**3GPP TSG RAN WG2 #113-e R2-210xxxx**

**e-Meeting, January 25th – February 5th, 2021**

**Agenda item:** 6.2.1

**Source:** Moderators (Intel Corporation)

**Title:** RAN2 UE features list for Rel-16 NR

**Document for:** Information

1. Introduction

This contribution summarizes the following discussion:

* [Post112-e][062][NR16] RAN2 Feature List for TR (Intel)

Scope: Create the 1st R2 feature list.

Intended outcome: Create the 1st agreeable R2 feature list, to be a baseline for final list ready for March.

Deadline: Long

The RAN2 feature list in Annex contains only the UE capabilities/features that are introduced by RAN2 and are not in RAN1 and RAN4 feature lists.

Please carefully review the RAN2 feature list in the Annex and provide your comments in Section 2 (for comments on the features already in the list) and 3 (for missing features in the list).

The email discussion in organised into 2 phases:

Phase 1: Review the RAN2 feature list until 6 January 2021

Phase 2: Rapporteur provides resolution by the 9 January for final review

# 2. Comments on the listed features

Q1 Any comments on the listed features?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company** | **Feature no.** | **Comment raised** | **Proposals** | **Rapporteur’s resolution** |
| Huawei  (Yiru Kuang) | 11-1 | This is mandatory for IAB-MT but for sure it not applies to UE. There is no capability signalling on this. | Change “Mandatory with capability signaling” to “Mandatory without capability signaling for IAB-MT”. | Agree to the change |
| Huawei | 11-8 | The name of FG cannot reflect the feature accurately. | Change “Bearer mapping” to “Two-octet eLCID”. | Agree to change “Bearer mapping” to “LCID extension”  [Huawei] In Rel-16, two types of LCID extension are introduced, i.e. one-octet and two-octet. So we understand “Two-octet eLCID” may be more accurate but no very strong view.  {Rapp} It is just a high level feature name. So we think ‘LCID extension’ is sufficient. |
| Huawei | 11-9 | The name of FG only covers the first component. The 3 components are independent.  It should be “Optional with capability signaling”. | To split those 3 components into 3 different FGs.  Add “Optional with capability signaling” in Mandatory/Optional column. | Agree to the change |
| Huawei | 11. NR\_IAB-Core | For all IAB features, we understand they are applicable to IAB-MT rather than UE. We wonder whether it is necessary to add “for IAB-MT”. | Change “Optional with capability signaling” to “Optional with capability signaling **for IAB-MT**”. | Agree to the change |
| Huawei | 12-1 | The descripiton of Components is not accurate. | Change to “Indicates whether the UE supports consistent uplink LBT **failure** detection and recovery”. | Agree to the change.  [Huawei] Thanks. But it seems implemented incorrectly. “…uplink LBT failure detection ~~failure~~ and recovery…”  {Rapp} Corrected. |
| Huawei | 15-1 | The descripiton of Components and Field name/Parent IE are not accurate. | Change to “Indicates whether the UE supports provision of referenceTimeInfo in *DLInformationTransfer* message and in SIB9**,** and **whether the UE supports** reference time information preference indication via assistance information”.  Field name in TS 38.331 includes:  1) referenceTimeProvision-r16  2) referenceTimeInfoPreference-r16  Parent IE in TS 38.331 includes:  1) UE-NR-Capability-v1610  2) UEAssistanceInformation | It is not wrong and is aligned to 38.306. Hence prefer not to change |
| Huawei | 15-2 | The descripiton of Components is not accurate. | Change to “2) Indicates whether the UE supports restricting data transmission from a given LCH to a configured (sub-) set of dynamic grant **with certain** priority levels”. | It is not wrong and is aligned to 38.306. Hence prefer not to change |
| Huawei | 17-10/17-11 | Field name and Parent IE are wrong. | pcellT312-r16 and pscellT312-r16, as well as the Parent IE need to be swapped for 17-10 and 17-11. | Agree to the change |
| Huawei | 18-6 | The first 18-3 is a LTE UE capability parameter, should not be replaced with 18-3 which is referring to NR feature, even though the paramenter names are same. | Change to “2) Support of EN-DC or NGEN-DC, and ***resumeWithSCG-Config-r16*~~18-3~~** as specified in TS 36.331 [yy]”. | Agree to the change |
| Huawei | 21-2/21-3 | Indicates whether the UE supports the additional values of *T-PollRetransmit timer*. The “timer” should not be italic. | The “timer” can be either removed or corrected. | Agree, Change them to non-italic |
| Lenovo | 14-1 | It’s an optional feature w/o capability signalling. | The concerned entries for XDD/FRX differentiation should be corrected to “N/A”. | Agree to the change |
| Lenovo | 16-1, 16-2, 16-3 | The capabilities are specified in 37.355, and there is no XDD and FRX differentiation specified in 37.355. | Spec reference 38.331 for field name and Parent IE needs to be changed to 37.355; the entries for XDD and FRX differentiation should be set to “N/A” instead of “No”. | Agree to the change |
| Lenovo | 22 | The inter-RAT parameter “supportedBandListUTRA-FDD” is missing. | Add “supportedBandListUTRA-FDD” as 22-2. | Agree to the change |
| Lenovo | 24-8 to 24-8f | The features are part of Rel-16 NR RRM Enhancement and already listed as 9-6, 9-7 in RAN4 feature list. | We wonder whether there is a need to list them again in the Annex-24. | Agree to the change |
| Lenovo | 24-13 | For mandatory features the XDD and FRX differentiation does not apply. | The entries for XDD and FRX differentiation should be set to “N/A” instead of “No”. | Agree to the change |
| ZTE | 22-1 | “-r16” missed | *handoverUTRA-FDD-r16* | Agree to the change |
| ZTE | 24-10 | “-r16” missed | *voiceFallbackIndicationEPS-r16* | Agree to the change |
| ZTE | 24-11 | FRX differentiation does not apply. | The FRX differentiation field should be set to “N/A” instead of “No”. | Agree to the change |
| LG | 18-8 | This feature concerns NR measurements, not E-UTRA measurements | Change the feature group to “RRM during IDLE/INACTIVE – Support of NR SSB measurement and reporting upon network request” | Agree to the change |
| OPPO | 13-5 | In R2 feature list, just wonder if this NOTE should be for 13-8 instead of 13-5? | Move the note to 13-8 | Agree to the change |

