**3GPP TSG-RAN WG2 Meeting #117 electronic draftR2-2203517**

**Online, 21st February – 3rd March, 2022**

Agenda Item: 10.7

Source: Session Chair (Interdigital)

Title: [draft] Report NB-IoT breakout session

Document for: Approval

## General

Please see the following TDocs for e-meeting guidance:

[R2-2202101](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202101.zip) Agenda for RAN2#117-e Chairman agenda

Time Schedule
Please refer to the latest schedule in the RAN2 inbox on the public 3GPP servers.

## List and Status of Offline Email Discussions

The deadlines refer to the deadline for providing company comments unless stated otherwise.

* [AT117-e][300][NBIOT/eMTC] Organisational Brian’s Session (Session Chair)

**Status**: Started

 **Scope:** Comments to session notes. Kick-off and management of email discussions for NB-IoT session. Coordination issues. Other organisational issues and announcements.

 **Intended outcome:** Approval of Report from NB-IoT session.

 **Deadline:** EOM

* [AT117-e][301][NBIOT/eMTC R17] Carrier Selection (ZTE)

**Status**: Started

 **Scope:** Progress and converge on remaining open issues.

 **Intended outcome:** Report in R2-2203575,

 **Deadline:** Friday 25th February 1200 UTC

* [AT117-e][304][NBIOT R15] DRX active time after Scheduling Request or SPS BSR (Huawei)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203571, and revised CRs (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

* [AT117-e][305][NBIOT R15] 2 HARQ processes and HARQ RTT timer (Ericsson)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203572, and revised CRs (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

* [AT117-e][306][NBIOT R16] Random access on multicarrier (CMCC)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203573, and revised CRs (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

* [AT117-e][307][NBIOT/eMTC R17] Reply LS to RAN3 on coverage based carrier selection (Nokia)

**Status**: Started

 **Scope:** draft the reply LS to indicate agreements

 **Intended Outcome:** Approved LS in R2-2203576

 **Deadline:** Friday 25th February 1200 UTC

* [AT117-e][308][NBIOT/eMTC R17] 36.331 CR (Qualcomm)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203577

 **Deadline:** EOM (likely continued post meeting)

* [AT117-e][309][NBIOT/eMTC R17] 36.306 CR (ZTE)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203578

 **Deadline:** EOM (likely continued post meeting)

* [AT117-e][310][NBIOT/eMTC R17] 36.300 CR (Huawei)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203579

 **Deadline:** EOM (likely continued post meeting)

* [AT117-e][311][NBIOT/eMTC R17] 36.302 CR (Huawei)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203580

 **Deadline:** EOM (likely continued post meeting)

* [AT117-e][312][NBIOT R16] PUR Response Window (Qualcomm)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203574, and revised CR (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

* [AT117-e][313][NBIOT/eMTC R17] 36.304 CR (Nokia)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203581

 **Deadline:** EOM (likely continued post meeting)

## 4.1 NB-IoT corrections Rel-15 and earlier

Documents in this agenda item will be handled in a break out session. Common NB-IoT/eMTC parts treated jointly with 4.2.

[R2-2203214](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203214.zip) Correction to DRX active time after a Scheduling Request or a SPS BSR has been sent in NB-IoT Huawei, HiSilicon CR Rel-15 36.321 15.11.0 1528 - F NB\_IOTenh2-Core

[R2-2203215](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203215.zip) Correction to DRX active time after a Scheduling Request or a SPS BSR has been sent in NB-IoT Huawei, HiSilicon CR Rel-16 36.321 16.6.0 1529 - A NB\_IOTenh2-Core

* [AT117-e][304][NBIOT R15] DRX active time after Scheduling Request or SPS BSR (Huawei)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203571, and revised CRs (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

R2-2203571 Report of [AT117-e][304][NBIOT R15] DRX active time after Scheduling Request or SPS BSR (Huawei)) Huawei

[R2-2203480](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203480.zip) Discussion on enabling 2 HARQ processes and HARQ RTT timer in NB-IoT Ericsson discussion NB\_IOTenh-Core

[R2-2203486](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203486.zip) Clarification on CDRX and two HARQ interaction for NB-IoT Ericsson CR Rel-14 36.321 14.13.0 1530 - F NB\_IOTenh-Core

[R2-2203495](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203495.zip) Clarification on CDRX and two HARQ interaction for NB-IoT Ericsson CR Rel-15 36.321 15.11.0 1531 - A NB\_IOTenh-Core

[R2-2203496](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203496.zip) Clarification on CDRX and two HARQ interaction for NB-IoT Ericsson CR Rel-16 36.321 16.6.0 1532 - A NB\_IOTenh-Core

* [AT117-e][305][NBIOT R15] 2 HARQ processes and HARQ RTT timer (Ericsson)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203572, and revised CRs (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

R2-2203572 Report for [AT117-e][305][NBIOT R15] 2 HARQ processes and HARQ RTT timer Ericsson

## 7.3 Additional enhancements for NB-IoT

(NB\_IOTenh3-Core; leading WG: RAN1; REL-16; started: Jun 18; Completed: June 20; WID: RP-200293)

Documents in this agenda item will be handled in a break out session

Some documents in 7.2 and 7.3 may be treated jointly.

