3GPP TSG-RAN WG2 Meeting #109bis-e R2-20xxxxx

**Electronic meeting, 20th - 30th April 2020**

Source: vivo

Agenda Item: 6.0.1

Title: Summary of [AT109bis-e][070][NR RIL] DiscMail7+DiscMail9(vivo)

Document for: Discussion and Decision

# Introduction & Background

This contribution will summary the following email discussion on ASN.1 RILs:

* [AT109bis-e][070][NR RIL] DiscMail7 + DiscMail9 (vivo)

Scope: Discussion and implementation of review issues.

Wanted outcome: a) Agreed RIL Status update in the email discussion report b) Agreed ASN.1/procedure text proposal included in the email discussion report.
After email discussion report is agreed, the TPs will be included in the ASN.1 Review file, for the continued ASN.1 review.

Deadline: Thursday, 30th April 2020 EOM (short extension may be considered, if necessary)

This email discussion addresses the following RILs:

* *ServingCellConfig* RILs: [S651], [S652]: MIMO
* *ServingCellConfig* RIL: [Z015]: NR-U
* *ServingCellConfigCommon* RIL: [Z019]: NR-U
* *MCGFailureInformation* RIL: [M005]: DCCA/MDT
* *RRCReconfiguration* RIL: [Z265]: MobEnh
* *SIB2* RILs: [Q002], [Q003]: PowSave
* *SIB2* RIL: [Q004]: TEI
* *SIB4* RIL: [Q005]: TEI

# Discussion

## *ServingCellConfig* RILs [S651], [S652], [Z015]

ServingCellConfig ::= SEQUENCE {

 tdd-UL-DL-ConfigurationDedicated TDD-UL-DL-ConfigDedicated OPTIONAL, -- Cond TDD

 initialDownlinkBWP BWP-DownlinkDedicated OPTIONAL, -- Need M

 downlinkBWP-ToReleaseList SEQUENCE (SIZE (1..maxNrofBWPs)) OF BWP-Id OPTIONAL, -- Need N

 downlinkBWP-ToAddModList SEQUENCE (SIZE (1..maxNrofBWPs)) OF BWP-Downlink OPTIONAL, -- Need N

 firstActiveDownlinkBWP-Id BWP-Id OPTIONAL, -- Cond SyncAndCellAdd

 bwp-InactivityTimer ENUMERATED {ms2, ms3, ms4, ms5, ms6, ms8, ms10, ms20, ms30,

 ms40,ms50, ms60, ms80,ms100, ms200,ms300, ms500,

 ms750, ms1280, ms1920, ms2560, spare10, spare9, spare8,

 spare7, spare6, spare5, spare4, spare3, spare2, spare1 } OPTIONAL, --Need R

 defaultDownlinkBWP-Id BWP-Id OPTIONAL, -- Need S

 uplinkConfig UplinkConfig OPTIONAL, -- Need M

 supplementaryUplink UplinkConfig OPTIONAL, -- Need M

 pdcch-ServingCellConfig SetupRelease { PDCCH-ServingCellConfig } OPTIONAL, -- Need M

 pdsch-ServingCellConfig SetupRelease { PDSCH-ServingCellConfig } OPTIONAL, -- Need M

 csi-MeasConfig SetupRelease { CSI-MeasConfig } OPTIONAL, -- Need M

 sCellDeactivationTimer ENUMERATED {ms20, ms40, ms80, ms160, ms200, ms240,

 ms320, ms400, ms480, ms520, ms640, ms720,

 ms840, ms1280, spare2,spare1} OPTIONAL, -- Cond ServingCellWithoutPUCCH

 crossCarrierSchedulingConfig CrossCarrierSchedulingConfig OPTIONAL, -- Need M

 tag-Id TAG-Id,

 dummy ENUMERATED {enabled} OPTIONAL, -- Need R

 pathlossReferenceLinking ENUMERATED {spCell, sCell} OPTIONAL, -- Cond SCellOnly

 servingCellMO MeasObjectId OPTIONAL, -- Cond MeasObject

 ...,

 [[

 lte-CRS-ToMatchAround SetupRelease { RateMatchPatternLTE-CRS } OPTIONAL, -- Need M

 rateMatchPatternToAddModList SEQUENCE (SIZE (1..maxNrofRateMatchPatterns)) OF RateMatchPattern OPTIONAL, -- Need N

 rateMatchPatternToReleaseList SEQUENCE (SIZE (1..maxNrofRateMatchPatterns)) OF RateMatchPatternId OPTIONAL, -- Need N

 downlinkChannelBW-PerSCS-List SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier OPTIONAL -- Need S

 ]],

 [[

 supplementaryUplinkRelease ENUMERATED {true} OPTIONAL, -- Need N

 tdd-UL-DL-ConfigurationDedicated-iab-mt-v16xy TDD-UL-DL-ConfigDedicated-IAB-MT-v16xy OPTIONAL, -- Need FFS

 firstWithinActiveTimeBWP-Id-r16 BWP-Id OPTIONAL, -- Cond MultipleNonDormantBWP

 firstOutsideActiveTimeBWP-Id-r16 BWP-Id OPTIONAL, -- Cond MultipleNonDormantBWP-WUS

 ca-SlotOffset-r16 CHOICE {

 refSCS15kHz INTEGER (-2..2),

 refSCS30KHz INTEGER (-5..5),

 refSCS60KHz INTEGER (-10..10),

 refSCS120KHz INTEGER (-20..20)

