**3GPP TSG RAN WG1 #117 R1-2405567**

**Fukuoka City, Fukuoka, Japan, May 20th—24th, 2024**

**Agenda item:** 8.2

**Source:** Moderators (AT&T, NTT DOCOMO, INC.)

**Title:** UpdatedRAN1 UE features list for Rel-18 LTE after RAN1#117

**Document for:** Endorsement

1. Introduction

This contribution includes the updated RAN1 UE features list for Rel-18 LTE after RAN1 #116 meeting.

1. NR\_SL\_enh2

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Void

1. IoT\_NTN\_enh

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the eNB to know if the feature is supported | Need for the UE to know if the feature is supported (only for V2X WI, where the PC5-RRC capability signalling is delivered between the UEs) | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | Need of FDD/TDD differentiation | Capability interpretation for mixture of FDD/TDD | Note | Mandatory/Optional |
| 2. IoT\_NTN\_enh | 2-1a-1 | Semi-static HARQ feedback disabling for eMTC CE mode B in single TB case | 1. UE gets RRC configuration for disabling HARQ feedback per UE per process | Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE with CE mode B cannot disable HARQ feedback in single TB case | Per UE | No  | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1b-1 | Dynamic HARQ feedback disabling by DCI-based direct indication for eMTC CE mode B in single TB case | 1. UE receives DCI indication to directly indicate disabling HARQ feedback | Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE with CE mode B cannot disable HARQ feedback in single TB case | Per UE | No  | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1c-1 | Dynamic HARQ feedback disabling by DCI-based overridden indication for eMTC CE mode B in single TB case | 1. UE receives DCI indication to override RRC configuration for disabling HARQ feedback  | Rel.17 2-1, Rel-18 2-1a-1, 2-1b-1 | Yes | N/A | Release 18 eMTC UE with CE mode B cannot disable HARQ feedback in single TB case | Per UE | No  | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1a-2 | Semi-static HARQ feedback disabling for eMTC CE mode B in multi TB case | 1. UE gets RRC configuration for disabling HARQ feedback per UE per process | Rel-16 1-11,Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE with CE mode B cannot disable HARQ feedback in multi TB case | Per UE | No  | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1b-2 | Dynamic HARQ feedback disabling by DCI-based direct indication for eMTC CE mode B in multi TB case | 1. UE receives DCI indication to directly indicate ~~/ override RRC configuration for~~ disabling HARQ feedback | Rel-16 1-11,Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE with CE mode B cannot disable HARQ feedback in multi TB case | Per UE | No  | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1c-2 | Dynamic HARQ feedback disabling by DCI-based overridden indication for eMTC CE mode B in multi TB case | 1. UE receives DCI indication to override RRC configuration for disabling HARQ feedback  | Rel-16 1-11,Rel.17 2-1, Rel-18 2-1a-2, 2-1b-2 | Yes | N/A | Release 18 eMTC UE with CE mode B cannot disable HARQ feedback in multi TB case | Per UE | No  | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1d-1 | Semi-static HARQ feedback disabling for eMTC CE mode A in single TB case | 1. UE gets RRC configuration for disabling HARQ feedback per UE per process | Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE with CE mode A cannot disable HARQ feedback in single TB case | Per UE | No | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1d-2 | Semi-static HARQ feedback disabling for eMTC CE mode A in multi TB case | 1. UE gets RRC configuration for disabling HARQ feedback per UE per process | Rel-16 1-10,Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE with CE mode A cannot disable HARQ feedback in multi TB case | Per UE | No | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-2 | Semi-static HARQ feedback disabling for SPS PDSCH for eMTC CE Mode A | UE reports ACK/NACK for the first SPS PDSCH after activation if enabled, and follow per-process HARQ feedback enabled/disabled configuration otherwise | Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE Mode A cannot disable HARQ feedback for SPS PDSCH | Per UE | No  | No |  | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1e-1 | Semi-static HARQ feedback disabling for NB-IoT in single TB case | 1. UE gets RRC configuration for disabling HARQ feedback per UE per process | Rel. 17 2-1b | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in single TB case | Per UE | No  | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1f-1 | Dynamic HARQ feedback disabling by DCI-based direct indication for NB-IoT in single TB case | 1. UE receives DCI indication to directly indicate disabling HARQ feedback  | Rel. 17 2-1b | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in single TB case | Per UE | No  | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1g-1 | Dynamic HARQ feedback disabling by DCI-based overridden indication for NB-IoT in single TB case | 1. UE receives DCI indication to override RRC configuration for disabling HARQ feedback 2. For single TB scheduled by single DCI, UE follows NPDCCH monitoring behavior for a HARQ process configured as HARQ feedback disabled by per-HARQ process bitmap signaling