switch to 4-step RACH if this is not configured in rachConfigDedicated

6 From RAN2 perspective, if the UE supports 2-step RA, it shall support 2-step CFRA for the SSB case (i.e. same as 4-step RACH)

*7 FFS If RAN1 indicates support for CSI-RS for 2-step CFRA, there is no need for a separate capability bit for this in 38.306 from RAN2 perspective.*

8 Change the LCID to one byte eLCID for the Absolute Timing Advance Command

9 Move the initialisation of RSRP\_THRESHOLD\_RA\_TYPE\_SELECTION after the BWP operation since the threshold can be different in different BWPs

10 The current running CR (updated per the above agreements) can be used as baseline for further review until 27th

- Swapping of order of succssRAR and fallbackRAR in section 5.1.4a: Further comments can be provided for this issue (including the necessary clarification on the need etc) during the CR review phase

- BFR for SpCell: Changes can be kept, text can be reviewed further

- Ambiguity in PRACH prioritisation for 4-step RA: HO part to be fixed and the changes will be kept but to be reviewed further

- Addition of LBT parameters for MSGB: Changes can be kept and CR can be reviewed further

- Other misc corrections: Fix the typo in section 5.1.1 and review other changes in the next round

[R2-2002965](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002965.zip) Updates to MAC spec for 2-step RACH ZTE (CR editor), Nokia, Samsung, Vivo CR Rel-16 38.321 16.0.0 0714 - F NR\_2step\_RACH-Core, NR\_unlic-Core

=> The CR is revised with agreements above in [R2-2003962](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003962.zip) and will be reviewed over email

[R2-2003962](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003962.zip) Updates to MAC spec for 2-step RACH ZTE (CR editor), Nokia, Samsung, Vivo CR Rel-16 38.321 16.0.0 0714 1 F NR\_2step\_RACH-Core, NR\_unlic-Core

[R2-2003961](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003961.zip) LS to RAN1 on agreements ZTE

**Will not be treated**

[R2-2002585](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002585.zip) Remaining Issues on Resource Selection in 2-setp RACH vivo discussion

[R2-2002668](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002668.zip) msgB-RNTI ambiguity for CFRA and CBRA of 2-Step RACH Sony discussion Rel-16 NR\_2step\_RACH-Core [R2-2000833](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2000833.zip)

[R2-2002840](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002840.zip) Remaining issues of 2-step RACH OPPO discussion Rel-16 NR\_2step\_RACH-Core Late

[R2-2003007](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003007.zip) Discussion on remaining issues of 2-step RA Huawei, HiSilicon discussion Rel-16 NR\_2step\_RACH-Core

[R2-2003356](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003356.zip) Handling invalid POs for MsgA transmissions Ericsson discussion Rel-16 NR\_2step\_RACH-Core

[R2-2003357](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003357.zip) Change LCID to eLCID for Absolute Timing Advance Command Ericsson CR Rel-16 38.321 16.0.0 0722 - F NR\_2step\_RACH-Core

[R2-2003362](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003362.zip) Correction of Handling of invalid POs for MsgA transmissions Ericsson CR Rel-16 38.321 16.0.0 0725 - F NR\_2step\_RACH-Core

[R2-2003666](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003666.zip) Further clarifications on parameters for Random Access procedure LG Electronics discussion NR\_2step\_RACH-Core

### 6.13.3 RRC stage-3 related aspects

A single CR will be produced by Rapporteur. No individual company CRs are expected. Comments should be given directly to rapporteur preferable. Contribution should be reserved for more complicated issued, but they should be critical issues

**To be treated**

[R2-2004101](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2004101.zip) RRC ASN.1 open issues Ericsson

The following Rapporteur proposals are suggested to be agreed unchanged:

**Agreements**

1 Proposal 1: Configure msgA-PUSCH-ResourceGroupA and msgA-PUSCH-ResourceGroupB (the latter being conditional on group B being present). Proposal 3: msgA-PUSCH-ResourceGroupA and msgA-PUSCH-ResourceGroupB is separately configured, the parameter msgA-PUSCH-PreambleGroup is not needed

2 Proposal 4: Time domain resource allocation can also be provided through PUSCH-Config if provided (CFRA); 2) Clarification for the absence of PUSCH-TimeDomainAllocation.

3 Proposal 14: For messagePowerOffsetGroupB and ra-MsgA-SizeGroupA absence description does not apply since this is a need M field and is removed.

4 Proposal 15: Need code for cfra-TwoStep-r16 should be same with that for 4-step CFRA, Need S. Add IE field description similar to 4 Step RA to include “If this field is absent, the UE performs contention based random access.”

5 Proposal 16: Agree correction of IE for 2 step CFRA PUSCH resource configuration, MsgA-PUSCH-Resource-r16

6 Proposal 18: Delete sentence on ignoring parameters in field description for rach-ConfigGenericTwoStepRA as there is optionality in signalling whereas this was mandatory in legacy. Add a guidance to not configure those parameters for CFRA, expect for msgatransmax

7 Proposal 19: Agree preambleTransMax-r16 to be optional with condition 2StepOnly

8 Proposal 20: Agree correction so that msgA-TransMax-r16 is applicable if switching to 4 step RA is supported. msgA-TransMax-r16 should be configured in dedicated RACH config.

9 [CB] Proposal 2: msgA-TransmformPrecoder and msgA-DeltaPreamble-r16 are changed to Optional Need R, and sentence “If the field is absent, the UE shall use the parameter msg3-DeltaPreamble of 4-step type RA in the configured BWP if 4-step type RA is configured.” Is removed.

10 Proposal 12: Agree change for msgA-SubcarrierSpacing. For msgA-PRACH-RootSequenceIndex and msgA-RestrictedSetConfig, agree change with the added conditional sentence changed from “This field is only configured for the case of separate ROs between 2-step and 4-step type random access.” to “When both 2-step and 4-step type random access is configured, this field is only configured for the case of separate ROs between 2-step and 4-step type random access.”. Double check for 2-step only case

11 Proposal 13: Agree the clarification in ra-ContentionResolutionTimer field description with the removal of “and the UE shall use the corresponding value from the RACH-ConfigCommon”

12 Proposal 17: Agree to remove parameter totalNumberOfRA-Preambles since preambles for msg1 based SI request does not apply for 2-Step RA type.

[R2-2002556](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002556.zip) Issues - 2 step RA Samsung Electronics Co., Ltd discussion Rel-16 NR\_2step\_RACH-Core

[R2-2002878](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2002878.zip) RAN2 related UE capability for 2-step RACH Intel Corporation discussion Rel-16 NR\_2step\_RACH-Core

[R2-2003255](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003255.zip) Remaining issue on 2-step CFRA Qualcomm Incorporated discussion Rel-16 NR\_2step\_RACH-Core

[R2-2003649](file:///C:\Users\panidx\Documents\RAN2_109bis\Docs\R2-2003649.zip) Correction on 2-step RACH configurations in RRC ASUSTeK discussion Rel-16 38.331 NR\_2step\_RACH-Core