 } OPTIONAL, -- Cond AsyncCA

 channelAccessConfig-r16 ChannelAccessConfig-r16 OPTIONAL -- Need M

 ]]

}

UplinkConfig ::= SEQUENCE {

 initialUplinkBWP BWP-UplinkDedicated OPTIONAL, -- Need M

 uplinkBWP-ToReleaseList SEQUENCE (SIZE (1..maxNrofBWPs)) OF BWP-Id OPTIONAL, -- Need N

 uplinkBWP-ToAddModList SEQUENCE (SIZE (1..maxNrofBWPs)) OF BWP-Uplink OPTIONAL, -- Need N

 firstActiveUplinkBWP-Id BWP-Id OPTIONAL, -- Cond SyncAndCellAdd

 pusch-ServingCellConfig SetupRelease { PUSCH-ServingCellConfig } OPTIONAL, -- Need M

 carrierSwitching SetupRelease { SRS-CarrierSwitching } OPTIONAL, -- Need M

 ...,

 [[

 powerBoostPi2BPSK BOOLEAN OPTIONAL, -- Need M

 uplinkChannelBW-PerSCS-List SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier OPTIONAL -- Need S

 ]],

 [[

 bdFactorR-r16 ENUMERATED {n1} OPTIONAL, -- Need R

 lte-CRS-PatternList-r16 SetupRelease { LTE-CRS-PatternList-r16 } OPTIONAL, -- Cond LTE-CRS

 lte-CRS-PatternListSecond-r16 SetupRelease { LTE-CRS-PatternList-r16 } OPTIONAL, -- Cond CORESETPool

 enablePLRS-UpdateForPUSCH-SRS ENUMERATED {enabled} OPTIONAL, -- Need R

 enableDefaultBeamPL-ForPUSCH0 ENUMERATED {enabled} OPTIONAL, -- Need R

 enableDefaultBeamPL-ForPUCCH ENUMERATED {enabled} OPTIONAL, -- Need R

 enableDefaultBeamPL-ForSRS ENUMERATED {enabled} OPTIONAL -- Need R

 ]]

}

ChannelAccessConfig-r16 ::= SEQUENCE {

 maxEnergyDetectionThreshold-r16 INTEGER(-85..-52),

 energyDetectionThresholdOffset-r16 INTEGER (-20..-13),

 ul-toDL-COT-SharingED-Threshold-r16 INTEGER (-85..-52) OPTIONAL, -- Need R

 absenceOfAnyOtherTechnology-r16 ENUMERATED {true} OPTIONAL -- Need R

}

***ul-toDL-COT-SharingED-Threshold***

Maximum energy detection threshold that the UE should use to share channel occupancy with gNB for DL transmission with length no longer than 2, 4, and 8 OFDM symbols for 15Khz, 30Khz, 60KHz SCS respectively, as specified in TS 37.213 [48].

### RIL [S651]-MIMO

As shown, in current 38.331 ASN.1, *lte-CRS-ToMatchAround* is placed directly under *ServingCellConfig*, As, *lte-CRS-ToMatchAround*, *lte-CRS-PatternList-r16* and *lte-CRS-PatternListSecond-r16* are all for CRS rate matching pattern configuration. RIL [S651] thinks that, both *lte-CRS-PatternList-r16* and *lte-CRS-PatternListSecond-r16* should be aligned with *lte-CRS-ToMatchAround*.

As way of aligning *lte-CRS-PatternList-r16* and *lte-CRS-PatternListSecond-r16* with *lte-CRS-ToMatchAround* in ASN.1, RIL [S651] proposes to move *lte-CRS-PatternList-r16* and *lte-CRS-PatternListSecond-r16* from *UplinkConfig* and place them under *ServingCellConfig*.

**Q1: Do companies agree to *align lte-CRS-PatternList-r16 and lte-CRS-PatternListSecond-r16* with *lte-CRS-ToMatchAround*** **by moving them from *UplinkConfig* to *ServingCellConfig*?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

### RIL [S652]-MIMO

According to [1], *BDFactorR* is an optional UE-specific per DL serving cell parameter for determining and distributing the maximum numbers of BD/CCE for *mPDCCH* based *mPDSCH* transmission. But, as shown in 38.331 ASN.1, *bdFactorR* is captured under *UplinkConfig*. So, the RIL[S652] proposes to move *bdFactorR* from *UplinkConfig* to *ServingCellConfig* or *PDCCH-servingCellConfig*.

