**3GPP TSG RAN WG1 Meeting #113 R1-2305851**

**Incheon, South Korea, May 22nd – May 26th, 2021**

**Agenda Item: 8.15**

**Source: Moderator (MediaTek)**

**Title: Initial input on RRC parameters for Rel-18 IoT NTN enhancements**

**Document for: Discussion and Decision**

# Introduction

Rapporteur is to provide initial input on higher layer signalling under agenda item 9.9 for Release 18 IoT\_NTN\_Enh according to RAN1#113 agenda.

# Disabling of HARQ feedback for IoT NTN

## Related RRC parameters

Based on the agreements to date (up to RAN1#112bis-e), an initial list of RRC parameters for Rel-18 IoT\_NTN\_Enh related to 9.9.3 Disabling of HARQ feedback is provided below:

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| **WI code** | **Sub-feature group** | **RAN1 specification** | **Section** | **RAN2 Parant IE** | **RAN2 ASN.1 name** | **Parameter name in the spec** | **New or existing?** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or Cell-specific** | **Specification** | **Comment** |
| IoT\_NTN\_Enh | HARQ feedback disabling for eMTC CE mode A and mode B | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-r18 | new | downlinkHARQ-FeedbackDisabled-r18 | **Used to disable the DL HARQ feedback, sent in the uplink, per HARQ process ID** | Bitmap [TBD length] | FFS | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for NB-IoT | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-NB-r18 | new | downlinkHARQ-FeedbackDisabled-NBr18 | **Used to disable the DL HARQ feedback, sent in the uplink, per HARQ process ID** | Bitmap [TBD length] | FFS | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for eMTC CE Mode B | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-DCI-r18 |  | downlinkHARQ-FeedbackDisabled-DCI-r18 | **Indicate whether DCI indication is used to directly indicate / override RRC configuration for disabling HARQ feedback** | BOOLEAN |  | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for NB-IoT | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-DCI-NB-r18 |  | downlinkHARQ-FeedbackDisabled-DCI-NB-r18 | **Indicate whether DCI indication is used to directly indicate / override RRC configuration for disabling HARQ feedback** | BOOLEAN |  | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for SPS PDSCH for eMTC CE Mode A | 36.213 |  |  |  | harq-FeedbackEnablingforSPSactive-r18 |  | harq-FeedbackEnablingforSPSactive-r18 | **If enabled, UE reports ACK/NACK for the first SPS PDSCH after activation, regardless of if HARQ feedback is enabled or disabled corresponding to the first SPS PDSCH after activation. Otherwise, UE follows configuration of HARQ feedback enabled/disabled corresponding to the first SPS PDSCH after activation** | BBOLEAN |  | Per UE | UE-specific | 36.331 |  |
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## Company views

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| **Companies** | **Comments** |
| Ericsson | * For the HL parameters related to the DCI-based solutions it has been written “downlinkHARQ-FeedbackDisabled-DCI”, to be equality descriptive for the semi-static approach, perhaps we should update the parameter name as follows “downlinkHARQ-FeedbackDisabled-Bitmap”. * One question, do we need to append “-r18”? If I’m not wrong the suffix “-r18” should be used when the parameter exists from before and a change has been made to it, in such cases there is a need to differentiate the parameter from the existing one by using the “-rXX” suffix. * There is a typo in the last row for NB-IoT: BBOLEAN |
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## Updated list of RRC parameters based on company views for first round

On Ericsson comments, moderator view is that proposed revisions are minor editorial revisions that are acceptable.