[R2-2202633](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202633.zip) Discussion on the issue for random access on multicarrier for NB-IoT CMCC discussion Rel-16 NB\_IOTenh3-Core

[R2-2202634](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202634.zip) Solution for random access issue on multiCarrier in NB-IoT CMCC draftCR Rel-16 36.331 16.7.0 F NB\_IOTenh3-Core

[R2-2202635](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202635.zip) Solution for random access issue on multiCarrier in NB-IoT CMCC draftCR Rel-16 36.321 16.6.0 F NB\_IOTenh3-Core

* [AT117-e][306][NBIOT R16] Random access on multicarrier (CMCC)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203573, and revised CRs (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

R2-2203573 Offline discussion on the issue for Random Access on multicarrier for NB-IoT CMCC

[R2-2203724](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203724.zip) Correction to pur-ResponseWindowTimer and removal of pur-ResponseWindowSize Qualcomm Incorporated, Huawei, HiSilicon CR Rel-16 36.321 16.6.0 1534 - F NB\_IOTenh3-Core, LTE\_eMTC5-Core Late

* [AT117-e][312][NBIOT R16] PUR Response Window (Qualcomm)

**Status**: Started

 **Scope:** Discussion of whether correction is needed, and work on the CRs.

 **Intended outcome:** Report in R2-2203574, and revised CR (if needed – Tdocs can be allocated if necessary).

 **Deadline:** Thursday 24th February 1200 UTC

R2-2203574 Report on [AT117-e][312][NBIOT R16] PUR Response Window (Qualcomm) Qualcomm

## 9.1 NB-IoT and eMTC enhancements

(NB\_IOTenh4\_LTE\_eMTC6-Core; leading WG: RAN1; REL-17; WID: RP-211340)

Time budget: 1 TU

Tdoc Limitation: 1 tdocs

### 9.1.1 Organizational

LS in

36.300 running CR (Huawei)

36.331 running CR (Qualcomm)

36.304 running CR (Nokia)

36.306 running CR (ZTE)

[R2-2202124](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202124.zip) LS on Coverage-Based Carrier Selection (R3-221162; contact: Nokia) RAN3 LS in Rel-17 To:RAN2

* Noted
* We aim to reply ASAP
* [AT117-e][307][NBIOT/eMTC R17] Reply LS to RAN3 on coverage based carrier selection (Nokia)

Status: Started

 **Scope:** draft the reply LS to indicate agreements

 **Intended Outcome:** Approved LS in R2-2203576

 **Deadline:** Friday 25th February 1200 UTC

[R2-2202427](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202427.zip) Introduction of NB-IoT/eMTC Enhancements Qualcomm Incorporated CR Rel-17 36.331 16.7.0 4760 - B NB\_IOTenh4\_LTE\_eMTC6-Core

* Revised in in R2-2203577
* [AT117-e][308][NBIOT/eMTC R17] 36.331 CR (Qualcomm)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203577

 **Deadline:** EOM (likely continued post meeting)

[R2-2202743](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202743.zip) 36306 running CR for NB-IoT eMTC ZTE Corporation, Sanechips CR Rel-17 36.306 16.7.0 1841 - B NB\_IOTenh4\_LTE\_eMTC6-Core

* Revised in in R2-2203578
* [AT117-e][309][NBIOT/eMTC R17] 36.306 CR (ZTE)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203578

 **Deadline:** EOM (likely continued post meeting)

[R2-2203216](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203216.zip) Introduction of Rel-17 enhancements for NB-IoT and eMTC Huawei, HiSilicon CR Rel-17 36.300 16.7.0 1354 - B NB\_IOTenh4\_LTE\_eMTC6-Core

* Revised in in R2-2203579
* [AT117-e][310][NBIOT/eMTC R17] 36.300 CR (Huawei)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203579

 **Deadline:** EOM (likely continued post meeting)

[R2-2203217](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203217.zip%22%20%5Co%20%22https%3A//www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203217.zip) Introduction of Rel-17 enhancements for NB-IoT and eMTC Huawei, HiSilicon CR Rel-17 36.302 16.1.0 1211 - B NB\_IOTenh4\_LTE\_eMTC6-Core

* Revised in in R2-2203580
* [AT117-e][311][NBIOT/eMTC R17] 36.302 CR (Huawei)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203580

 **Deadline:** EOM (likely continued post meeting)

[R2-2203581](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203581.zip) Introduction of Rel-17 enhancements for NB-IoT and eMTC Nokia CR Rel-17 36.304 16.6.0 0844 - B NB\_IOTenh4\_LTE\_eMTC6-Core

* Revised in in R2-2203581
* [AT117-e][313][NBIOT/eMTC R17] 36.304 CR (Nokia)