**Q2: To align with RAN1 parameter list for Rel-16 [1] description, *bdFactorR* should be move from *UplinkConfig* to:**

1. ***ServingCellConfig***
2. ***PDCCH-servingCellConfig***

|  |  |  |
| --- | --- | --- |
| **Company** | **Option: a or b** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

### RIL[Z015]-NR-U

As shown in 38.331 ASN.1, *ul-toDL-COT-SharingED-Threshold* (the Maximum energy detection threshold that the UE should use to share channel occupancy with gNB for DL transmission with length no longer than 2, 4, and 8 OFDM symbols for 15Khz, 30Khz, 60KHz SCS respectively) is captured with only a need code R.

At RAN1#98bis, RAN1 has made the following agreement:

|  |
| --- |
| **Agreement:*** The ED threshold that the UE applies when initiating a channel occupancy to be shared with the gNB is configured by gNB (RRC signaling)
	+ if ED threshold that the UE applies when initiating a channel occupancy to be shared with the gNB is not configured, the transmission of the gNB in UE initiated COT may include only control/broadcast signals/channels transmissions of up to 2/4/8 OFDM symbols in duration for 15/30/60 kHz SCS.
 |

According to the above RAN1 agreement RIL [Z015] thinks that there is a default behavior that needs to be specified when the field is not signaled. So, the need code needs to reflect that behavior and we need to specify the default behavior according to this agreement.

**Q3: Do companies agree to update the need code of *ul-toDL-COT-SharingED-Threshold* and define the default behavior? If Yes what may be the expected UE behavior?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **OPPO** | **No** | **The current field description says “**, as specified in TS 37.213**”, then I guess we can refer to the 213 which is supposed to capture the default behavior when the parameter is not configured**  |
|  |  |  |
|  |  |  |

## *ServingCellConfigCommon* RIL [Z019]-NR-U

ServingCellConfigCommon ::= SEQUENCE {

 physCellId PhysCellId OPTIONAL, -- Cond HOAndServCellAdd,

 downlinkConfigCommon DownlinkConfigCommon OPTIONAL, -- Cond HOAndServCellAdd

 uplinkConfigCommon UplinkConfigCommon OPTIONAL, -- Need M

 supplementaryUplinkConfig UplinkConfigCommon OPTIONAL, -- Need S

 n-TimingAdvanceOffset ENUMERATED { n0, n25600, n39936 } OPTIONAL, -- Need S

 ssb-PositionsInBurst CHOICE {

 shortBitmap BIT STRING (SIZE (4)),

 mediumBitmap BIT STRING (SIZE (8)),

 longBitmap BIT STRING (SIZE (64))

 } OPTIONAL, -- Cond AbsFreqSSB

 ssb-periodicityServingCell ENUMERATED { ms5, ms10, ms20, ms40, ms80, ms160, spare2, spare1 } OPTIONAL, -- Need S

 dmrs-TypeA-Position ENUMERATED {pos2, pos3},

 lte-CRS-ToMatchAround SetupRelease { RateMatchPatternLTE-CRS } OPTIONAL, -- Need M

 rateMatchPatternToAddModList SEQUENCE (SIZE (1..maxNrofRateMatchPatterns)) OF RateMatchPattern OPTIONAL, -- Need N

 rateMatchPatternToReleaseList SEQUENCE (SIZE (1..maxNrofRateMatchPatterns)) OF RateMatchPatternId OPTIONAL, -- Need N

 ssbSubcarrierSpacing SubcarrierSpacing OPTIONAL, -- Cond HOAndServCellWithSSB

 tdd-UL-DL-ConfigurationCommon TDD-UL-DL-ConfigCommon OPTIONAL, -- Cond TDD

 ss-PBCH-BlockPower INTEGER (-60..50),

 ...,

 [[

 channelAccessMode-r16 CHOICE {

 dynamic NULL,

 semistatic SemiStaticChannelAccessConfig

 } OPTIONAL, -- Need M

 discoveryBurst-WindowLength-r16 ENUMERATED {s0dot5, s1, s2, s3, s4, s5} OPTIONAL, -- Need M

 ssb-PositionQCL-r16 SSB-PositionQCL-Relationship-r16 OPTIONAL, -- Need M

 intraCellGuardBandUL-r16 IntraCellGuardBand-r16 OPTIONAL, -- Need M

 intraCellGuardBandDL-r16 IntraCellGuardBand-r16 OPTIONAL -- Need M

 ]]

}

IntraCellGuardBand-r16 ::= SEQUENCE (SIZE (1..ffsValue)) OF GuardBand-r16 -- FFS upper size 4, assuming 100Mhz cell

GuardBand-r16 ::= SEQUENCE {

 startCRB-r16 INTEGER (0..ffsValue), --FFS upper range 275

 nrofCRBs-r16 INTEGER (1..ffsValue)

}

RAN1 has made the following agreement:

|  |
| --- |
| **Agreement:**For FBE operation* FFP configuration is included in SIB-1
* FFP configuration can be signaled for a UE with UE-specific RRC signaling
 |

As shown in 38.331 ASN.1, the *semiStaticChannelAccessConfig* is captured under *ServingCellConfigCommon*. Based on above RAN1 agreement the RIL[Z019] thinks as the *semiStaticChannelAccessConfig* field can be UE specific, then it is proposed to add the FFP *semiStaticChannelAccessConfig* to *servingCellConfig* instead of *servingCellConfigCommon*.