and further reversed to HARQ feedback enabled by DCI | Rel. 17 2-1b, Rel-18 2-1e-1, 2-1f-1  | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in single TB case | Per UE | No  | No | Note: this applies to single-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1e-2 | Semi-static HARQ feedback disabling for NB-IoT in multi TB case | 1. UE gets RRC configuration for disabling HARQ feedback per UE per process  | At least one of {Rel-16 2-6, 2-7},Rel. 17 2-1b | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in multi TB case | Per UE | No  | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1f-2 | Dynamic HARQ feedback disabling by DCI-based direct indication for NB-IoT in multi TB case | 1. UE receives DCI indication to directly indicate for disabling HARQ feedback  | At least one of {Rel-16 2-6, 2-7},Rel. 17 2-1b | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in multi TB case | Per UE | No  | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-1g-2 | Dynamic HARQ feedback disabling by DCI-based overridden indication for NB-IoT in multi TB case | 1. UE receives DCI indication to override RRC configuration for disabling HARQ feedback 2. For multi TB scheduling a single transport block by single DCI, UE follows NPDCCH monitoring behavior for a HARQ process configured as HARQ feedback disabled by per-HARQ process bitmap signaling and further reversed to HARQ feedback enabled by DCI | At least one of {Rel-16 2-6, 2-7},Rel. 17 2-1b,Rel-18 2-1e-2, 2-1f-2 | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in multi TB case | Per UE | No  | No | Note: this applies to multi-TB case | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-3a | GNSS position fix in RRC Connected state for eMTC—triggered  | 1. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete and RRCConnectionReconfigurationComplete for HO case 2. UE receives eNB GNSS measurement trigger 4. UE re-acquires GNSS position fix within a configured gap5. UE reports the remaining GNSS validity duration with MAC CE in connected mode | Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE cannot get triggered GNSS position fix in RRC Connected state | Per UE | No  | No | Note: This applies to non-DRX | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-4a | GNSS position fix in RRC Connected state for eMTC—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete and RRCConnectionReconfigurationComplete for HO case3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | [Rel. 18 2-3a] Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No  | No | Note: This applies to non-DRX | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-3b | GNSS position fix in RRC Connected state for NB-IoT—triggered | 1. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete-NB 2. UE receives eNB GNSS measurement trigger 4. UE re-acquires GNSS position fix within a configured gap5. UE reports the remaining GNSS validity duration with MAC CE in connected mode | Rel. 17 2-1b | Yes | N/A | Release 18 NB-IoT UE cannot get triggered GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-4b | GNSS position fix in RRC Connected state for NB-IoT—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete-NB3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | [Rel. 18 2-3b], Rel. 17 2-1b |  |  | Release 18 NB-IoT UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-5a | UL transmission extension after original validity duration expires for eMTC | 1. UE is allowed to transmit UL in a duration X after original GNSS validity duration expires without GNSS re-acquisition when enabled by the network | Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE cannot get UL extension in RRC Connected state | Per UE | No  | No |  | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-5b | UL transmission extension after original validity duration expires for NB-IoT | 1. UE is allowed to transmit UL in a duration X after original GNSS validity duration expires without GNSS re-acquisition when enabled by the network | Rel. 17 2-1b | Yes | N/A | Release 18 NB-IoT UE cannot get UL extension in RRC Connected state | Per UE | No  | No |  | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-2a | NGSO for HARQ disabling for eMTC | Support of NGSO for HARQ disabling for eMTC | At least one of 2-1a-12-1b-12-1c-12-1a-22-1b-22-1c-22-1d-12-1d-22-2 | Yes | N/A | NGSO is not supported for HARQ disabling for eMTC  | Per UE | No | No |  | Optional with capability signaling |
| 2. IoT\_NTN\_enh | 2-2b | NGSO for HARQ disabling for NB-IoT | Support of NGSO for HARQ disabling for NB-IoT | At least one of 2-1e-12-1f-12-1g-12-1e-22-1f-22-1g-2 | Yes | N/A | NGSO is not supported for HARQ disabling for NB-IoT | Per UE | No | No |  | Optional with capability signaling |
| 2. IoT\_NTN\_enh | 2-6a | NGSO for GNSS enhancements for eMTC | Support of NGSO for GNSS enhancements for eMTC | At least one of 2-3a, 2-4a, 2-5a | Yes | N/A | NGSO for GNSS enhancements for eMTC is not supported  | Per UE | No | No |  | Optional with capability signaling |
| 2. IoT\_NTN\_enh | 2-6b | NGSO for GNSS enhancements for NB-IoT | Support of NGSO for GNSS enhancements for NB-IoT | At least one of 2-3b, 2-4b, 2-5b | Yes | N/A | NGSO for GNSS enhancements for NB-IoT is not supported  | Per UE | No | No |  | Optional with capability signaling |