3GPP TSG-RAN WG2 #112-e R2-201xxxx

Electronic meeting, 2nd November - 13th November 2020

Agenda Item: 6.10.3

Source: Ericsson

Title: [AT112-e][899][NR/R16 SON/MDT] Changes related to RAReport and logged MDT report contents BC change (Ericsson )

Document for: Discussion, Decision

# Introduction

This document is related to the following discussion.

R2-2010891 Changes related to RAReport and logged MDT report contents BC change Ericsson CR Rel-16 38.331 16.2.0 2262 - C NR\_SON\_MDT-Core revison of R2-2010619

=> continue the discussion through email (The target is to produce the agreeable BC CR, Ericsson #899).

* [AT112-e][899][NR/R16 SON/MDT] Changes related to RAReport and logged MDT report contents BC change (Ericsson )

Scope: discussion through email on R2-2010891

Intended outcome: Agreeable CR and the CR should be merged to the big CR from email discussion 888.

Deadline: 23:59 pm, 2020-11-12

# Discussion

## RA report related correction

The changes associated to the RA report changes are captured in section 4.1. Companies are requested to provide their input on the changes. If your company has a different implementation proposal, then it is requested that the changes are to be provided in subsequent subsections (4.1.1, 4.1.2 etc.) with the name of the company in the title.

|  |  |  |
| --- | --- | --- |
| **Company name** | **Agree/Disagree** | **Further comments (if your company prefers a different implementation than the one provided in main section 4.1, then please indicated which implementation is preferred amongst the sub-sections 4.1.1, 4.1.2 etc.)** |
| Ericsson | Agree (proponent) |  |
| Samsung | Disagree | We would like to avoid any ASN.1 update because R16 has already closed. Furthermore, we are not sure if the suggested update really corresponds to the previous agreement. We think it’s a new proposal.  We discussed and agreed this issue in RAN2#111e:  R2-2007657 On the need of SCell indication in the RA-report Ericsson discussion[20]  => Changes are agreed and merged into big SON CR.  The contribution, R2-2007657 has the following proposal:  **Proposal 1** **Modify the existing cellID, in order to allow the UE to include either the SpCell or the SCell in which RA occurred when the r*aPurpose* is set to *ulUnSynchronized*.**  Actually, RAN2 has not agreed to log all cells related to a RA (please see above “either … or …”). We then assumed to log the information of the cell in which the preamble was transmitted.  Hence, the current specification has been updated as follows:  4> set the *cellId* to the global cell identity and the tracking area code, if available, otherwise to the physical cell identity and carrier frequency of the cell in which the corresponding random-access preamble was transmitted;  This suggested change is to log all the cells related to RA, and it is not in line with the previous agreement.  We are not now mentioning any technical point of view. The change may be helpful for MDT purpose. However, all proposals introduced in this meeting should intend to avoid any critical problem. Since R16 has already closed, it’s really too late to touch the current ASN.1.  We have understood that the change is an optimization and new UE behaviour. Even though the change is not agreed, we cannot see any critical problem. |
| OPPO | Disagree | Agree with Samsung that, at this stage, ASN.1 update and procedural text modification should be avoided as much as possible. In addition, In our knowledge, the SCell RA related information was not agreed to be included in the RA report. |
| Qualcomm | Disagree | While we see Ericsson point, however, we agree with Samsung that it is quite late for such ASN.1 changes to fix such a small issue. In the mobility history information, we have option of providing CGI or PCI together with carrier frequency. I am not sure that if network can resolve cell information in mobility history information, then why resolving cell information using SCell PCI and carrier frequency is such a bigh deal.  According to us, this is not a very crucial issue and have limited scope since RA on SCell is usually for timing-alignment or SR in Connected mode.  However, if majority of companies think that the issue is critical and want to resolve this, we have following choice:  RA-Report-r16 ::= SEQUENCE {  cellId-r16 CHOICE {  cellGlobalId-r16 CGI-Info-Logging-r16,  pci-arfcn-r16 SEQUENCE {  physCellId-r16 PhysCellId,  carrierFreq-r16 ARFCN-ValueNR  }  },  ra-InformationCommon-r16 RA-InformationCommon-r16,  raPurpose-r16 ENUMERATED{accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized, schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI, spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1},  nonCriticalExtension RA-Report-16xy OPTIONAL  }  RA-report-16xy ::= SEQUENCE {  PCellPSCellId-r16 CGI-Info-Logging-r16 OPTIONAL  } |
| CATT | Disagree | We think this change is more like a optimization. For RLF, either CGI or PCI+Frequency info can be included in RLF report, no problem is identified, the same principle for RACH report. Even if not agreed, the consequence is not significant. So we prefer to not have this change. |
|  |  |  |
|  |  |  |

**Summary:**

To be added later

## Logged MDT related correction

The changes associated to the numberOfGoodBeams related corrections are captured in section 4.2. Companies are requested to provide their input on the changes. If your company has a different implementation proposal, then it is requested that the changes are to be provided in subsequent subsections (4.2.1, 4.2.2 etc.) with the name of the company in the title.

