3GPP TSG-RAN WG2 Meeting #109e R2-200xxxx

Online, 24 February – 6 March 2020

**Agenda item: 7.1.12**

**Source: Huawei (offline email discussion rapporteur)**

**Title: [AT109e][419][eMTC/NB-IoT] Connection to 5GC: Open Issues (Huawei)**

**Document for: Report**

# 1 Scope of the offline email discussion

This document contains the summary of the offline email discussion  [AT109e][419][eMTC/NB-IoT] Connection to 5GC: Open Issues”, as indicated below:

* [AT109e][419][eMTC/NB-IoT] Connection to 5GC: Open Issues (Huawei)

Scope: Further discussion to address the remaining issues, i.e., proposals S1-5, S2-2, S3-1, and identify potential agreements.

Intended outcome: Report with a list of proposals categorized as agreeable, need further discussion, postpone. The outcome can be provided in R2-2001885

Deadline: Tuesday, Mar 3rd 17:00 CET

Schedule: Wednesday, Mar 4th, 06:30 - 07:30 CET

Connection to 5GC was discussed in RAN2#109e based on R2-2002014 [1] with the following agreements:

**Agreements**

- DRBs are resumed upon receiving RRCConnectionResume in UP optimization when connected to 5GC.

- When idle mode eDRX is not configured, eMTC UEs in RRC\_INACTIVE monitor the paging occasions according to the shortest of the cell default paging cycle, the UE specific DRX (if configured), and the RAN paging cycle (if configured).

- When idle mode eDRX is not configured, eMTC UEs in RRC\_INACTIVE cannot be configured with values 5.12 sec and 10.24 sec

- DRB resumption for EDT for eMTC UEs connected to 5GC follows the same principle as in EPC, i.e.:

­ drb-ContinueROHC is provided in RRCConnectionRelease message triggering the suspension in RRC\_IDLE. The flag applies to all DRBs.

­ When resuming the DRBs for EDT, RRC procedure text triggers PDCP re-establishment and provides NR PDCP with the drb-ContinueROHC indication received in RRCConnectionRelease message.

The document discusses S1-5, S2-2, S3-1 in [1]

# 2 Discussion

## 2.1 Paging in RRC\_INACTIVE when idle mode eDRX is configured

**[1] Proposal S1-5:** Offline discussion on paging in RRC\_INACTIVE for eMTC UEs configured with idle mode eDRX:

* option 1: UE monitors paging occasions (POs) during CM-IDLE PTW according to the min {UE specific DRX cycle, default DRX cycle, RAN paging cycle} and monitor paging occasions outside CM-IDLE PTW according to RAN paging cycle.
* option 2 :
* If extended RAN paging cycles (i.e. 5.12, 10.24 Sec) are configured, UE monitors paging occasions according to RAN paging cycle
* If extended RAN paging cycles (i.e. 5.12, 10.24 Sec) are not configured, UE monitors paging occasions according to the min {UE specific DRX cycle, default DRX cycle, RAN paging cycle}

For details on the options, please refer to [3], [4] for option 1 and [2] for option 2.

It is proposed to discuss first the feasibility, pros and cons of the two options and then indicate company’s preference.

**Discussion Point P1-1: Indicate whether option 1 is feasible as well as the pros and cons of this option.**

|  |  |  |
| --- | --- | --- |
| **Company** | **is it feasible?** | **Comments** |
|  |  |  |
|  |  |  |

**Discussion Point P1-2: Indicate whether option 2 is feasible as well as the pros and cons of this option.**

|  |  |  |
| --- | --- | --- |
| **Company** | **is it feasible ?** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

**Discussion Point P1-3: Please indicate your company’s preference.**

|  |  |  |
| --- | --- | --- |
| **Company** | **option 1 / option 2** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

## 2.2 Remaining aspects related to DRB resumption

**[1] Proposal S2-2**: Offline discussion on remaining aspects related to DRB resumption, covering:

* full configuration
* particularities of NR PDCP

It is proposed to discuss the issues raised in [5] and also to indicate additional issues if any.

**Full Configuration during MO-EDT**

In [5], it is indicated that full configuration will trigger the release followed by establishment of all layer 2 entities in both UE and the ng-eNB and that, for EDT, it means that the data transmitted in MSG3 are lost. It is proposed to capture this case in stage 2.

**Proposal**: If RRCConnectionResume message received in response to MO-EDT includes fullConfig, then the UE shall consider that the data were not successfully transmitted.