# 3. Comments on the listed features

Q2. Any RAN2 feature missed? If yes, please include also the full feature group description in Q2-1

|  |  |  |
| --- | --- | --- |
| **Company** | **Missing RAN2 feature** | **Rapporteur’s resolution** |
| Huawei | There are some RAN2 features for NR\_pos-Core captued in 37.355, and some capabilties related to MDT or TEI16 captured in 36.331, we wonder if these capabilites need to be added as well, e.g. in a separate section. | For positioning, we have captured them either here or in R1 and R4 feature list for 37.355. Please let us know which ones are missing.  [Huawei] I further add some features for 37.355, please see table below from 16-4 to 16-9.  {Rapp} Added. Thanks  We do not captured capabilities for 36.331. |
| Huawei | *interCA-NonAlignedFrame-B-r16*  *trs-AdditionalBandwidth-r16*  These two features were disucssed and introduced in RAN plenary and should be capture in RAN2 or RAN1 feaure list. If it is preferred to be added in RAN1 feature list, maybe a LS to RAN1 is needed. | We have actually captured this in the R1 feature list. Can discuss online whether it needs a LS |
| Huawei | *recommendedBitRateMultiplier-r16*  It was introdcued in RAN2#109 R2-2002176~R2-2002181. Please see table below 24-X. | Agree to add as per proposed. |
| Huawei | 1) *supportedCSI-RS-ResourceListAlt-r16*  2) *codebookVariantsList-r16*  It was introdcued in RAN2#110 R2-2006203/R2-2006204. We are open to add them in one FG as two separate componets or add them in two FGs. Please see table below 24-Y with assumption of adding in one FG. | We have included this in the R1-feature list  [Huawei] We didn’t find it in R1-feature list, it was raised and discussed in RAN2 TEI16, so we understand it can be added in RAN2 feature list, or could you please tell us the explicit FG?  {Rapp} I should have said it will be added to the R1 feature table. |
| Lenovo | In Annex-24: Introduction of a second SMTC per frequency carrier in idle/inactive (smtc2-LP-r16 in SIB2/SIB4).  Need to be clarified whether it is e.g. mandatory for the UE w/o capability signaling or conditionally mandatory. | Agree, this a new feature since it is a CAT-B CR. Hence it should be added as ‘Mandatory without capability signalling’ since the text seems to mandate the UE implementation |
| Lenovo | In Annex-24: PRACH prioritization parameters for MPS and MCS in RACH-ConfigCommon.  Need to be clarified whether it is mandatory, conditionally mandatory or optional for the UE w/o capability signaling. | Agree, adding it as ‘Mandatory without capability signalling’ since it is not specified in Section 5 and 6 of 38.306 and the 38.321 text seems to mandate the UE implementation  [Huawei] In the cover sheet of agreed CR R2-2002102, it describes “The feature is optional…”, so we understand it is “Optional without capability signalling” and needs to be added in 38.306.  {Rapp} The full sentence is ‘The feature is optional and can be enabled on a per gNB basis.’. So the optionaility is from the gNB. The 38.321 text below seems to mandate the UE implementation:  2> else if *ra-PrioritizationForAccessIdentityTwoStep* is configured for the selected carrier  2> else if *ra-PrioritizationForAccessIdentity* is configured for the selected carrier; and |
| Lenovo | In Annex-24: eCall over IMS for NR.  Need to be clarified whether it is e.g. optional for the UE w/o capability signaling or conditionally mandatory for a UE that is IMS voice capable in NR. | Since it is not specified in Section 5 and 6 of 38.306, we are reluctant to include it in the feature list. |
| Lenovo | In Annex-24: Mandatory support of full rate user plane integrity protection | Our understanding is that this is not a new feature but just a setting of the value use for an existing feature. Feature is already there in Rel-15. Hence we don’t think this is to be included in the feature list |
| Lenovo | In Annex-24: UAC-AC1-SelectAssistInfo-r16 in SIB1.  Need to be clarified whether it is e.g. optional for the UE w/o capability signaling or conditionally mandatory for a UE that is delay tolerant. | Feature is already there in Rel-15. Also this is CAT-F CR so it is just correction of the Rel-15 feature and thus is not a new feature.  Hence we don’t think this is to be included in the feature list |
| ZTE | As added in Q2 Annex-22-2“supportedBandListUTRA-FDD-r16”  similar to lenovo mentioned in the last question, but the name shall be with suffix -r16. | Agree to add as Lenovo’s comments. |
|  |  |  |
|  |  |  |

Q2-1 Please list the missing RAN2 feature below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group (general description of the feature)** | **Components (Copy from field description)** | **Prerequisite feature groups (i.e. Include the field name that need to be supported in order to support this feature)** | **Field name in TS 38.331 [2]** | **Parent IE in TS 38.331 [2]** | **Need of FDD/TDD differentiation**  **(i.e. Check column FDD/TDD diff (set to Yes/No/NA) in 38.306)** | **Need of FR1/FR2 differentiation**  **(i.e. Check column FR1/FR2 diff (set to Yes/No/NA) in 38.306)** | **Note**  **(includes any notes in the field description in 38.306)** | **Mandatory/Optional**  **(i.e.Check column in M (=Yes, No, CY) in 38.306) – If CY, copy the condition when the feature is mandatory or optional from the field description** |
| **24. TEI16/Others** | **24-X** | Bit rate multiplier for recommended bit rate MAC CE | Indicates whether the UE supports the bit rate multiplier for recommended bit rate MAC CE as specified in TS 38.321 [xx], clause 6.1.3.20. | *recommendedBitRate* | *recommendedBitRateMultiplier-r16* | *MAC-ParametersCommon* | No | No |  | **Optional with capability signaling** |
| **24. TEI16/Others** | **24-Y** | CSI-RS capabilities extension per codebook type | 1) Indicates the list of supported CSI-RS resources across all bands in a band combination by referring to *codebookVariantsList* as specified in TS 38.331[x].  2) Indicates the list of *SupportedCSI-RS-Resource* as specified in TS 38.331[x] applicable to the codebook types supported by the UE. | *codebookParameters* | 1) *supportedCSI-RS-ResourceListAlt-r16*  2) *codebookVariantsList-r16* | 1) *CodebookParameters-v16xy*  2) *Phy-ParametersCommon* | No | No | For each codebook type, *supportedCSI-RS-ResourceListAlt-r16* shall be included in both *codebookParametersPerBC* and *codebookParametersPerBand*. | **Optional with capability signaling** |
| 22SRVCC\_NR\_to\_UMTS-Core | 22-2 | SupportedBandList UTRA-FDD | *Radio frequency bands* defined in 4.5.7, TS 25.306 [x] | supportedBandListUTRA-FDD-r16 | supportedBandListUTRA-FDD-r16 | UTRA-FDD-Parameters-r16 | No | N/A |  | **Optional with capability signaling** |
| **16. NR\_pos-Core** | **16-4** | Positionig Modes for DL-TDOA | Indicates what positoining mode the UE supports for DL-TDOA. The positioning mode incldues standalone, ue-based, and ue-assisted |  | *nr-DL-TDOA-Mode-r16* | *NR-DL-TDOA-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-5** | Positioning Modes for DL-AoD | Indicates what positoining mode the UE supports for DL-TDOA. The positioning mode incldues standalone, ue-based, and ue-assisted |  | *nr-DL-AoD-Mode-r16* | *NR-DL-AOD-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-6** | SSR URS | Indicates whether the UE support SSR URS |  | *gnss-SSR-URA-Support-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-7** | SSR Phase Bias | Indicates whether the UE support SSR Phase Bias |  | *gnss-SSR-PhaseBiasSupport-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-8** | SSR STEC Correction | Indicates whether the UE support SSR STEC Correction |  | *gnss-SSR-STEC-CorrectionSupport-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-9** | SSR Gridded Correction | Indicates whether the UE support SSR Gridded Correction |  | *gnss-SSR-GriddedCorrectionSupport-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |

