**3GPP TSG-RAN WG2 Meeting #116bis-e *R2-220xxxx***

**Electronic meeting, January 17 – 25, 2022**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **-** | **rev** | **-** | **Current version:** | **16.7.0** |  |
|  |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **X** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Running CR to 38331 on UE capability for 71G |
|  |  |
| ***Source to WG:*** | Intel Corporation |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_ext\_to\_71GHz-Core |  | ***Date:*** | 2022-01-11 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Introduce UE Capabilities for NR operation up to 71G |
|  |  |
| ***Summary of change:*** | Introduce UE Capabilities for NR operation up to 71G:* Include the FR2-1 and FR2-2 differentiation to existing RAN2 determined UE capabilities
 |
|  |  |
| ***Consequences if not approved:*** | UE capabilities required by FR2-2 are not introduced |
|  |  |
| ***Clauses affected:*** | 6.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 38.306 CR XXX |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

START OF FIRST CHANGE

### 6.3.3 UE capability information elements

**<< OMMITED>>**

– *IMS-Parameters*

The IE *IMS-Parameters* is used to convey capabilities related to IMS.

***IMS-Parameters* information element**

-- ASN1START

-- TAG-IMS-PARAMETERS-START

IMS-Parameters ::= SEQUENCE {

 ims-ParametersCommon IMS-ParametersCommon OPTIONAL,

 ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL,

 ...

}

IMS-Parameters-v17xx ::= SEQUENCE {

 ims-ParametersFR2-2-r17 IMS-ParametersFR2-2-r17 OPTIONAL,

}

IMS-ParametersCommon ::= SEQUENCE {

 voiceOverEUTRA-5GC ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 voiceOverSCG-BearerEUTRA-5GC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 voiceFallbackIndicationEPS-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

IMS-ParametersFRX-Diff ::= SEQUENCE {

 voiceOverNR ENUMERATED {supported} OPTIONAL,

 ...

}

IMS-ParametersFR2-2-r17 ::= SEQUENCE {

voiceOverNR-r17 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-IMS-PARAMETERS-STOP

-- ASN1STOP

**<< OMMITED>>**

– *MAC-Parameters*

The IE *MAC-Parameters* is used to convey capabilities related to MAC.

***MAC-Parameters* information element**

-- ASN1START

-- TAG-MAC-PARAMETERS-START

MAC-Parameters ::= SEQUENCE {

 mac-ParametersCommon MAC-ParametersCommon OPTIONAL,

 mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL

}

MAC-Parameters-v1610 ::= SEQUENCE {

 mac-ParametersFRX-Diff-r16 MAC-ParametersFRX-Diff-r16 OPTIONAL

}

MAC-Parameters-v17xx ::= SEQUENCE {

 mac-ParametersFR2-2-r17 MAC-ParametersFR2-2-r17 OPTIONAL

}

MAC-ParametersCommon ::= SEQUENCE {

 lcp-Restriction ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 lch-ToSCellRestriction ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 recommendedBitRate ENUMERATED {supported} OPTIONAL,

 recommendedBitRateQuery ENUMERATED {supported} OPTIONAL

 ]],

 [[

 recommendedBitRateMultiplier-r16 ENUMERATED {supported} OPTIONAL,

 preEmptiveBSR-r16 ENUMERATED {supported} OPTIONAL,

 autonomousTransmission-r16 ENUMERATED {supported} OPTIONAL,

 lch-PriorityBasedPrioritization-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToConfiguredGrantMapping-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToGrantPriorityRestriction-r16 ENUMERATED {supported} OPTIONAL,

 singlePHR-P-r16 ENUMERATED {supported} OPTIONAL,

 ul-LBT-FailureDetectionRecovery-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 8-1: MPE

 tdd-MPE-P-MPR-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 lcid-ExtensionIAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 spCell-BFR-CBRA-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 srs-ResourceId-Ext-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

MAC-ParametersFRX-Diff-r16 ::= SEQUENCE {

 directMCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

 directMCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-1: DRX Adaptation

 drx-Adaptation-r16 SEQUENCE {

 non-SharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL,

 sharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL

 } OPTIONAL,

 ...

}

MAC-ParametersFR2-2-r17 ::= SEQUENCE {

 directMCG-SCellActivation-r17 ENUMERATED {supported} OPTIONAL,

 directMCG-SCellActivationResume-r17 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivation-r17 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivationResume-r17 ENUMERATED {supported} OPTIONAL,

 ...