**Status**: Starts Monday 28th February

 **Scope:** Update and work on the CR, include latest agreements

 **Intended Outcome:** Agreed CR in R2-2203581

 **Deadline:** EOM (likely continued post meeting)

### 9.1.2 Open Issues

Outcomes of:

[Pre117-e][301][NBIOT/eMTC R17] NB-IoT carrier selection (ZTE)

[Pre117-e][302][NBIOT/eMTC R17] Capabilities open issues (Huawei)

[Pre117-e][303][NBIOT/eMTC R17] Other open issues (Ericsson)

[R2-2202739](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202739.zip) Report of [Pre117e-301] Carrier selection open issues ZTE Corporation, Sanechips report Rel-17 NB\_IOTenh4\_LTE\_eMTC6-Core Late

**Proposals for easy agreement:**

Proposal 1: RAN2 introduces a new ue-SpecificDRX-CycleMin parameter which is configured per coverage level.

Proposal 2a: Same rules, e.g., to wait [xx] seconds or avoid paging carrier switching in PTW would be applied no matter UE selects legacy paging carrier or coverage-based paging carrier.

* Ericsson think this is OK as long as it happens between 2 consecutive paging occasions

Proposal 3: CQI report in Msg5 is conditionally mandatory for R17 UE that supports Rel-17 paging carrier selection. No other UE report is supported.

* QC think this report only provides a short term view and may not be suitable for longer term configuration of paging carrier, the report is not intended for this purpose and have a serious concern with this. Nokia thinks this report is not essential. Sequans, Thales agree with QC.
* Ericsson think this is better than nothing. Huawei thinks it is useful for eNB, and it is not the only information that can be used.
* Sequans think it can be supported and configured but conditionally mandatory is not necessary.

Proposal 4: RAN2 use the way of extending PCCH-ConfigList-NB to provide the R17 paging carrier list configuration in SIB.

Proposal 5a: It’s RAN2 assumption that the assigned information to UE in dedicated signaling also need to be delivered to core network and sent back to eNB in next paging.

Proposal 5b: UEPagingCoverageInformation RRC container is used to deliver the assigned information to UE in dedicated signaling to core network and sent back to eNB. A response LS to RAN3 would be sent as early as possible.

Proposal 6: It’s suggested to refine a previous agreement as below:

• In SIB, coverage specific nB is supported, e.g., a common nB value is configured for the R17 paging carrier(s) with same Rmax (npdcch-NumRepetitionPaging) coverage level.

**Proposal for further discussion:**

Proposal 2b: RAN2 discuss and make choice in the following options for reducing paging carrier switching:

• Option 1: For the case with eDRX configuration, just to simply specify that UE does not switch paging carrier within a PTW. For the case without eDRX configuration, a timer is specified to reduce paging carrier switching.

• Option 2: Only one timer is specified to reduce paging carrier switching in all the cases, e.g., regardless of whether UE is in PTW.

Proposal 2c: This timer in Option 1 or Option 2 in Proposal 2b can be started after UE selects legacy paging carrier or coverage-based paging carrier. UE is allowed to switch paging carrier if timer expires.

Proposal 2d: The length of the timer in Option 1 or Option 2 in Proposal 2b is configurable. RAN2 further discuss what’s the unit of the timer: DRX cycle or seconds?

|  |
| --- |
| Agreements* RAN2 introduces a new ue-SpecificDRX-CycleMin parameter which is configured per coverage level.
* Same rules, e.g., to wait a certain period of time or avoid paging carrier switching in PTW would be applied no matter UE selects legacy paging carrier or coverage-based paging carrier.
* RAN2 use the way of extending PCCH-Config-NB to provide the R17 paging carrier list configuration in SIB.
* It’s RAN2 assumption that the assigned information to UE in dedicated signaling also need to be delivered to core network and sent back to eNB in next paging.
* UEPagingCoverageInformation RRC container is used to deliver the assigned information to UE in dedicated signaling to core network and sent back to eNB. A response LS to RAN3 would be sent as early as possible.
 |

* [AT117-e][301][NBIOT/eMTC R17] Carrier Selection (ZTE)

**Status**: Started

 **Scope:** Progress and converge on remaining open issues.

 **Intended outcome:** Report in R2-2203575

 **Deadline:** Friday 25th February 1200 UTC

[R2-2202745](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202745.zip) ASN.1 issue and RAN3 impact of carrier selection ZTE Corporation, Sanechips discussion Rel-17 NB\_IOTenh4\_LTE\_eMTC6-Core

[R2-2203218](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203218.zip) Report of [Pre117-e][302][NBIOT/eMTC R17] Capabilities open issues (Huawei) Huawei, HiSilicon report Rel-17 NB\_IOTenh4\_LTE\_eMTC6-Core Late

[R2-2203384](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203384.zip) Report on [Pre117-e][303][NBIOTeMTC R17] Other open issues (Ericsson) Ericsson report Rel-17 Late

### 9.1.3 Other