**Q4: Do companies agree to move the FFP *semiStaticChannelAccessConfig* from *servingCellConfigCommon* to *servingCellConfig* instead?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **OPPO** | **Yes** |  |
|  |  |  |
|  |  |  |

## *MCGFailureInformation* RIL [M005]-DCCA/MDT

For *measResultFreqListEUTRA*, the procedural text is described as follows:

|  |
| --- |
| 1> for each EUTRA frequency the UE is configured to measure by *measConfig* for which measurement results are available:2> set the *measResultFreqListEUTRA* to include the best measured cells, ordered such that the best cell is listed first using RSRP to order if RSRP measurement results are available for cells on this frequency, otherwise using RSRQ to order if RSRQ measurement results are available for cells on this frequency, otherwise using SINR to order, and based on measurements collected up to the moment the UE detected the failure, and for each cell that is included, include the optional fields that are available; |

RIL[M005] pointed out that it included several neighbor cells per frequency. However, ASN.1 allows only one neighbor cell per frequency [2].

-- ASN1START

-- TAG-MCGFAILUREINFORMATION-START

MCGFailureInformation-r16 ::= SEQUENCE {

 criticalExtensions CHOICE {

 mcgFailureInformation-r16 MCGFailureInformation-r16-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

MCGFailureInformation-r16-IEs ::= SEQUENCE {

 failureReportMCG-r16 FailureReportMCG-r16 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportMCG-r16 ::= SEQUENCE {

 failureType-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx, spare},

 measResultFreqList-r16 MeasResultList2NR OPTIONAL,

 measResultFreqListEUTRA-r16 MeasResultList2EUTRA OPTIONAL,

 measResultSCG-r16 OCTET STRING (CONTAINING MeasResultSCG-Failure) OPTIONAL,

 measResultSCG-EUTRA-r16 OCTET STRING OPTIONAL,

 ...

}

MeasResultList2EUTRA ::= SEQUENCE (SIZE (1..maxNrofServingCellsEUTRA)) OF MeasResult2EUTRA

-- TAG-MCGFAILUREINFORMATION-STOP

-- ASN1STOP

***measResultFreqListEUTRA***

The field contains available results of measurements on E-UTRA frequencies the UE is configured to measure by *measConfig* associated with the MCG.

***MeasResult2EUTRA* information element**

-- ASN1START

-- TAG-MEASRESULT2EUTRA-START

MeasResult2EUTRA ::= SEQUENCE {

 carrierFreq ARFCN-ValueEUTRA,

 measResultServingCell MeasResultEUTRA OPTIONAL,

 measResultBestNeighCell MeasResultEUTRA OPTIONAL,

 ...

}

-- TAG-MEASRESULT2EUTRA-STOP

-- ASN1STOP

**Q5-1: Do companies agree that there is discrepancy between *measResultFreqListEUTRA* procedural text and ASN.1 for *measResultFreqListEUTRA* in *MCGFailureInformation* in term of neighbor cell number per frequency that UE can report?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **Ericsson** | **No** | **Regarding the EUTRA measurements results in MCGFailureInformation it has been applied the same principle of the SCGFailureInformation. Therefore, we think that nothing is needed here.**  |
| **Huawei, HiSilicon** | **No** | **We do not see a strong need of these changes. In addition, in SCGFailureInformationEUTRA message, there are similar field and procedural text, and that definition applies the same principle of MCGFailureInformation.** |
| **ZTE** | **Yes** | First, during email discussion [Post109e#37][DCCA], it is already agreed to change maxNrofServingCellsEURA into maxFreq, because UE should be allowed to include measurement results of multiple EUTRAN frequencies. MeasResultList2EUTRA ::= SEQUENCE (SIZE (1..~~maxNrofServingCellsEUTRA~~maxFreq)) OF MeasResult2EUTRASo each entry of the list can include measurement results of multiple neighbour cells on the same ETURA frequency.We agree with this RIL, and proposed change. |
|  |  |  |

MeasResultList2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2NR-r16

MeasResultList2EUTRA-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2EUTRA-r16

MeasResult2NR-r16 ::= SEQUENCE {

 ssbFrequency-r16 ARFCN-ValueNR OPTIONAL,

 refFreqCSI-RS-r16 ARFCN-ValueNR OPTIONAL,

 measResultList-r16 MeasResultListNR

}

MeasResultListLogging2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResultListLoggingNR-r16

MeasResultListLoggingNR-r16 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultLoggingNR-r16

MeasResultLoggingNR-r16 ::= SEQUENCE {

 physCellId-r16 PhysCellId,

 resultsSSB-Cell-r16 MeasQuantityResults,

 numberOfGoodSSB-r16 INTEGER (1..maxNrofSSBs-r16) OPTIONAL

}

MeasResult2EUTRA-r16 ::= SEQUENCE {

 carrierFreq-r16 ARFCN-ValueEUTRA,

 measResultList-r16 MeasResultListEUTRA

}

As shown in ASN.1, in R16 MDT WI, the IE *MeasResult2EUTRA-r16* is added which could report multiple neighbor cells per frequency. To resolve the above issue discussed in [M005], it is suggested that MCG failure information also use this *MeasResult2EUTRA-r16* IE