}

MAC-ParametersXDD-Diff ::= SEQUENCE {

 skipUplinkTxDynamic ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimer ENUMERATED {supported} OPTIONAL,

 longDRX-Cycle ENUMERATED {supported} OPTIONAL,

 shortDRX-Cycle ENUMERATED {supported} OPTIONAL,

 multipleSR-Configurations ENUMERATED {supported} OPTIONAL,

 multipleConfiguredGrants ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 secondaryDRX-Group-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 enhancedSkipUplinkTxDynamic-r16 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxConfigured-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

MinTimeGap-r16 ::= SEQUENCE {

 scs-15kHz-r16 ENUMERATED {sl1, sl3} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {sl1, sl6} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {sl1, sl12} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {sl2, sl24} OPTIONAL

}

-- TAG-MAC-PARAMETERS-STOP

-- ASN1STOP

– *MeasAndMobParameters*

The IE *MeasAndMobParameters* is used to convey UE capabilities related to measurements for radio resource management (RRM), radio link monitoring (RLM) and mobility (e.g. handover).

***MeasAndMobParameters* information element**

-- ASN1START

-- TAG-MEASANDMOBPARAMETERS-START

MeasAndMobParameters ::= SEQUENCE {

 measAndMobParametersCommon MeasAndMobParametersCommon OPTIONAL,

 measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL,

 measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

MeasAndMobParameters-v17xx ::= SEQUENCE {

 measAndMobParametersFR2-2-r17 MeasAndMobParametersFR2-2-r17 OPTIONAL

}

MeasAndMobParametersCommon ::= SEQUENCE {

 supportedGapPattern BIT STRING (SIZE (22)) OPTIONAL,

 ssb-RLM ENUMERATED {supported} OPTIONAL,

 ssb-AndCSI-RS-RLM ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 eventB-MeasAndReport ENUMERATED {supported} OPTIONAL,

 handoverFDD-TDD ENUMERATED {supported} OPTIONAL,

 eutra-CGI-Reporting ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting ENUMERATED {supported} OPTIONAL

 ]],

 [[

 independentGapConfig ENUMERATED {supported} OPTIONAL,

 periodicEUTRA-MeasAndReport ENUMERATED {supported} OPTIONAL,

 handoverFR1-FR2 ENUMERATED {supported} OPTIONAL,

 maxNumberCSI-RS-RRM-RS-SINR ENUMERATED {n4, n8, n16, n32, n64, n96} OPTIONAL

 ]],

 [[

 nr-CGI-Reporting-ENDC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 eutra-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

 eutra-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 reportAddNeighMeasForPeriodic-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverParametersCommon-r16 SEQUENCE {

 condHandoverFDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverFR1-FR2-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 nr-NeedForGap-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 supportedGapPattern-NRonly-r16 BIT STRING (SIZE (10)) OPTIONAL,

 supportedGapPattern-NRonly-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 maxNumberCLI-RSSI-r16 ENUMERATED {n8, n16, n32, n64} OPTIONAL,

 maxNumberCLI-SRS-RSRP-r16 ENUMERATED {n4, n8, n16, n32} OPTIONAL,

 maxNumberPerSlotCLI-SRS-RSRP-r16 ENUMERATED {n2, n4, n8} OPTIONAL,

 mfbi-IAB-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NPN-r16 ENUMERATED {supported} OPTIONAL,

 idleInactiveEUTRA-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

 idleInactive-ValidityArea-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

 pcellT312-r16 ENUMERATED {supported} OPTIONAL,

 supportedGapPattern-r16 BIT STRING (SIZE (2)) OPTIONAL

 ]],

 [[

handoverFR1-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

handoverFR2-1-FR2-2-r17 ENUMERATED {supported} OPTIONAL

]]

}

MeasAndMobParametersXDD-Diff ::= SEQUENCE {

 intraAndInterF-MeasAndReport ENUMERATED {supported} OPTIONAL,

 eventA-MeasAndReport ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 handoverInterF ENUMERATED {supported} OPTIONAL,

 handoverLTE-EPC ENUMERATED {supported} OPTIONAL,

 handoverLTE-5GC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sftd-MeasNR-Neigh ENUMERATED {supported} OPTIONAL,

 sftd-MeasNR-Neigh-DRX ENUMERATED {supported} OPTIONAL

 ]],

 [[

 dummy ENUMERATED {supported} OPTIONAL

 ]]