# 4. Annex: RAN2 feature list

Annex-11: NR\_IAB-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 11. NR\_IAB-Core | 11-1 | Basic BAP procedures | 1) Routing  2) Bearer mapping  3) IP assignment over RRC |  | N/A | N/A | N/A | N/A |  | Mandatory without capability signalling for IAB MT |
| 11-2 | HbH flow control | 1) Indicates whether the IAB-MT supports flow control procedures and flow control feedback per backhaul RLC channel, as specified in TS 38.340 [y].  2) Indicates whether the IAB-MT supports flow control procedures and flow control feedback per Routing ID, as specified in TS 38.340 [y]. |  | 1) *flowControlBH-RLC-ChannelBased-r16*  2) *flowControlRouting-ID-Based-r16* | *BAP-Parameters-r16* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-3 | RLF handling | Indicates whether the IAB-MT supports BH RLF indication handling as specified in TS 38.331 [x] and in TS 38.340 [y]. |  | *bh-RLF-Indication-r16* | *UE-NR-Capability-v16xy* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-4 | QoS | Indicates whether the IAB-MT supports flow-based QoS and multiple flows to 1 DRB mapping, as specified in TS 37.324 [z]. |  | *sdap-QOS-IAB-r16* | *SDAP-Parameters* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-5 | HD format | Indicates whether the IAB-MT supports UL SDAP header and SDAP End-marker, as specified in TS 37.324 [z]. |  | *sdapHeaderIAB-r16* | *SDAP-Parameters* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-6 | DRB handling | 1) Indicates whether the IAB-MT supports DRB configuration including split DRB with one UL path, (de)ciphering on DRB and PDCP status reporting.  2) Indicates whether the IAB-MT supports SRB2 configuration without a DRB, as specified in TS 38.331 [x]. |  | *1) drb-IAB-r16*  *2) non-DRB-IAB-r16* | *PDCP-Parameters* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-7 | Scheduling | Indicates whether the IAB-MT supports Pre-emptive BSR as specified in TS 38.321 [xx]. |  | *preEmptiveBSR-r16* | *MAC-ParametersCommon* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-8 | LCID extension | Indicates whether the IAB-MT supports extended Logical Channel ID space using two-octet eLCID, as specified in TS 38.321 [xx]. |  | *lcid-ExtensionIAB-r16* | *MAC-ParametersCommon* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-9a | F1AP over LTE leg signaling for EN-DC IAB-MT | Indicates whether the IAB-MT supports F1-C signalling over *DLInformationTransfer* and *ULInformationTransfer* messages via MN when IAB-MT operates in EN-DC mode, as specified in TS 36.331 [yy]. |  | *f1c-OverEUTRA-r16* | *GeneralParametersMRDC-v1610* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-9b | F1AP over LTE leg signaling for EN-DC IAB-MT | Indicates whether the IAB-MT supports SCG DRB with NR PDCP when IAB-MT operates in EN-DC mode. |  | *scg-DRB-NR-IAB-r16* | *PDCP-ParametersMRDC-v1610* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-9c | F1AP over LTE leg signaling for EN-DC IAB-MT | Indicates whether the IAB-MT supports NR measurement and reports while in EUTRA connected and event B1-based measurement and reports while in EUTRA connected. |  | *interNR-MeasEUTRA-IAB-r16* | *MeasAndMobParametersMRDC-v1610* | No | No |  | Optional with capability signalling for IAB-MT |
| 11-10 | Intra-frequency HO | Indicates whether the IAB-MT supports intra-frequency HO. It indicates the support for intra-frequency HO from the corresponding duplex mode if this capability is included in *fdd-Add-UE-NR-Capabilities* or *tdd-Add-UE-NR-Capabilities*. It indicates the support for intra-frequency HO in the corresponding frequency range if this capability is included in *fr1-Add-UE-NR-Capabilities* or *fr2-Add-UE-NR-Capabilities*. |  | *handoverIntraF-IAB-r16* | *MeasAndMobParametersFRX-Diff; MeasAndMobParametersXDD-Diff* | N/A | N/A | IAB-MT shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Optional with capability signaling for IAB-MT |
| 11-11 | Multiple frequency band indication | Indicates whether the IAB-MT supports multiple frequency band indication. |  | *mfbi-IAB-r16* | *MeasAndMobParametersCommon* | No | No |  | Optional with capability signaling for IAB-MT |
| 11-12 | Direct SN addition | Indicates whether the IAB-MT supports direct SN addition in the first RRC connection reconfiguration after RRC connection establishment. |  | *directSN-AdditionFirstRRC-IAB-r16* | *UE-NR-Capability-v16xy* | No | No |  | Optional with capability signaling for IAB-MT |
|  |  |  |  |  |  |  |  |  |  |  |