**Q5-2: If the ANS to Q5-1 is YES, do companies agree to use *MeasResult2EUTRA-r16* IE instead of *MeasResult2EUTRA* IEfor *measResultFreqListEUTRA* in *MCGFailureInformation*?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **Ericsson** | **No** | **See comment to Q5-1.** |
| **ZTE** | **Yes** | **See comment to Q5-1.** |
|  |  |  |

## *RRCReconfiguration* RIL [Z265]-MobEnh

RIL [Z265] pointed out that, it would better to clarify that “the cell” is “the PCell” to restrict the scenario of target CHO configuration in the legacy HO command since the change of SCell in *masterCellGroup* is allowed.

**Q6-1: Do companies agree that it is necessary to clarify that “the cell” is “the PCell” to restrict the scenario of target CHO configuration in the legacy HO command since the change of SCell in *masterCellGroup* is allowed?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **OPPO** | **Yes** |  |
| **Huawei, HiSilicon** | **Yes** |  |
|  |  |  |

For solution to clarify “the cell” is “the PCell”, RIL [Z265] further proposes to change “cell” and “serving cell” to “PCell” and “serving PCell” respectively in the following field description sentence “The field is absent if *dapsConfig* is configured for any DRB or the cell indicated in *masterCellGroup* is different from the serving cell”. Based on rapporteur comment to this RIL, as an alternative solution, it was also proposed to consider to build the condition on “SpCell change”. E.g. “This field is absent upon SpCell change and when *dapsConfig* is configured for any DRB”.

**Q6-2: If the ANS to Q6-1 is YES, do companies agree to reflect the restriction that the scenario of target CHO configuration in target CHO command is not supported in Rel-16 by:**

1. **Update the sentence “*The field is absent if dapsConfig is configured for any DRB or the cell indicated in masterCellGroup is different from the serving cell*” by changing “Cell” and “serving cell” to “PCell” and “serving PCell” respectively**
2. **Build condition on “SpCell change” e.g. “This field is absent upon SpCell change and when *dapsConfig* is configured for any DRB”**
3. **“This field is absent upon PCell handover, PSCell change and when *dapsConfig* is configured for any DRB”**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option: a) or b)** | **Comments** |
| **OPPO** | **Option c)** | **Not sure SpCell change really covers PCell handover, especially for the case of intra-cell handover. So we propose a modified option, i.e. option c)** |
| **Huawei, HiSilicon** | **Option b)** | **In the 38.331 ASN1 excel file, there is a rapporteur view as below:****Rapp1: Could rather consider a Cond. Also consider to biuld the condition on “Spcell change”. E.f. ““This field is absent upon SpCell change and when dapsConfig is configured for any DRB”.****We share the same view with Rapporteur’s comment, i.e the whole field description can be reworded following the restriction pattern suggested by Rapporteur. Option b) is the same as proposed by Rapp1.** |
|  |  |  |

## *SIB2* RILs [Q002], [Q003], [Q004], *SIB4* RIL [Q005]

***SIB2* information element**

-- ASN1START

-- TAG-SIB2-START

SIB2 ::= SEQUENCE {

 cellReselectionInfoCommon SEQUENCE {

 nrofSS-BlocksToAverage INTEGER (2..maxNrofSS-BlocksToAverage) OPTIONAL, -- Need S

 absThreshSS-BlocksConsolidation ThresholdNR OPTIONAL, -- Need S

 rangeToBestCell RangeToBestCell OPTIONAL, -- Need R

 q-Hyst ENUMERATED {

 dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

 dB12, dB14, dB16, dB18, dB20, dB22, dB24},

 speedStateReselectionPars SEQUENCE {

 mobilityStateParameters MobilityStateParameters,

 q-HystSF SEQUENCE {

 sf-Medium ENUMERATED {dB-6, dB-4, dB-2, dB0},

 sf-High ENUMERATED {dB-6, dB-4, dB-2, dB0}

 }

 } OPTIONAL, -- Need R

 ...,

 [[

 relaxedMeasurement-r16 SEQUENCE {

 lowMobilityEvalutation-r16 SEQUENCE {

 s-SearchDeltaP-r16 ENUMERATED {

 dB3, dB6, dB9, dB12, dB15,

 spare3, spare2, spare1} OPTIONAL, -- Need S

 t-SearchDeltaP-r16 ENUMERATED {

 s5, s10, s20, s30, s60, s120, s180,

 s240, s300, spare7, spare6, spare5,

 spare4, spare3, spare2, spare1} OPTIONAL -- Need S

 } OPTIONAL, -- Cond OptMandatory

 cellEdgeEvalutation-r16 SEQUENCE {

 s-SearchThresholdP-r16 ReselectionThreshold OPTIONAL, -- Need R

 s-SearchThresholdQ-r16 ReselectionThresholdQ OPTIONAL -- Need R

 } OPTIONAL, -- Cond OptMandatory

 relaxedMeasCondition-r16 ENUMERATED {

 lowMobilityOrNotAtCellEdge,

 lowMobilityAndNotAtCellEdge} OPTIONAL, -- Cond MultRelaxCriteria

 highPriorityMeasRelax-r16 ENUMERATED {true} OPTIONAL -- Need R

 } OPTIONAL -- Need R

 ]]