}

MeasAndMobParametersFRX-Diff ::= SEQUENCE {

 ss-SINR-Meas ENUMERATED {supported} OPTIONAL,

 csi-RSRP-AndRSRQ-MeasWithSSB ENUMERATED {supported} OPTIONAL,

 csi-RSRP-AndRSRQ-MeasWithoutSSB ENUMERATED {supported} OPTIONAL,

 csi-SINR-Meas ENUMERATED {supported} OPTIONAL,

 csi-RS-RLM ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 handoverInterF ENUMERATED {supported} OPTIONAL,

 handoverLTE-EPC ENUMERATED {supported} OPTIONAL,

 handoverLTE-5GC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 maxNumberResource-CSI-RS-RLM ENUMERATED {n2, n4, n6, n8} OPTIONAL

 ]],

 [[

 simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

 ]],

 [[

 nr-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

 nr-AutonomousGaps-ENDC-r16 ENUMERATED {supported} OPTIONAL,

 nr-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 nr-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 cli-RSSI-Meas-r16 ENUMERATED {supported} OPTIONAL,

 cli-SRS-RSRP-Meas-r16 ENUMERATED {supported} OPTIONAL,

 interFrequencyMeas-NoGap-r16 ENUMERATED {supported} OPTIONAL,

 simultaneousRxDataSSB-DiffNumerology-Inter-r16 ENUMERATED {supported} OPTIONAL,

 idleInactiveNR-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 6-2: Support of beam level Early Measurement Reporting

 idleInactiveNR-MeasBeamReport-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 increasedNumberofCSIRSPerMO-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

MeasAndMobParametersFR2-2-r17 ::= SEQUENCE {

 handoverInterF-r17 ENUMERATED {supported} OPTIONAL,

 handoverLTE-EPC-r17 ENUMERATED {supported} OPTIONAL,

handoverLTE-5GC-r17 ENUMERATED {supported} OPTIONAL,

idleInactiveNR-MeasReport ENUMERATED {supported} OPTIONAL,...

}

-- TAG-MEASANDMOBPARAMETERS-STOP

-- ASN1STOP

**<< OMMITED>>**

*– PowSav-Parameters*

The IE *PowSav-Parameters* is used to convey the capabilities supported by the UE for the power saving preferences.

***PowSav-Parameters* information element**

-- ASN1START

-- TAG-POWSAV-PARAMETERS-START

PowSav-Parameters-r16 ::= SEQUENCE {

 powSav-ParametersCommon-r16 PowSav-ParametersCommon-r16 OPTIONAL,

 powSav-ParametersFRX-Diff-r16 PowSav-ParametersFRX-Diff-r16 OPTIONAL,

 ...

}

PowSav-Parameters-v17xx ::= SEQUENCE {

 powSav-ParametersFR2-2-r17 PowSav-ParametersFR2-2-r17 OPTIONAL,

}

PowSav-ParametersCommon-r16 ::= SEQUENCE {

 drx-Preference-r16 ENUMERATED {supported} OPTIONAL,

 maxCC-Preference-r16 ENUMERATED {supported} OPTIONAL,

 releasePreference-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-4a: UE assistance information

 minSchedulingOffsetPreference-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

PowSav-ParametersFRX-Diff-r16 ::= SEQUENCE {

 maxBW-Preference-r16 ENUMERATED {supported} OPTIONAL,

 maxMIMO-LayerPreference-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

PowSav-ParametersFR2-2-r17 ::= SEQUENCE {

 maxBW-Preference-r17 ENUMERATED {supported} OPTIONAL,

 maxMIMO-LayerPreference-r17 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-POWSAV-PARAMETERS-STOP

-- ASN1STOP

**<< OMMITED>>**

– *UE-NR-Capability*

The IE *UE-NR-Capability* is used to convey the NR UE Radio Access Capability Parameters, see TS 38.306 [26].