Based on comments, the revised list of RRC parameters for Rel-18 IoT\_NTN\_Enh related to 9.9.3 Disabling of HARQ feedback is provided below

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **WI code** | **Sub-feature group** | **RAN1 specification** | **Section** | **RAN2 Parant IE** | **RAN2 ASN.1 name** | **Parameter name in the spec** | **New or existing?** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or Cell-specific** | **Specification** | **Comment** |
| IoT\_NTN\_Enh | HARQ feedback disabling for eMTC CE mode A and mode B | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-Bitmap | new | downlinkHARQ-FeedbackDisabled-Bitmap | **Used to disable the DL HARQ feedback, sent in the uplink, per HARQ process ID** | Bitmap [TBD length] | FFS | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for NB-IoT | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-Bitmap-NB | new | downlinkHARQ-FeedbackDisabled-Bitmap-NB | **Used to disable the DL HARQ feedback, sent in the uplink, per HARQ process ID** | Bitmap [TBD length] | FFS | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for eMTC CE Mode B | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-DCI |  | downlinkHARQ-FeedbackDisabled-DCI | **Indicate whether DCI indication is used to directly indicate / override RRC configuration for disabling HARQ feedback** | BOOLEAN |  | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for NB-IoT | 36.213 |  |  |  | downlinkHARQ-FeedbackDisabled-DCI-NB |  | downlinkHARQ-FeedbackDisabled-DCI-NB | **Indicate whether DCI indication is used to directly indicate / override RRC configuration for disabling HARQ feedback** | BOOLEAN |  | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | HARQ feedback disabling for SPS PDSCH for eMTC CE Mode A | 36.213 |  |  |  | harq-FeedbackEnablingforSPSactive |  | harq-FeedbackEnablingforSPSactive | **If enabled, UE reports ACK/NACK for the first SPS PDSCH after activation, regardless of if HARQ feedback is enabled or disabled corresponding to the first SPS PDSCH after activation. Otherwise, UE follows configuration of HARQ feedback enabled/disabled corresponding to the first SPS PDSCH after activation** | BOOLEAN |  | Per UE | UE-specific | 36.331 |  |
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# Improved GNSS operations for IoT NTN

## Related RRC parameters

Based on the agreements to date (up to RAN1#112bis-e), an initial list of RRC parameters for Rel-18 IoT\_NTN\_Enh related to 9.9.4 Improved GNSS operations is provided below:

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| **WI code** | **Sub-feature group** | **RAN1 specification** | **Section** | **RAN2 Parant IE** | **RAN2 ASN.1 name** | **Parameter name in the spec** | **New or existing?** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or Cell-specific** | **Specification** | **Comment** |
| IoT\_NTN\_Enh | GNSS position fix in RRC Connected state for eMTC | 36.213 |  |  |  | GNSSGapLength-r18 | new | downlinkHARQ-FeedbackDisabled-r18 | **Indicates the length of configured GNSS measurement gap.** | The gap duration should be equal to or larger than the latest UE reported GNSS position fix time duration. | FFS | Per UE | UE-specific or cell- specific | 36.331 | The gap duration is equal to the latest reported GNSS position fix time duration for measurement when the duration for GNSS measurement gap is not included in the configuration by eNB |
| IoT\_NTN\_Enh | GNSS position fix in RRC Connected state for NB-IoT | 36.213 |  |  |  | GNSSGapLength-NB-r18 | new | downlinkHARQ-FeedbackDisabled-NB-r18 | **Indicates the length of configured GNSS measurement gap.** | The gap duration should be equal to or larger than the latest UE reported GNSS position fix time duration. | FFS | Per UE | UE-specific or cell- specific | 36.331 | The gap duration is equal to the latest reported GNSS position fix time duration for measurement when the duration for GNSS measurement gap is not included in the configuration by eNB |
| IoT\_NTN\_Enh | GNSS assistance information report for eMTC | 36.213 |  |  |  | GNSSPositionFixtDuration-r18 | new | GNSSPositionFixtDuration-r18 | **UE reports GNSS position fix time duration for measurement at least during the initial access stage [and in connected mode]** | N-bit field at least including with [1,2] seconds as candidate component values  FFS: value of N, other component value(s) of candidate GNSS position fix time duration (e.g. N=3, with value in [1,2,3,7,13,19,25, X] seconds, and X is FFS). | FFS | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | GNSS assistance information report for NB-IoT | 36.213 |  |  |  | GNSSPositionFixtDuration-NB-r18 | new | GNSSPositionFixtDuration-NB-r18 | **UE reports GNSS position fix time duration for measurement at least during the initial access stage [and in connected mode]** | N-bit field at least including with [1,2] seconds as candidate component values  FFS: value of N, other component value(s) of candidate GNSS position fix time duration (e.g. N=3, with value in [1,2,3,7,13,19,25, X] seconds, and X is FFS). | FFS | Per UE | UE-specific | 36.331 |  |
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## Company views