 },

 cellReselectionServingFreqInfo SEQUENCE {

 s-NonIntraSearchP ReselectionThreshold OPTIONAL, -- Need S

 s-NonIntraSearchQ ReselectionThresholdQ OPTIONAL, -- Need S

 threshServingLowP ReselectionThreshold,

 threshServingLowQ ReselectionThresholdQ OPTIONAL, -- Need R

 cellReselectionPriority CellReselectionPriority,

 cellReselectionSubPriority CellReselectionSubPriority OPTIONAL, -- Need R

 ...

 },

 intraFreqCellReselectionInfo SEQUENCE {

 q-RxLevMin Q-RxLevMin,

 q-RxLevMinSUL Q-RxLevMin OPTIONAL, -- Need R

 q-QualMin Q-QualMin OPTIONAL, -- Need S

 s-IntraSearchP ReselectionThreshold,

 s-IntraSearchQ ReselectionThresholdQ OPTIONAL, -- Need S

 t-ReselectionNR T-Reselection,

 frequencyBandList MultiFrequencyBandListNR-SIB OPTIONAL, -- Need S

 frequencyBandListSUL MultiFrequencyBandListNR-SIB OPTIONAL, -- Need R

 p-Max P-Max OPTIONAL, -- Need S

 smtc SSB-MTC OPTIONAL, -- Need S

 ss-RSSI-Measurement SS-RSSI-Measurement OPTIONAL, -- Need R

 ssb-ToMeasure SSB-ToMeasure OPTIONAL, -- Need S

 deriveSSB-IndexFromCell BOOLEAN,

 ...,

 [[

 t-ReselectionNR-SF SpeedStateScaleFactors OPTIONAL -- Need N

 ]],

 [[

 smtc2-LP-r16 SSB-MTC2-LP-r16 OPTIONAL, -- Need R

 ssb-PositionQCL-Common-r16 SSB-PositionQCL-Relationship-r16 OPTIONAL -- Need R

 ]]

 }, ...