***UE-NR-Capability* information element**

-- ASN1START

-- TAG-UE-NR-CAPABILITY-START

UE-NR-Capability ::= SEQUENCE {

 accessStratumRelease AccessStratumRelease,

 pdcp-Parameters PDCP-Parameters,

 rlc-Parameters RLC-Parameters OPTIONAL,

 mac-Parameters MAC-Parameters OPTIONAL,

 phy-Parameters Phy-Parameters,

 rf-Parameters RF-Parameters,

 measAndMobParameters MeasAndMobParameters OPTIONAL,

 fdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

 tdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

 fr1-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 featureSets FeatureSets OPTIONAL,

 featureSetCombinations SEQUENCE (SIZE (1..maxFeatureSetCombinations)) OF FeatureSetCombination OPTIONAL,

 lateNonCriticalExtension OCTET STRING (CONTAINING UE-NR-Capability-v15c0) OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1530 OPTIONAL

}

-- Regular non-critical extensions:

UE-NR-Capability-v1530 ::= SEQUENCE {

 fdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

 tdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 interRAT-Parameters InterRAT-Parameters OPTIONAL,

 inactiveState ENUMERATED {supported} OPTIONAL,

 delayBudgetReporting ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1540 OPTIONAL

}

UE-NR-Capability-v1540 ::= SEQUENCE {

 sdap-Parameters SDAP-Parameters OPTIONAL,

 overheatingInd ENUMERATED {supported} OPTIONAL,

 ims-Parameters IMS-Parameters OPTIONAL,

 fr1-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

 fr2-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

 fr1-fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1550 OPTIONAL

}

UE-NR-Capability-v1550 ::= SEQUENCE {

 reducedCP-Latency ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1560 OPTIONAL

}

UE-NR-Capability-v1560 ::= SEQUENCE {

 nrdc-Parameters NRDC-Parameters OPTIONAL,

 receivedFilters OCTET STRING (CONTAINING UECapabilityEnquiry-v1560-IEs) OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1570 OPTIONAL

}

UE-NR-Capability-v1570 ::= SEQUENCE {

 nrdc-Parameters-v1570 NRDC-Parameters-v1570 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1610 OPTIONAL

}

-- Late non-critical extensions:

UE-NR-Capability-v15c0 ::= SEQUENCE {

 nrdc-Parameters-v15c0 NRDC-Parameters-v15c0 OPTIONAL,

 partialFR2-FallbackRX-Req ENUMERATED {true} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v15g0 OPTIONAL

}

UE-NR-Capability-v15g0 ::= SEQUENCE {

 rf-Parameters-v15g0 RF-Parameters-v15g0 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non-critical extensions:

UE-NR-Capability-v1610 ::= SEQUENCE {

 inDeviceCoexInd-r16 ENUMERATED {supported} OPTIONAL,

 dl-DedicatedMessageSegmentation-r16 ENUMERATED {supported} OPTIONAL,

 nrdc-Parameters-v1610 NRDC-Parameters-v1610 OPTIONAL,

 powSav-Parameters-r16 PowSav-Parameters-r16 OPTIONAL,

 fr1-Add-UE-NR-Capabilities-v1610 UE-NR-CapabilityAddFRX-Mode-v1610 OPTIONAL,

 fr2-Add-UE-NR-Capabilities-v1610 UE-NR-CapabilityAddFRX-Mode-v1610 OPTIONAL,

 bh-RLF-Indication-r16 ENUMERATED {supported} OPTIONAL,

 directSN-AdditionFirstRRC-IAB-r16 ENUMERATED {supported} OPTIONAL,

 bap-Parameters-r16 BAP-Parameters-r16 OPTIONAL,

 referenceTimeProvision-r16 ENUMERATED {supported} OPTIONAL,

 sidelinkParameters-r16 SidelinkParameters-r16 OPTIONAL,

 highSpeedParameters-r16 HighSpeedParameters-r16 OPTIONAL,

 mac-Parameters-v1610 MAC-Parameters-v1610 OPTIONAL,

 mcgRLF-RecoveryViaSCG-r16 ENUMERATED {supported} OPTIONAL,

 resumeWithStoredMCG-SCells-r16 ENUMERATED {supported} OPTIONAL,

 resumeWithStoredSCG-r16 ENUMERATED {supported} OPTIONAL,

 resumeWithSCG-Config-r16 ENUMERATED {supported} OPTIONAL,

 ue-BasedPerfMeas-Parameters-r16 UE-BasedPerfMeas-Parameters-r16 OPTIONAL,

 son-Parameters-r16 SON-Parameters-r16 OPTIONAL,

 onDemandSIB-Connected-r16 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1640 OPTIONAL