Annex-12: NR\_unlic-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 12. NR\_unlic-Core | 12-1 | UL LBT failure detection and recovery | Indicates whether the UE supports consistent uplink LBT failure detection and recovery, as specified in TS 38.321 [xx], for cells operating with shared spectrum channel access. |  | *ul-LBT-FailureDetectionRecovery-r16* | *MAC-ParametersCommon* | No | No | This feature applies to all serving cells with which the UE is configured with shared spectrum channel access. | Optional with capability signaling |
|  |  |  |  |  |  |  |  |  |  |

Annex-13: 5G\_V2X\_NRSL-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 13. 5G\_V2X\_NRSL-Core | 13-1 | Sidelink General Parameters | Indicates the access stratum release for NR sidelink communication the UE supports as specified in TS 38.331 |  | *accessStratumReleaseSidelink-r16* | *UECapabilityInformationSidelink-IEs-r16* | No | No |  | Mandatory with capability signalling |
| 13-2 | Sidelink PDCP parameters | Indicates whether UE supports out of order delivery of data to upper layers by PDCP for sidelink |  | *outOfOrderDeliverySidelink-r16* | *PDCP-ParametersSidelink-r16* | No | No |  | Optional with capability signaling |
| 13-3 | Sidelink RLC parameters – Support AM DRB with 18-bit length RLC SN | Indicates whether the UE supports AM DRB with 18-bit length of RLC sequence number for sidelink |  | *am-WithLongSN-Sidelink-r16* | *RLC-ParametersSidelink-r16* | No | No |  | Optional with capability signaling |
| 13-4 | Sidelink RLC parameters – Support UM DRB with 12-bit length RLC SN | Indicates whether the UE supports UM DRB with 12-bit length of RLC sequence number for sidelink |  | *um-WithLongSN-Sidelink-r16* | *RLC-ParametersSidelink-r16* | No | No |  | Optional with capability signaling |
| 13-5 | Sidelink MAC parameters - selection of logical channels for each SL grant based on RRC configured restriction | Indicates whether UE supports the selection of logical channels for each SL grant based on RRC configured restriction |  | *lcp-RestrictionSidelink-r16* | *MAC-ParametersSidelinkCommon-r16* | No | No |  | Optional with capability signaling |
| 13-6 | Sidelink MAC parameters – support of *logicalChannelSR-DelayTimer* | Indicates whether the UE supports the *logicalChannelSR-DelayTimer* as specified in TS 38.321 [xx] for sidelink logical channel(s). |  | *logicalChannelSR-DelayTimerSidelink-r16* | *MAC-ParametersSidelinkXDD-Diff-r16* | Yes | No |  | Optional with capability signaling |
| 13-7 | Sidelink MAC parameters – 8 SR configurations per PUCCH cell group | Indicates whether the UE supports 8 SR configurations per PUCCH cell group as specified in TS 38.321 [xx] for sidelink. |  | *multipleSR-ConfigurationsSidelink-r16* | *MAC-ParametersSidelinkXDD-Diff-r16* | Yes | No |  | Optional with capability signaling |
| 13-8 | Sidelink MAC parameters - 8 sidelink configured grant configurations | Indicates whether UE supports 8 sidelink configured grant configurations (including both Type 1 and Type 2) in a resource pool. |  | *multipleConfiguredGrantsSidelink-r16* | *MAC-ParametersSidelinkCommon-r16* | No | No | If absent, for each resource pool, the UE only supports one sidelink configured grant configuration. | Optional with capability signaling |
|  |  |  |  |  |  |  |  |  |  |

Annex-14: RACS-RAN-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 14. RACS-RAN-Core | 14-1 | Segmentation for UE capability information | Support segmentation of *UECapabilityInformation* as specified in TS 38.331 [x]. |  |  |  | N/A | N/A |  | Optional without capability signalling |
|  |  |  |  |  |  |  |  |  |  |

Annex-15: NR\_IIOT-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 5. NR\_IIOT-Core | 15-1 | Reference time provisioning | Indicates whether the UE supports provision of referenceTimeInfo in *DLInformationTransfer* message and in SIB9 and reference time information preference indication via assistance information, as specified in TS 38.331 [x]. |  | *referenceTimeProvision-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
| 15-2 | LCP restriction enhancements | 1) Indicates whether the UE supports restricting data transmission from a given LCH to a configured (sub-) set of configured grant configurations (see *allowedCG-List-r16* in *LogicalChannelConfig* in TS 38.331 [x]) as specified in TS 38.321 [xx].  2) Indicates whether the UE supports restricting data transmission from a given LCH to a configured (sub-) set of dynamic grant priority levels (see *allowedPHY-PriorityIndex-r16* in *LogicalChannelConfig* in TS 38.331 [x]) as specified in TS 38.321 [xx]. |  | 1) *lch-ToConfiguredGrantMapping-r16*  2) *lch-ToGrantPriorityRestriction-r16* | *MAC-ParametersCommon* | No | No |  | Optional with capability signalling |
| 15-3 | Extended periodicities for CG | Indicates that the UE supports extended periodicities for CG Type 1 (if the UE indicates *configuredUL-GrantType1* capability) or CG Type 2 (if the UE indicates *configuredUL-GrantType2* capability) as specified by *periodicityExt-r16* field of IE *ConfiguredGrantConfig* in TS 38.331 [x]. |  | *extendedCG-Periodicities-r16* | *Phy-ParametersCommon* | No | No |  | Optional with capability signalling |
| 15-4 | Extended periodicities for SPS | Indicates that the UE supports extended periodicities for downlink SPS as specified by *periodicityExt-r16* field of IE *SPS-Config* in TS 38.331 [x]. |  | *extendedSPS-Periodicities-r16* | *Phy-ParametersCommon* | No | No |  | Optional with capability signalling |
| 15-5 | Ethernet header compression | 1) Indicates that the UE supports Ethernet header compression and decompression using EHC protocol, as specified in TS 38.323 [zz].  2) Indicates that the UE supports EHC context continuation operation where the UE keeps the established EHC context(s) upon PDCP re-establishment, as  specified in TS 38.323 [zz].  3) Indicates whether the UE supports simultaneous configuration of EHC and ROHC protocols for the same DRB.  4) Defines the maximum number of Ethernet header compression contexts supported by the UE across all DRBs and across UE's EHC compressor and EHC decompressor. The indicated number defines the number of contexts in addition to CID = "all zeros" as specified in TS 38.323 [zz]. |  | 1) *ehc-r16*  2) *continueEHC-Context-r16*  3) *jointEHC-ROHC-Config-r16*  4) *maxNumberEHC-Contexts-r16* | *PDCP-Parameters* | No | No | 1) The UE indicating this capability and indicating support for at least one ROHC profile, shall support simultaneous configuration of EHC and ROHC on different DRBs. | Optional with capability signalling |
| 15-6 | Intra-UE prioritization | 1) Indicates whether the UE supports prioritization between overlapping grants and between scheduling request and overlapping grants based on LCH priority as specified in TS 38.321 [xx].  2) Indicates whether the UE supports autonomous transmission of the MAC PDU generated for a deprioritized configured uplink grant as specified in TS 38.321 [xx]. | 2) *lch-priorityBasedPrioritization-r16* | 1) *lch-PriorityBasedPrioritization-r16*  2) *autonomousTransmission-r16* | *MAC-ParametersCommon* | No | No |  | Optional with capability signalling |
| 15-7 | PDCP duplication | Defines whether the UE supports PDCP duplication with more than two RLC entities as specified in TS 38.323 [zz]. | *pdcp-DuplicationMCG-OrSCG-DRB*, *pdcp-DuplicationSplitDRB*, *pdcp-DuplicationSplitSRB* and *pdcp-DuplicationSRB*. | *pdcp-DuplicationMoreThanTwoRLC-r16* | *PDCP-Parameters* | No | No | The UE supporting this feature supports secondary RLC entity(ies) activation and deactivation based on duplication RLC Activation/Deactivation MAC CE as specified in TS 38.321 [xx]. | Optional with capability signalling |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