}

RangeToBestCell ::= Q-OffsetRange

-- TAG-SIB2-STOP

-- ASN1STOP

| ***SIB2* field descriptions** |
| --- |
| ***absThreshSS-BlocksConsolidation***Threshold for consolidation of L1 measurements per RS index. If the field is absent, the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***cellEdgeEvalutation***Indicates the criteria for a UE to detect that it is not at cell edge, in order to relax measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.X.2). |
| ***cellReselectionInfoCommon***Cell re-selection information common for intra-frequency, inter-frequency and/ or inter-RAT cell re-selection. |
| ***cellReselectionServingFreqInfo***Information common for non-intra-frequency cell re-selection i.e. cell re-selection to inter-frequency and inter-RAT cells. |
| ***deriveSSB-IndexFromCell***This field indicates whether the UE can utilize serving cell timing to derive the index of SS block transmitted by neighbour cell. If this field is set to *true*, the UE assumes SFN and frame boundary alignment across cells on the serving frequency as specified in TS 38.133 [14]. |
| ***frequencyBandList***Indicates the list of frequency bands for which the NR cell reselection parameters apply. The UE behaviour in case the field is absent is described in subclause 5.2.2.4.3. |
| ***highPriorityMeasRelax***Indicates whether measurements can be relaxed on high priority frequencies (see TS 38.304 [20], clause 5.2.4.X.0). If the field is absent, the UE shall not relax measurements on high priority frequencies |
| ***intraFreqCellReselectionInfo***Cell re-selection information common for intra-frequency cells. |
| ***lowMobilityEvalutation***Indicates the criteria for a UE to detect low mobility, in order to relax measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.X.1). |
| ***nrofSS-BlocksToAverage***Number of SS blocks to average for cell measurement derivation. If the field is absent the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***p-Max***Value in dBm applicable for the intra-frequency neighbouring NR cells. If absent the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if *p-Max* is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39].  |
| ***q-Hyst***Parameter "*Qhyst*" in TS 38.304 [20], Value in dB. Value *dB1* corresponds to 1 dB, *dB2* corresponds to 2 dB and so on. |
| ***q-HystSF***Parameter "Speed dependent ScalingFactor for Qhyst" in TS 38.304 [20]. The *sf-Medium* and *sf-High* concern the additional hysteresis to be applied, in Medium and High Mobility state respectively, to Qhyst as defined in TS 38.304 [20]. In dB. Value *dB-6* corresponds to -6dB, *dB-4* corresponds to -4dB and so on. |
| ***q-QualMin***Parameter "Qqualmin" in TS 38.304 [20], applicable for intra-frequency neighbour cells. If the field is absent, the UE applies the (default) value of negative infinity for Qqualmin.  |
| ***q-RxLevMin***Parameter "Qrxlevmin" in TS 38.304 [20], applicable for intra-frequency neighbour cells. |
| ***q-RxLevMinSUL***Parameter "Qrxlevmin" in TS 38.304 [20], applicable for intra-frequency neighbour cells. |
| ***rangeToBestCell***Parameter "rangeToBestCell" in TS 38.304 [20]. The network configures only non-negative (in dB) values. |
| ***relaxedMeasCondition***When both *lowMobilityEvalutation* and *cellEdgeEvalutation* are present in *SIB2*, this parameter configures the condition for the UE to relax measurements (see TS 38.304 [20], clause 5.2.4.X.0). |
| ***relaxedMeasurement***Configuration to allow relaxation of RRM measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.X). |
| ***s-IntraSearchP***Parameter "SIntraSearchP" in TS 38.304 [20]. |
| ***s-IntraSearchQ***Parameter "SIntraSearchQ2 in TS 38.304 [20]. If the field is absent, the UE applies the (default) value of 0 dB for SIntraSearchQ. |
| ***s-NonIntraSearchP***Parameter "SnonIntraSearchP" in TS 38.304 [20]. If this field is absent, the UE applies the (default) value of infinity for SnonIntraSearchP. |
| ***s-NonIntraSearchQ***Parameter "SnonIntraSearchQ" in TS 38.304 [20]. If the field is absent, the UE applies the (default) value of 0 dB for SnonIntraSearchQ. |
| ***s-SearchDeltaP***Parameter "SSearchDeltaP" in TS 38.304 [20]. Value dB3 corresponds to 3 dB, dB6 corresponds to 6 dB and so on. If the field is absent, the UE applies the (default) value of 6 dB for *s-SearchDeltaP*. |
| ***s-SearchThresholdP***Parameter "SSearchThresholdP" in TS 38.304 [20]. |
| ***s-SearchThresholdQ***Parameter "SSearchThresholdQ" in TS 38.304 [20]. |
| ***smtc***Measurement timing configuration for intra-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms for the intra-frequnecy cells. |
| ***smtc2-LP-r16***Measurement timing configuration for intra-frequency neighbour cells with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP-r16*. The timing offset and duration are equal to the offset and duration indicated in *smtc* in *intraFreqCellReselectionInfo*. The periodicity in *smtc2-LP-r16* can only be set to a value strictly larger than the periodicity in *smtc* in *intraFreqCellReselectionInfo* (e.g. if *smtc* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *smtc* indicates sf160, *smtc2-LP-r16* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the intra-frequency neighbour cells with Long Periodicity. If *smtc2-LP-r16* is absent, the UE assumes that there are no intra-frequency neighbour cells with a Long Periodicity. |
| ***ssb-PositionQCL-Common***Indicates the QCL relationship between SS/PBCH blocks for intra-frequency neighbor cells as specified in TS 38.213 [13], clause 4.1. |
| ***ssb-ToMeasure***The set of SS blocks to be measured within the SMTC measurement duration (see TS 38.215 [9]). When the field is absent the UE measures on all SS-blocks. |
| ***t-ReselectionNR***Parameter "TreselectionNR" in TS 38.304 [20]. |
| ***t-ReselectionNR-SF***Parameter "Speed dependent ScalingFactor for TreselectionNR" in TS 38.304 [20]. If the field is absent, the UE behaviour is specified in TS 38.304 [20]. |
| ***threshServingLowP***Parameter "ThreshServing, LowP" in TS 38.304 [20]. |
| ***threshServingLowQ***Parameter "ThreshServing, LowQ" in TS 38.304 [20]. |
| ***t-SearchDeltaP***Parameter "TSearchDeltaP" in TS 38.304 [20]. Value in seconds. Value *s5* means 5 seconds, value *s10* means 10 seconds and so on. If the field is absent, the UE applies the (default) value of 60 seconds for *t-SearchDeltaP*. |

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| Conditional Presence | Explanation |
| *MultRelaxCriteria* | The field is mandatory present if *lowMobilityEvalutation* and *cellEdgeEvalutation* are present in *SIB2*; otherwise it is absent. |
| *OptMandatory* | Either *lowMobilityEvalutation* or *cellEdgeEvalutation* field is mandatory present if *relaxedMeasurement* is configured. The field is optionally present, Need R, otherwise. |

### RIL [Q002]-PowSave

As highlighted in yellow in ASN.1, RIL[Q002] pointed out that *relaxedMeasurement-r16* field is implemented before release-15 fields. And further suggests to move this field at the end of release-15 fields.