}

UE-NR-Capability-v1640 ::= SEQUENCE {

 redirectAtResumeByNAS-r16 ENUMERATED {supported} OPTIONAL,

 phy-ParametersSharedSpectrumChAccess-r16 Phy-ParametersSharedSpectrumChAccess-r16 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1650 OPTIONAL

}

UE-NR-Capability-v1650 ::= SEQUENCE {

 mpsPriorityIndication-r16 ENUMERATED {supported} OPTIONAL,

 highSpeedParameters-v1650 HighSpeedParameters-v1650 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v17xx OPTIONAL

}

UE-NR-Capability-v17xx ::= SEQUENCE {

 powSav-Parameters-v17xx PowSav-Parameters-v17xx OPTIONAL,

mac-Parameters-v17xx MAC-Parameters-v17xx OPTIONAL,

ims-Parameters-v17xx IMS-Parameters-v17xx OPTIONAL,

measAndMobParameters-v17xx MeasAndMobParameters-v17xx OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode ::= SEQUENCE {

 phy-ParametersXDD-Diff Phy-ParametersXDD-Diff OPTIONAL,

 mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL,

 measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode-v1530 ::= SEQUENCE {

 eutra-ParametersXDD-Diff EUTRA-ParametersXDD-Diff

}

UE-NR-CapabilityAddFRX-Mode ::= SEQUENCE {

 phy-ParametersFRX-Diff Phy-ParametersFRX-Diff OPTIONAL,

 measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1540 ::= SEQUENCE {

 ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1610 ::= SEQUENCE {

 powSav-ParametersFRX-Diff-r16 PowSav-ParametersFRX-Diff-r16 OPTIONAL,

 mac-ParametersFRX-Diff-r16 MAC-ParametersFRX-Diff-r16 OPTIONAL

}

BAP-Parameters-r16 ::= SEQUENCE {

 flowControlBH-RLC-ChannelBased-r16 ENUMERATED {supported} OPTIONAL,

 flowControlRouting-ID-Based-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-NR-CAPABILITY-STOP

-- ASN1STOP

|  |
| --- |
| ***UE-NR-Capability* field descriptions** |
| ***featureSetCombinations***A list of *FeatureSetCombination:s* for *supportedBandCombinationList* in *UE-NR-Capability*. The *FeatureSetDownlink:s* and *FeatureSetUplink:s* referred to from these *FeatureSetCombination:s* are defined in the *featureSets* list in *UE-NR-Capability*. |

|  |
| --- |
| ***UE-NR-Capability-v1540 field descriptions*** |
| ***fr1-fr2-Add-UE-NR-Capabilities***This instance of *UE-NR-CapabilityAddFRX-Mode* does not include any other fields than *csi-RS-IM-ReceptionForFeedback*/ *csi-RS-ProcFrameworkForSRS*/ *csi-ReportFramework*. |

**<< OMMITED>>**

END OF CHANGE

# Annex: RAN2 Agreements

## RAN2#116bis-e

* 3: RAN2 confirm the baseline RLC RTT values for 480kHz and 960kHz to be 20ms. There is no need to further discuss this in RAN2.
* 1: Following two general options can be considered for LBT failure counting and indication (from PHY to MAC) for the case of independent per-beam LBT sensing.
* o Option 1: LBT failures are counted and indicated to MAC independently per beam
* o Option 2: LBT failures are counted and indicated to MAC per UL transmission, i.e. no beam indication included
* 2: For Option 2, i.e. LBT failures are counted and indicated to MAC per UL transmission, current Rel-16 LBT procedures can be baseline (i.e. no changes to the LBT failure detection and recovery procedure unless needed)
* 3: For Option 1, i.e. LBT failures are counted and indicated to MAC independently per beam, further changes/enhancements to the Rel-16 LBT procedures are required, i.e. LBT failure detection and recovery procedure.
* 6: “no-LBT mode” is already implicitly supported by Rel-16 specifications. FFS if additional differentiation from licensed operation in specification is required for some cases.
* 7: cg-RetransmissionTimer is optional for operation in the shared spectrum in FR2-2.
* 8: RAN2 assumes that no protocol changes are required in order to support LBT mode change.
* 4: From RAN2 point of view there is no need that PHY provides per-beam LBT failure indications to MAC in Rel-17. No need to send LS to RAN1 unless they request RAN2 view.
* A1: RAN2 does not agree to using the spare bit in MIB for the signaling of FR2-2 QCL assumptions for SSB. Respond to RAN1 LS accordingly.
* A2: The legacy MIB is used for FR2-2 (i.e. we do not define new MIB for FR2-2).
* A3: Up to RAN1 how to resolve QCL configuration (no suggestions from RAN2). This need not be included in LS to RAN1.
* A4: channelAccessMode2 is signaled as ENUMERATED {enabled}. This implies that the UE can not distinguish between licensed spectrum and shared spectrum without LBT. If RAN1 indicates there is need to distinguish these, we can revisit this agreement.
* B1: Add text with the new SCS values in the field description of the parameters listed in Table 1 in [R2-2201033](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201033.zip)
* C1: The parameter enableTimeDomainHARQ-BundlingType1-r17 is introduced in ServingCellConfig with the value “ENUMERATED {enabled}”. FFS if the name can be shortened.
* C2: maxNrofMultiplePDSCHs-r17 is defined in pdsch-TimeDomainAllocationListForMultiPDSCH-r17 with the value 8.
* C3: No restrictions are captured in RRC for pdsch-TimeDomainAllocationListForMultiPDSCH.
* C4: The following are agreed for signaling of PDSCH TDRA:

• The new PDSCH-TimeDomainResourceAllocation-r17 IE can be configured with either PDSCH repetition or multiple PDSCH.

• Introduce the field pdsch-TimeDomainAllocationListDCI-1-2-r17 and the field pdsch-TimeDomainAllocationList-r17 so that PDSCH repetitions can be used with the new k0 value range.

* C5: Introduce the field pusch-TimeDomainAllocationListDCI-1-2-r17 and the field pusch-TimeDomainAllocationList-r17 so that PUSCH repetition can be used with the new k2 value range.
* C6: The IE pusch-TimeDomainAllocationListForMultiPUSCH-r17 is configured with up to 16 list elements.
* C8: New Rel-17 IEs for UL-AccessConfigListDCI-0-1 and UL-AccessConfigListDCI-1-1 are introduced. This does not follow the RAN1 agreement to re-use Rel-16 versions and thus may need to be confirmed by RAN1.
* C7: k2(n) should always be signaled by the network. If RAN1 indicates there is a reason to specify the absence case, we can revisit this.
* D1: A new parameter ra-ResponseWindow-r17 with the value ENUMERATED {sl240, sl320, sl640, sl960, sl1280, sl1920, sl2560} is introduced for 4-step RACH for operation in FR2-2 shared spectrum.
* D2: A new parameter msgB-ResponseWindow-r17 with the value ENUMERATED {sl640, sl960, sl1280, sl1920, sl2560} is introduced for 2-step RACH for operation in FR2-2.
* Proposal E1: New values, e.g. 0.0313ms, 0.0156ms, 0.01ms, are added to maxPUSCH-Duration for FR2-2.
* Proposal E2: New values are added to IEs in UAI power saving and overheating parameters to reflect the new SCS, K0/K2, and bandwidth sizes for FR2-2.
* Proposal E3: cg-RetransmissionTimer is optionally configured for operation in FR2-2 shared spectrum.
* Proposal E4: New periodicity and offset values corresponding to the existing absolute periodicity and offset are introduced for Configured Grant in FR2-2. FFS if we introduce new absolute values
* Proposal E5: New periodicity and offset values corresponding to the existing absolute periodicity and offset are introduced for Scheduling Request in FR2-2. FFS if we introduce new absolute values
* Proposal E6: New periodicity values corresponding to the existing absolute periodicities are introduced for SPS in FR2-2.
* E7: Secondary DRX group is supported for FR1/FR2-2 CA. FFS if any new texts in the specifications are necessary.
* FFS if we introduce any new DRX timer values. Can rediscuss this in February if there is sufficient support.