# Annex-16: NR\_pos-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 37.355 [2] | Parent IE in TS 37.355 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 16. NR\_pos-Core | 16-1 | Additional paths reporting | Indicates whether the UE supports additional paths reporting for Multi-RTT or DL-TDOA |  | *additionalPathsReport-r16* | *NR-Multi-RTT-ProvideCapabilities-r16 or*  *NR-DL-TDOA-ProvideCapabilities-r16*  *LPP* | N/A | N/A |  | Optional with capability signalling |
| 16-2 | Periodical Reporting | Indicates whether the UE supports periodical Reporting for NR ECID, DL-AoD, Multi-RTT or DL-TDOA |  | *periodicalReporting-r16* | *NR-Multi-RTT-ProvideCapabilities-r16 or*  *NR-DL-TDOA-ProvideCapabilities-r16 or*  *NR-ECID-ProvideCapabilities-r16 or*  *NR-DL-AoD-ProvideCapabilities-r16*  *LPP* | N/A | N/A |  | Optional with capability signalling |
| 16-3 | Triggered Reporting | Indicates whether the UE supports triggered Reporting for NR ECID |  | *triggeredReporting-r16* | *NR-ECID-ProvideCapabilities-r16*  *LPP* | N/A | N/A |  | Optional with capability signalling |
| **16-4** | Positionig Modes for DL-TDOA | Indicates what positoining mode the UE supports for DL-TDOA. The positioning mode incldues standalone, ue-based, and ue-assisted |  | *nr-DL-TDOA-Mode-r16* | *NR-DL-TDOA-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
| **16-5** | Positioning Modes for DL-AoD | Indicates what positoining mode the UE supports for DL-TDOA. The positioning mode incldues standalone, ue-based, and ue-assisted |  | *nr-DL-AoD-Mode-r16* | *NR-DL-AOD-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
| **16-6** | SSR URS | Indicates whether the UE support SSR URS |  | *gnss-SSR-URA-Support-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
| **16-7** | SSR Phase Bias | Indicates whether the UE support SSR Phase Bias |  | *gnss-SSR-PhaseBiasSupport-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-8** | SSR STEC Correction | Indicates whether the UE support SSR STEC Correction |  | *gnss-SSR-STEC-CorrectionSupport-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  | **16-9** | SSR Gridded Correction | Indicates whether the UE support SSR Gridded Correction |  | *gnss-SSR-GriddedCorrectionSupport-r16* | *A-GNSS-ProvideCapabilities* | N/A | N/A |  | Optional with capability signalling |
|  |  |  |  |  |  |  |  |  |  |  |

Annex-17: NR\_Mob\_enh-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 17. NR\_Mob\_enh-Core | 17-1 | CHO | Indicates whether the UE supports conditional handover between FDD and TDD cells. | The parameter can only be set if *condHandover-r16* is set for at least one FDD band and one TDD band. | *condHandoverFDD-TDD-r16* | *condHandoverParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 17-2 | CHO | Indicates whether the UE supports conditional handover HO between FR1 and FR2. | The parameter can only be set if *condHandover-r16* is set for at least one FR1 band and one FR2 band. | *condHandoverFR1-FR2-r16* | *condHandoverParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 17-3 | CHO | Indicates whether the UE supports conditional handover including execution condition, candidate cell configuration and maximum 8 candidate cells. |  | *condHandover-r16* | *BandNR* | N/A | N/A | UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Optional with capability signalling |
| 17-4 | CHO | Indicates whether the UE supports conditional handover during re-establishment procedure when the selected cell is configured as candidate cell for condition handover. |  | *condHandoverFailure-r16* | *BandNR* | N/A | N/A | UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Optional with capability signalling |
| 17-5 | CHO | Indicates whether the UE supports 2 trigger events for same execution condition. | 17-3 | *condHandoverTwoTriggerEvents-r16* | *BandNR* | N/A | N/A | UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Conditional mandatory with capability signalling |
| 17-6 | CPC | Indicates whether the UE supports conditional PSCell change between FDD and TDD cells. | The parameter can only be set if *condPSCellChange-r16* is set for at least one FDD band and one TDD band. | *condPSCellChangeFDD-TDD-r16* | *condPSCellChangeParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 17-7 | CPC | Indicates whether the UE supports conditional PSCell change between FR1 and FR2. | The parameter can only be set if *condPSCellChange-r16* is set for at least one FR1 band and one FR2 band. | *condPSCellChangeFR1-FR2-r16* | *condPSCellChangeParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 17-8 | CPC | Indicates whether the UE supports conditional PSCell change including execution condition, candidate cell configuration and maximum 8 candidate cells. |  | *condPSCellChange-r16* | *BandNR* | N/A | N/A | UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Optional with capability signalling |
| 17-9 | CPC | Indicates whether the UE supports 2 trigger events for same execution condition. | 17-8 | *condPSCellChangeTwoTriggerEvents-r16* | *BandNR* | N/A | N/A | UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Conditional mandatory with capability signalling |
| 17-10 | T312 for PCell | Indicates whether the UE supports T312 based fast failure recovery for PCell. |  | *pcellT312-r16* | *MeasAndMobParametersCommon* | No | No |  | Optional with capability signalling |
| 17-11 | T312 for PSCell | Indicates whether the UE supports T312 based fast failure recovery for PSCell. |  | *pscellT312-r16* | *MeasAndMobParametersMRDC-Common-v1610* | No | No |  | Optional with capability signalling |