**Q7: Do companies agree to move the *relaxedMeasurement-r16* extension field at the end after Release-15 fields?**

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| **Company** | **Yes/No** | **Comments** |
| **Huawei, HiSilicon** | **Yes** | Extension has to be at the end otherwise R16 isn’t backwards compatible. |
| OPPO | Yes | Agree with Huawei. |
| Intel | Yes | Note that the impacted sections are also updated in the drafted PWS CR to 38.331 discussed on email discussion #504 (details provided in RIL [Q003] below), therefore we wonder whether this change should be implemented there. |

### RIL [Q003]-PowSave

RIL [Q003] think that the use of need codes is not sufficiently clear and may be confusing. RIL [Q003] understands that:

* In case of low mobility based relaxation, *s-SearchDeltaP-r16* is mandatory present and t-SearchDeltaP-r16 is optional.
* In case of not-at-cell-edge based relaxation, at least one of *s-SearchThresholdP-r16* and *s-SearchThresholdQ-r16* shall be configured.

RIL [Q003] suggests to sufficiently capture 38.304 logics such as the relaxed measurement requires either low mobility based or not-at-cell-edge based condition to be configured. RIL [Q003] further proposes the following changes:

* Make *s-SearchDeltaP-r16* as mandatory present.
* Change *t-SearchDeltaP-r16* need code to Need R
* Remove the condition of *lowMobilityEvalutation-r16* and the need code Need R
* Remove the condition of *cellEdgeEvalutation-r16* and the need code Need R

**Q8: Do companies agree to update *relaxedMeasurement-r16* with the following changes:**

* **Make *s-SearchDeltaP-r16* as mandatory present.**
* **Change *t-SearchDeltaP-r16* need code to Need R**
* **Remove the condition of *lowMobilityEvalutation-r16* and the need code Need R**
* **Remove the condition of *cellEdgeEvalutation-r16* and the need code Need R**

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| **Company** | **Yes/No** | **Comments** |
| **Huawei, HiSilicon** | **Partially Yes** | s-SearchDeltaP-r16, t-SearchDeltaP-r16:* We think both IEs should be MP as it saves 1 bit per IE in SIBs. It was previously agreed to be optional with default but there is no good reason for that.

s-SearchThresholdP-r16:* should also be MP as it is required for the cell edge evaluation.

s-SearchThresholdQ-r16:* should remain as optional, this is really optional.
 |
| OPPO |  | This issue has been discussed in the power saving session, and the following agreements were made.1. IEs s-SearchDeltaP and t-searchDeltaP are mandatory fields [CB if an issue is identified].2. Leave it to NW implementation to ensure that at least lowMobilityEvalutation or cellEdgeEvalutation IEs are present when relaxedMeasurement is configured. Based on the agreement, both s-SearchDeltaP and t-searchDeltaP are mandatory present. And we agree with the proposed change for lowMobilityEvalutation-r16 and cellEdgeEvalutation-r16. |
| Intel | - | No need to re-discuss this issue as it was already discussed on Monday CB session as part of email discussion #504 (with report on R2-2003957). Related agreements copied below for your reference:1. *Update relaxedMeasCondition IE to a Boolean flag ‘combineRelaxedMeasConditions’*
2. *IEs s-SearchDeltaP and t-searchDeltaP are mandatory fields [CB if an issue is identified]*
3. *Leave it to NW implementation to ensure that at least lowMobilityEvalutation or cellEdgeEvalutation IEs are present when relaxedMeasurement is configured.*
 |

### RIL [Q004], [Q005]-TEI

RIL [Q004] and RIL [Q005] are common issues for SIB2 and SIB4. They expressed concern that, as the (first) smtc field can be absent and the UE assumes 5ms for all cells, UE behaviour is not entirely clear in case of absence of *pci-List.* So, RIL [Q004] proposes to clarify UE behavior and consider correcting the need code for *pci-List* in *SSB-MTC2-LP-r16*, depending on the outcome.

SSB-MTC2-LP-r16 ::= SEQUENCE {

 pci-List SEQUENCE (SIZE (1..maxNrofPCIsPerSMTC)) OF PhysCellId OPTIONAL, -- Need R

 periodicity ENUMERATED {sf10, sf20, sf40, sf80, sf160, spare3, spare2, spare1}

}

**Q9: Do companies agree that more clarification is needed on UE behaviour in case of absence of *pci-List*, and further correcting the need code for *pci-List*? If yes, what may be the expected behavior?**

|  |  |  |
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| **Company** | **Yes/No** | **Comments** |
| **Huawei, HiSilicon** | **No** | For both Q004 and Q0005:Not needed because the pci-List in SSB-MTC2-LP is “need R” instead of “need S”. Besides, there’s no reason for the network to configure SSB-MTC2-LP while not including the pci-List. For the smtc2 in measObjectNR, there’s no similar default behavior either. |
| **ZTE** | **Yes** | We think for system information, when providing SSB-MTC2-LP-r16, pci-list must be included. So we are ok to remove the “OPTIONAL –Need R”, to make pci-list mandatory within SSB-MTC2-LP-r16 structure. |
|  |  |  |

# Conclusion

Outcome

# Reference

[1] R1-2001478, “Updated consolidated parameter list for Rel-16 NR”

[2] R2-2003654 38.331 CR Discussion on MeasResult2EUTRA, MediaTek Inc.