## RAN2#116-e

* #1: The below Rel-15 and Rel-16 UE capabilities will be differentiated for FR2-1 and FR2-2:

Rel-16 Power saving: maxBW-Preference-r16, maxMIMO-LayerPreference-r16

Rel-16 DCCA: directMCG-SCellActivation-r16, directMCG-SCellActivationResume-r16, directSCG-SCellActivation-r16, directSCG-SCellActivationResume-r16, idleInactiveNR-MeasReport-r16

Rel-15 IMS voice: voiceOverNR, handoverLTE-5GC, handoverInterF, handoverLTE-EPC

* FFS if any other UE capabilities will be needed
* #2: For an existing capability that required further FR2-1 and FR2-2 differentiation, a new IE specifically for FR2-2 (xxParametersFR2-2) is included in the existing per UE IE (XXParameters) as shown in [R2-2109883](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_116-e/Docs/R2-2109883.zip), where xx/XX can be mac-/MAC-, phy-/PHY-, measAndMob/MeasAndMob, ims-/IMS- and powSav-/PowSav- associated with per UE capabilities.
* For a new Rel-17 capability, align with the general decision for Rel-17 capabilities (see main session discussion, FFS whether we align new capabilities with above decision for existing capabilities or have per-band capabilities instead)
* #3: For inter-frequency handover between FR1 and FR2-2 and between FR2-1 and FR2-2, additional per UE capabilities (mandatory with UE capability) below may need to be introduced if handoverInterF requires further FR2-1 and FR2-2 differentiation: handoverFR1-FR2-2-r17, handoverFR2-1-FR2-2-r17
* #4: If a new UE capability introduced for FR2-2 is also applicable to FR2-1 and/or FR1 and the UE capability is per band, this can be expressed in the field description of the UE capability as “This capability is also applicable to FR1 and FR2-1”.
* #5: For UE capability that has to be per UE, “FR1-FR2 Diff” column can be used to express the need of the FR2-1 and FR2-2 differentiation by adding ‘(include FR2-2)’ on top of ‘Yes’ or ‘FR2 only’
* Can revisit these if practical problems are found

RLC impacts

*Proposal#1: Introduce the RLC RTT vales for SCS480kHz and 960kHz as 20ms and captured in the table:*

- Ericsson thinks this is not yet concluded in RAN1. Suggest to use "baseline". Lenovo supports.

- LGE thinks RAN1 thinks 120 kHz is the baseline and prefers Intel proposal. vivo thinks P1 but ould need RLC running CR.- Samsung and Huawei agree.

* #1: Introduce the RLC RTT vales for SCS480kHz and 960kHz as 20ms as baseline. This will be part of TS38.306. Can include this in the running CR for 38.306.

MAC impacts

* #4: RA-RNTI/MsgB-RNTI issue for 480kHz SCS and 960kHz SCS can wait further for RAN1 conclusion.
* 1: RAN2 to keep the current DRX timer values for now, but it can be revisited for performance optimization after high priority issues are resolved.

L2 buffer size

* #2: Keep the L2 buffer size definition as it reflects the upper bound of the L2 buffer size requirement.
* #3: FFS whether UE capability is needed to address concern on too high L2 buffer size requirement. Companies should bring analysis on this to next meeting.

PDCP impacts (Ericsson)

* 2 The existing PDCP SN space is sufficient to cope with the extreme cases in 71 GHz, therefore no spec changes are foreseen for the existing PDCP SN space.

## RAN2#115-e

* 1: Wait for RAN1 to progress on the calculation of RA-RNTI/MsgB-RNTI issue
* 6: Depending on whether RAN1 introduces new SCS for data channels, RAN2 will capture the RLC RTT vales for SCS480kHz and 960kHz in the TS38.306 table on RLC RTT for NR cell group per SCS. FFS on the values (wait for RAN1 progress on L1 processing latency)

No FRx diff

* 2: An existing UE capability applicable to FR2 is also applicable to FR2-2, unless otherwise stated (i.e. in the field description of the UE capability that it is not applicable to FR2-2) in TS38.306,
* 3: If a new UE capability introduced for FR2-2 is also applicable to FR2-1 and/or FR1 and the UE capability is per band, this can be expressed in the field description of the UE capability.

FRx diff

* 4: For an existing UE capability already requires FR1-FR2 Diff and further differentiation between FR2-1 and FR2-2 is needed, the existing UE capability is replicated for FR2-2.
* 5: For UE capability that has to be per UE, “FR1-FR2 Diff” column can be used to express the need of the FRx differentiation (via the ‘Yes/No’ and also whether it needs FR2-1 and FR2-2 differentiation).
* Both 4 and 5 are taken as working assumption (can be revisited once we see the capabilities from RAN1/4)
* As working assumption, RAN2 assumes no need to extend RLC timer values for NR operation with 480, 960 kHz SCS. Can be revisited when we get more information from RAN1/4.
* Wait for RAN1 before discussing L2 buffer size to see if we get prohibitively large buffer sizes.