Annex-18: LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 18. LTE\_NR\_DC\_CA\_enh-Core | 18-1 | Recovery from MCG RLF vis split SRB1 or SRB3 | Indicates whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported) as specified in TS 38.331[x]. |  | *mcgRLF-RecoveryViaSCG-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
| 18-2 | Resume with stored MCG SCell configuration | Indicates whether the UE supports not deleting the stored MCG SCell configuration when initiating the resume procedure. |  | *resumeWithStoredMCG-SCells-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
| 18-3 | Support of (re-)configuration of an SCG during resume | Indicates whether the UE supports (re-)configuration of an SCG during the resume procedure. |  | *resumeWithSCG-Config-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
| 18-4 | Resume with stored SCG configuration | Indicates whether the UE supports not deleting the stored SCG configuration when initiating resume. | 18-3 | *resumeWithStoredSCG-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
| 18-5 | Direct NR MCG SCell activation | 1) Indicates whether the UE supports direct NR MCG SCell activation, as specified in TS 38.321 [xx], upon SCell addition, upon reconfiguration with sync of the MCG, as specified in TS 38.331 [x].  2) Indicates whether the UE supports direct NR MCG SCell activation, as specified in TS 38.321 [xx], upon reception of an *RRCResume* message, as specified in TS 38.331 [x]. |  | 1) *directMCG-SCellActivation-r16*  2) *directMCG-SCellActivationResume-r16* | *MAC-ParametersFRX-Diff-r16* | No | Yes |  | Optional with capability signalling |
| 18-6 | Direct NR SCG SCell activation | 1) Indicates whether the UE supports direct NR SCG SCell activation, as specified in TS 38.321 [xx], upon SCell addition and upon reconfiguration with sync of the SCG, both performed via an *RRCReconfiguration* message received via SRB3 or contained in an *RRC(Connection)Reconfiguration* message received via SRB1, as specified in TS 38.331 [x] and TS 36.331 [yy].  2) Indicates whether the UE supports direct NR SCG SCell activation, as specified in TS 38.321 [xx]:  - upon reception of an *RRCReconfiguration* included in an *RRCConnectionResume* message, as specified in TS 38.331 [x] and TS 36.331 [yy], if the UE indicates support of *en-dc* and of *resumeWithSCG-Config-r16* as specified in TS 36.331 [yy],  - upon reception of an *RRCReconfiguration* included in an *RRCResume* message, as specified in TS 38.331 [x], if the UE indicates support of *nr-dc* and of *resumeWithSCG-Config-r16* as specified in TS 38.331 [x]. | 1) Support of EN-DC or NGEN-DC as specified in TS 36.331 [yy], or Support of *nr-dc* as specified in TS 38.331 [x].  2) Support of EN-DC or NGEN-DC, and *resumeWithSCG-Config-r16* as specified in TS 36.331 [yy], or Support of *nr-dc* and *18-3* | 1) *directSCG-SCellActivation-r16*  2) *directSCG-SCellActivationResume-r16* | *MAC-ParametersFRX-Diff-r16* | No | Yes |  | Optional with capability signalling |
| 18-7 | RRM during IDLE/INACTIVE – Support of NR SSB measurement and reporting upon network request | 1) Indicates whether the UE supports configuration of NR SSB measurements in RRC\_IDLE/RRC\_INACTIVE and reporting of the corresponding results upon network request as specified in TS 38.331 [x]. |  | *idleInactiveNR-MeasReport-r16* | *MeasAndMobParametersFRX-Diff* | No | Yes | 1) If this parameter is indicated for FR1 and FR2 differently, each indication corresponds to the frequency range of measured target cell. | Optional with capability signalling |
| 18-8 | RRM during IDLE/INACTIVE – Support of NR measurements and reporting upon network request | Indicates whether the UE supports configuration of a validity area for NR measurements in RRC\_IDLE/RRC\_INACTIVE as specified in TS 38.331 [x]. |  | *idleInactive-ValidityArea-r16* | *MeasAndMobParametersCommon* | No | No |  | Optional with capability signalling |
| 18-9 | RRM during IDLE/INACTIVE – Support of E-UTRA measurements and reporting upon network request | Indicates whether the UE supports configuration of E-UTRA measurements in RRC\_IDLE/RRC\_INACTIVE and reporting of the corresponding results upon network request as specified in TS 38.331 [x]. |  | *idleInactiveEUTRA-MeasReport-r16* | *MeasAndMobParametersCommon* | No | No |  | Optional with capability signalling |
| 18-10 | Async NR-DC UE capability | Indicates whether the UE supports asynchronous NR-DC with MRTD and MTTD as specified in clause 7.5 and 7.6 of TS 38.133 [5]. If the band combination is comprised of a single band entry for more than two carriers, the UE shall support any permutations of carriers to CGs. If the band combination is comprised of at least two band entries, the carriers corresponding to a band entry shall belong to only one cell group. |  | *asyncNRDC-r16* | *CA-ParametersNRDC-v1610* | No | No | A UE indicating this capability shall support asynchronous NR-DC configuration where all serving cells of the MCG are in FR1 and all serving cells of the SCG are in FR2. | FFS |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