**Discussion Point P2-1: Indicate whether you agree or not with the proposal and provide justifications.**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree with the proposal (yes/no)** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

**DRB suspension with NR PDCP**

In [5], it is mentioned that there is a new procedure ‘PDCP Suspend’ triggered at the time of suspension to RRC\_INACTIVE, which resets the COUNT. In [5], it is proposed to use the same procedure for the UP optimisation for eMTC UEs connected to 5GC.

**Proposal**: PDCP Suspend is triggered at the time of suspension to RRC\_IDLE for eMTC UEs connected to 5GC.

**Discussion Point P2-2: Indicate whether you agree or not with the proposal and provide justification.**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree with the proposal (yes/no)** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

**DRB resumption for non-EDT**

In [5], it is described that in rel-15 eLTE, upon reception of RRCConnectionResume to resume a connection from RRC\_INACTIVE, there is no automatic trigger of PDCP re-establishment nor specific handling for ROHC continuation. The related actions are triggered by the setting of the respective flags in nr-radioResourceConfig. In [5], it is proposed to follow the same approach for eMTC connected to 5GC for non-EDT.

**Proposal:** DRB resumption for non-EDT for eMTC UEs connected to 5GC follows the same principle as in RRC\_INACTIVE, i.e.:

* When resuming the DRBsfor non-EDT, RRC procedure text does not trigger PDCP re-establishment.
* PDCP re-establishment and ROHC continuation for each DRB are triggered by the presence of the respective flags in *RRCConnectionResume* message as specified in TS 38.331 [82], clause 5.3.5.6;

**Discussion Point P2-3: Indicate whether you agree or not with the proposal and provide.**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree with the proposal (yes/no)** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

**SRB1 resumption**

In [5], it is described that, in Rel-15 eLTE, to allow full configuration in RRCConnectionResume message, SRB1 is configured with default RLC and PDCP configuration when resuming the connection. In [5], it is proposed to follow the same approach for NB-IoT and eMTC connected to 5GC.

**Proposal**: When resuming the RRC connection, the default RLC configuration and default (NR) PDCP configuration is applied to SRB1 for eMTC and NB-IoT UEs connected to 5GC.

**Discussion Point P2-4: Indicate whether you agree or not with the proposal and provide justifications.**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree with the proposal (yes/no)** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

**NR PDCP configuration for SRB1**

In [5], it is described that, in Rel-15 eLTE, UE implicitly changes to NR-PDCP for SRB1 upon reception of RRCConnectionSetup in response to RRCConnectionResumeRequest. In [5], it is proposed to follow the same approach for eMTC connected to 5GC.

**Proposal**: Upon fallback to RRC connection establishment procedure during RRC connection resumption, eMTC UEs implicitly change to NR-PDCP for SRB1.

**Discussion Point P2-5: Indicate whether you agree or not with the proposal and provide justifications.**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree with the proposal (yes/no)** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

**Other**

**Discussion Point P2-6: Indicate any other potential issues related to the use of NR PDCP for eMTC UEs connected to 5GC**

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |

Conclusion: TBC

Proposal: TBC

## 2.3 Aligning Cat M definition with LTE-M indicator

[1] **Proposal S3-1**: Discuss the change in the e-mail discussion on the running eMTC 36.306 running CR or postpone to next meeting

In [6], it indicated that clarification in TS 36.306 is essential to ensure LTE-M indicator serves the purpose it is intended for. A text proposal is provided for inclusion in the eMTC running CR to TS 36.306.

**Proposal:** Changes proposed in section 2 of [6] be included in the eMTC running CR to TS 36.306.

**Discussion Point P3-1: Do you agree with the text proposal and do you have any comments on the suggested text**

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree with the text proposal** | **Comments** |
|  |  |  |
|  |  |  |

Conclusion: TBC

Proposal: TBC

# 3 Summary

**Conclusions:**

TBC

# 4 List of referenced documents

[1] [R2-2002014](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2002014.zip) Summary of contributions for connection to 5GC (AI 7.1.12) Huawei discussion

[2] [R2-2000538](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000538.zip) Page monitoring in RRC\_INACTIVE state with short eDRX Qualcomm India Pvt Ltd

[3] [R2-2000645](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000645.zip) Discussion on paging of RRC\_INACTIVE for eMTC connected to 5GC Huawei, HiSilicon, Ericsson

[4] [R2-2001211](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001211.zip) FFSs for supporting short eDRX in RRC\_INACTIVE for eMTC in 5GC ZTE Corporation, Sanechips

[5] [R2-2000646](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000646.zip) SRBs and DRBs handling for NB-IoT and eMTC connected to 5GC Huawei, HiSilicon

[6] [R2-2000311](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2000311.zip) Text proposal for 36.306 to align Cat M definition with LTE-M indicator Qualcomm