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| **Companies** | **Comments** |
| Ericsson | * One question, do we need to append “-r18”? If I’m not wrong the suffix “-r18” should be used when the parameter exists from before and a change has been made to it, in such cases there is a need to differentiate the parameter from the existing one by using the “-rXX” suffix. * Typo: GNSSPositionFixtDuration --> GNSSPositionFix~~t~~Duration * Parameter name is incorrect: * downlinkHARQ-FeedbackDisabled-r18 🡪 GNSSGapLength-r18 * downlinkHARQ-FeedbackDisabled-NB-r18 🡪 GNSSGapLength-NB-r18 |
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## Updated list of RRC parameters based on company views for first round

On Ericsson comments, moderator view is that proposed revisions are minor editorial revisions that are acceptable.

Based on comments, a revised list of RRC parameters for Rel-18 IoT\_NTN\_Enh related to 9.9.4 Improved GNSS operations is provided below:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **WI code** | **Sub-feature group** | **RAN1 specification** | **Section** | **RAN2 Parant IE** | **RAN2 ASN.1 name** | **Parameter name in the spec** | **New or existing?** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or Cell-specific** | **Specification** | **Comment** |
| IoT\_NTN\_Enh | GNSS position fix in RRC Connected state for eMTC | 36.213 |  |  |  | GNSSGapLength | new | GNSSGapLength | **Indicates the length of configured GNSS measurement gap.** | The gap duration should be equal to or larger than the latest UE reported GNSS position fix time duration. | FFS | Per UE | UE-specific or cell- specific | 36.331 | The gap duration is equal to the latest reported GNSS position fix time duration for measurement when the duration for GNSS measurement gap is not included in the configuration by eNB |
| IoT\_NTN\_Enh | GNSS position fix in RRC Connected state for NB-IoT | 36.213 |  |  |  | GNSSGapLength-NB | new | GNSSGapLength-NB | **Indicates the length of configured GNSS measurement gap.** | The gap duration should be equal to or larger than the latest UE reported GNSS position fix time duration. | FFS | Per UE | UE-specific or cell- specific | 36.331 | The gap duration is equal to the latest reported GNSS position fix time duration for measurement when the duration for GNSS measurement gap is not included in the configuration by eNB |
| IoT\_NTN\_Enh | GNSS assistance information report for eMTC | 36.213 |  |  |  | GNSSPositionFixDuration | new | GNSSPositionFixDuration | **UE reports GNSS position fix time duration for measurement at least during the initial access stage [and in connected mode]** | N-bit field at least including with [1,2] seconds as candidate component values  FFS: value of N, other component value(s) of candidate GNSS position fix time duration (e.g. N=3, with value in [1,2,3,7,13,19,25, X] seconds, and X is FFS). | FFS | Per UE | UE-specific | 36.331 |  |
| IoT\_NTN\_Enh | GNSS assistance information report for NB-IoT | 36.213 |  |  |  | GNSSPositionFixtDuration-NB | new | GNSSPositionFixtDuration-NB | **UE reports GNSS position fix time duration for measurement at least during the initial access stage [and in connected mode]** | N-bit field at least including with [1,2] seconds as candidate component values  FFS: value of N, other component value(s) of candidate GNSS position fix time duration (e.g. N=3, with value in [1,2,3,7,13,19,25, X] seconds, and X is FFS). | FFS | Per UE | UE-specific | 36.331 |  |
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