# Annex-19: NR\_UE\_pow\_sav-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 19. NR\_UE\_pow\_sav-Core | 19-1 | UE assistance information for power saving – DRX preference | Indicates whether the UE supports providing its preference of a cell group on DRX parameters for power saving in RRC\_CONNECTED, as specified in TS 38.331 [x]. |  | *drx-Preference-r16* | *PowSav-ParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 19-2 | UE assistance information for power saving – Maximum aggregated bandwidth preference | Indicates whether the UE supports providing its preference of a cell group on the maximum aggregated bandwidth for power saving in RRC\_CONNECTED, as specified in TS 38.331 [x]. |  | *maxBW-Preference-r16* | *PowSav-ParametersFRX-Diff-r16* | No | Yes |  | Optional with capability signalling |
| 19-3 | UE assistance information for power saving – Maximum number of secondary component carrier preference | Indicates whether the UE supports providing its preference of a cell group on the maximum number of secondary component carriers for power saving in RRC\_CONNECTED, as specified in TS 38.331 [x]. |  | *maxCC-Preference-r16* | *PowSav-ParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 19-4 | UE assistance information for power saving – Maximum number of MIMO layers preference | Indicates whether the UE supports providing its preference of a cell group on the maximum number of MIMO layers for power saving in RRC\_CONNECTED, as specified in TS 38.331 [x]. |  | *maxMIMO-LayerPreference-r16* | *PowSav-ParametersFRX-Diff-r16* | No | Yes |  | Optional with capability signalling |
| 19-5 | UE assistance information for power saving – preference to transition out of RRC\_CONNECTED | Indicates whether the UE supports providing its preference assistance information to transition out of RRC\_CONNECTED for power saving, as specified in TS 38.331 [x]. |  | *releasePreference-r16* | *PowSav-ParametersCommon-r16* | No | No |  | Optional with capability signalling |
| 19-6 | Relaxed measurement | Indicates whether the UE supports relaxed RRM measurements of neighbour cells in RRC\_IDLE/RRC\_INACTIVE as specified in TS 38.304 [xxx]. |  | *N/A* | *N/A* | N/A | N/A |  | Optional without UE capability signalling |

Annex-20: NR\_SON\_MDT-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 20. NR\_SON\_MDT-Core | 20-1 | RACH reporting | Indicates whether the UE supports delivery of *rachReport* upon request from the network. |  | *rach-Report-r16* | *SON-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-2 | Measurement reporting – barometer measurement upon network request | Indicates whether UE supports uncompensated barometeric pressure measurement reporting upon request from the network. |  | *barometerMeasReport-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-3 | Immediate Measurement reporting – Bluetooth measurement | Indicates whether the UE supports Bluetooth measurements in RRC\_CONNECTED state. |  | *immMeasBT-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-4 | Immediate Measurement – WLAN measurement | Indicates whether the UE supports WLAN measurements in RRC\_CONNECTED state. |  | *immMeasWLAN-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-5 | Logged Measurement – Bluetooth measurement | Indicates whether the UE supports Bluetooth measurements in RRC\_IDLE and RRC\_INACTIVE state. |  | *loggedMeasBT-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-6 | Logged Measurement – UE support | Indicates whether the UE supports logged measurements in RRC\_IDLE and RRC\_INACTIVE. A UE that supports logged measurements shall support both periodical logging and event-triggered logging. The memory size of MDT logged measurements is 64KB. |  | *loggedMeasurements-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-7 | Logged Measurement – WLAN measurement | Indicates whether the UE supports WLAN measurements in RRC\_IDLE and RRC\_INACTIVE state. |  | *loggedMeasWLAN-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-8 | Measurement reporting – Orientation measurement upon network request | Indicates whether the UE supports orientation information reporting upon request from the network. |  | *orientationMeasReport-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-9 | Measurement reporting – Speed information upon network request | Indicates whether the UE supports speed information reporting upon request from the network. |  | *speedMeasReport-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-10 | Support of GNSS or A-GNSS to provide location information with SON and MDT related measurement | Indicates whether the UE is equipped with a GNSS or A-GNSS receiver that may be used to provide detailed location information along with SON or MDT related measurements in RRC\_CONNECTED, RRC\_IDLE and RRC\_INACTIVE. |  | *gnss-Location-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-11 | Support of UL PDCP Packet Average Delay measurement | Indicates whether the UE supports UL PDCP Packet Average Delay measurement (as specified in TS 38.314 [yyy]) and reporting in RRC\_CONNECTED state. |  | *ulPDCP-Delay-r16* | *UE-BasedPerfMeas-Parameters-r16* | No | No |  | Optional with capability signalling |
| 20-12 | Mobility history information storage | Indicate support of the storage of mobility history information and the reporting in *UEInformationResponse* message as specified in TS 38.331 [x]. |  | *N/A* | *N/A* | N/A | N/A |  | Optional without capability signalling |
| 20-13 | Cross RAT RLF Report | Indicates support of the delivery of EUTRA RLF report to an NR node upon request from the network. |  | *N/A* | *N/A* | N/A | N/A |  | Optional without capability signalling |
| 20-14 | Radio Link Failure Report for inter-RAT MRO EUTRA | Indicates whether the UE supports:  - Include EUTRA CGI and associated TAC, if available, and otherwise to include the physical cell identity and carrier frequency of the target PCell of the failed handover as *failedPCellId* in *RLF-Report* upon request from the network as specified in TS 38.331 [x].  - Include EUTRA CGI and associated TAC as *previousPCellId* in *RLF-Report* as specified in TS 38.331 [x].  - Include *eutraReconnectCellId* in *reconnectCellId* in the *RLF-Report* as specified in TS 38.331 [x] upon UE has radio link failure or handover failure and successfully re-connected to an E-UTRA cell. |  | *N/A* | *N/A* | N/A | N/A |  | Optional without capability signalling |

# Annex-21: NR\_L1enh\_URLLC-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 21. NR\_L1enh\_URLLC-Core | 21-1 | New values for PDCP discard timer | Indicates whether the UE supports the additional values of PDCP discard timer. The supported additional values are 0.5ms, 1ms, 2ms, 4ms, 6ms and 8ms, as specified in TS 38.331 [x]. |  | *extendedDiscardTimer-r16* | *PDCP-Parameters* | No | No |  | Optional with capability signalling |
| 21-2 | New values for RLC *T-PollRetransmit timer* | Indicates whether the UE supports the additional values of *T-PollRetransmit* timer. The supported additional values are 1ms, 2ms, 3ms and 4ms, as specified in TS 38.331 [x]. |  | *extendedT-PollRetransmit-r16* | *RLC-Parameters* | No | No |  | Optional with capability signalling |
| 21-3 | New values for RLC *T-StatusProhibit timer* | Indicates whether the UE supports the additional values of *T-StatusProhibit* timer. The supported additional values are 1ms, 2ms, 3ms and 4ms, as specified in TS 38.331 [x]. |  | *extendedT-StatusProhibit-r16* | *RLC-Parameters* | No | No |  | Optional with capability signalling |

Annex-22: SRVCC\_NR\_to\_UMTS-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 22. SRVCC\_NR\_to\_UMTS-Core | 22-1 | SRVCC to UMTS | 1) Indicates whether the UE supports NR to UTRA-FDD CELL\_DCH CS handover. It is mandatory to support both UTRA-FDD measurement and event B triggered reporting, and periodic UTRA-FDD measurement and reporting if the UE supports HO to UTRA-FDD. If this field is included, then UE shall support IMS voice over NR. |  | *handoverUTRA-FDD-r16* | *MeasAndMobParametersXDD-Diff, MeasAndMobParametersFRX-Diff* | Yes | Yes |  | Optional with capability signalling |
| 22-2 | SupportedBandList UTRA-FDD | Radio frequency bands defined in 4.5.7, TS 25.306 [x] |  | *supportedBandListUTRA-FDD-r16* | *UTRA-FDD-Parameters-r16* | No | N/A |  | Optional with capability signalling |

Annex-23. NG\_RAN\_PRN-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 23. NG\_RAN\_PRN-Core | 23-1 | CGI acquisition of NPN relevant CGI-information | Defines whether the UE supports acquisition of NPN-relevant CGI-information from a neighbouring intra-frequency or inter-frequency NR NPN cell by reading the SI of the neighbouring cell and reporting the acquired information to the network as specified in TS 38.331 [x]. |  | *nr-CGI-Reporting-NPN-r16* | *MeasAndMobParametersCommon* | No | No |  | Conditional mandatory with capability signalling  If UE supports NPN, UE shall support this feature. |
|  |  |  |  |  |  |  |  |  |  |

Annex-24: TEI16 and Others

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 [2] | Parent IE in TS 38.331 [2] | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| 24. TEI16/Others | 24-1 | Secondary DRX group | Indicates whether UE supports secondary DRX group as specified in TS 38.321 [xx]. |  | *secondaryDRX-Group-r16* | *MAC-ParametersXDD-Diff* | Yes | No |  | Optional with capability signalling |
| 24-2 | Increase number of CSI-RS resource | Indicates support of up to 192 CSI-RS resource for L3 mobility configuration per measurement object configured with *associatedSSB*. |  | *increasedNumberofCSIRSPerMO-r16* | *MeasAndMobParametersFRX-Diff* | No | Yes |  | Optional with capability signalling |
| 24-3 | Support of SMTC configuration of target SCG for PSCell addition and change | Indicates the support of configuration of SMTC of target SCG cell with field *targetCellSMTC-SCG*. |  | *targetSMTC-SCG-r16* | *Phy-ParametersCommon* | No | No |  | Optional with capability signalling |
| 24-4 | Support of on demand request procedure in RRC CONNECTED | Indicates whether the UE supports the on-demand request procedure of SIB(s) or posSIB(s) while in RRC\_CONNECTED, as specified in TS 38.331 [x]. |  | *onDemandSIB-Connected-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
| 24-5 | P bit in single entry PHR MAC CE | Indicates whether UE supports the P bit in single PHR MAC CE as specified in TS 38.321 [xx]. |  | *singlePHR-P-r16* | *MAC-ParametersCommon* | No | No |  | Optional with capability signalling |
| 24-6 | UE support of dynamic reporting of measurement gap requirement | Indicates whether the UE supports reporting the measurement gap requirement information for NR target in the UE response to a network configuration RRC message. |  | *nr-NeedForGap-Reporting-r16* | *MeasAndMobParametersCommon* | No | No |  | Optional with capability signalling |
| 24-7 | IDC | Indicates whether the UE supports IDC (In-Device Coexistence) assistance information as specified in TS 38.331 [x]. |  | *inDeviceCoexInd-r16* | *UE-NR-Capability-v1610* | No | No |  | Optional with capability signalling |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | 24-9 | Segmentation of DL RRC messages | Indicates whether the UE supports reception of segmented DL RRC messages. |  | dl-DedicatedMessageSegmentation-r16 | UE-NR-Capability-v1610 | No | No |  | Optional with capability signalling |
|  | 24-10 | Voice fallback to LTE EPC | Indicates whether the UE supports *voiceFallbackIndication* in *RRCRelease* and *MobilityFromNRCommand*. If this field is included, the UE shall support IMS voice over NR and IMS voice over E-UTRA via EPC. | *voiceOverNR* ***(0-5)*** | *voiceFallbackIndicationEPS-r16* | *IMS-ParametersCommon* | No | No |  | Optional with capability signalling |
|  | 24-11 | HO from NR to EN-DC | Indicates whether the UE supports inter-RAT handover from NR to EN-DC while NR-DC or NE-DC is not configured as defined in TS 36.306 [15]. It is mandated for UE support EN-DC. |  | *nr-HO-ToEN-DC-r16* | *EUTRA-ParametersCommon* | No | N/A |  | Conditional Mandatory with capability signalling for UE supporting EN-DC. |
|  | 24-12 | Periodic reporting of best neighouring cells | Defines whether the UE supports periodic reporting of best neighbour cells per serving frequency, as defined in TS 38.331 [x]. |  | *reportAddNeighMeasForPeriodic-r16* | *MeasAndMobParametersCommon* | No | No |  | Mandatory with capability signalling |
|  | 24-13 | Releasing SUL configuration |  |  |  |  | N/A | N/A |  | Mandatory without capability signalling |
|  | 24-14 | Bit rate multiplier for recommended bit rate MAC CE | Indicates whether the UE supports the bit rate multiplier for recommended bit rate MAC CE as specified in TS 38.321 [xx], clause 6.1.3.20. | *R2 3-7* | *recommendedBitRateMultiplier-r16* | *MAC-ParametersCommon* | No | No |  | Optional with capability signalling |
|  | 24-15 | Introduction of a second SMTC per frequency carrier in idle/inactive (smtc2-LP-r16 in SIB2/SIB4) | Introduction of a second SMTC (*smtc2-LP-r16*) per frequency carrier in idle/inactive in SIB2/SIB4 |  |  |  | N/A | N/A |  | Mandatory without capability signalling |
|  | 24-16 | Introduction of PRACH prioritization parameters for MPS and MCS in RACH-ConfigCommon | Introduction of PRACH prioritization parameters for MPS and MCS in RACH-ConfigCommon |  |  |  | N/A | N/A |  | Mandatory without capability signalling |