|  |  |  |
| --- | --- | --- |
| **Company name** | **Agree/Disagree** | **Further comments (if your company prefers a different implementation than the one provided in main section 4.2, then please indicated which implementation is preferred amongst the sub-sections 4.2.1, 4.2.2 etc.)** |
| Ericsson | Agree (proponent) |  |
| Samsung | Disagree | We have understood it’s an optimization rather than to solve any critical problem. We would like to keep the current ASN.1.  As introduced in last CC, the field, numberOfGoodSSB would be absent in the two cases, i.e. no actual good beam or no configuration of the threshold.  Upon informing network of the absent field, it may be difficult for the network to distinguish between two cases, However, it never be important, i.e. if the network has not configured the threshold, it would simply ignore the absent field. Otherwise, the network interprets it as no good beam on the absent field.  Even though the change is not agreed, we cannot see any critical problem. |
| OPPO | Disagree | We don’t think the network optimization could be benefited too much from the added *numberOfGoodSSB* IE.  If none of SSB measurement result is higher than *absThrehSS-BlockConsolidation*, the cell level measurement result is equal to the best SSB measurement result (lower than *absThrehSS-BlockConsolidation* ). Network could find such information from the logged MDT report and therefore optimize the coverage.  Otherwise, if there exists SSB measurement result that is higher than *absThrehSS-BlockConsolidation*, even if there are only one or two such SSBs, it has no negative impact on UE communication quality, especially for FR1 the range for each SSB is relatively larger, and therefore network might not need to do optimization. |
| Qualcomm | Disagree | We agree with Samsung that this an optimization rather than to solve any critical problem. Furthermore, for non serving cell, numberOfGoodSSB should be considered by default zero if information is not provided by the UE to the network. In the meeting two scenarios were pointed out that this can be not provided by the UE if number of good SSB is actually zero or network doesnot configure. We agree that if Samsung that if it is not configured by network then network should smiley ignore that. In the case of numberOfGoodSSB in the serving cell, we believe that this is highly unlikely. |
| CATT |  | We agree the intention, but changing ASN.1 in a large scale for this small issue is not acceptable, we can try to clarify this in the field description. |
|  |  |  |
|  |  |  |

**Summary:**

To be added later

# Conclusion

To be added later

# Proposed CR

## Changes associated RA report correction

*START OF CHANGE*

#### 5.7.10.4 Actions upon successful completion of random-access procedure

Upon successfully performing 4 step random access procedure, the UE shall:

1> if the number of RA-Report stored in the RA-ReportList is less than *maxRAReport*:

2> if the number of PLMN entries in *plmn-IdentityList* stored in *VarRA-Report* is less than *maxPLMN*; or

2> if the number of PLMN entries in *plmn-IdentityList* stored in *VarRA-Report* is equal to *maxPLMN* and the list of EPLMNs is subset of or equal to the *plmn-IdentityList* stored in *VarRA-Report*:

3> append the following contents associated to the successfully completed random-access procedure as a new entry in the *VarRA-Report*:

4> if the list of EPLMNs has been stored by the UE:

5> if the RPLMN is included in *plmn-IdentityList* stored in *VarRA-Report*:

6> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN) without exceeding the limit of *maxPLMN*;

5> else:

6> clear the information included in *VarRA-Report*;

6> set the *plmn-IdentityList* to the list of EPLMNs stored by the UE (i.e. includes the RPLMN);

4> else:

5> set the *plmn-Identity*, in *plmn-IdentityList*, to the PLMN selected by upper layers from the PLMN(s) included in the *plmn-IdentityList* in SIB1;

4> set the *cellId* to the global cell identity and the tracking area code of the PCell if the RA procedure is performed on the MCG, or of PSCell if the RA procedure is performed on the SCG;

4> if the random access preamble was transmitted in the SCell:

5-> set the *sCellID* to the physical cell identity and carrier frequency of the SCell.

4> set the *raPurpose* to include the purpose of triggering the random-access procedure;

4> set the *ra-InformationCommon-r16* as specified in subclause 5.7.10.5.

The UE may discard the random access report information, i.e. release the UE variable *VarRA-Report*, 48 hours after the last successful random access procedure related information is added to the *VarRA-Report*.

NOTE 1: The UE does not log the RA information in the RA report if the triggering event of the random access is consistent UL LBT on SpCell as specified in TS 38.321 [6].

*NEXT CHANGE*

### 6.2.2 Message definitions

*<Text Omitted>*

#### – *UEInformationResponse*

The *UEInformationResponse* message is used by the UE to transfer information requested by the network.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*UEInformationResponse message*

-- ASN1START

-- TAG-UEINFORMATIONRESPONSE-START

UEInformationResponse-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueInformationResponse-r16 UEInformationResponse-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationResponse-r16-IEs ::= SEQUENCE {

measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

logMeasReport-r16 LogMeasReport-r16 OPTIONAL,

connEstFailReport-r16 ConnEstFailReport-r16 OPTIONAL,

dummyRa-ReportList DummyRA-ReportList OPTIONAL,

rlf-Report-r16 RLF-Report-r16 OPTIONAL,

mobilityHistoryReport-r16 MobilityHistoryReport-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEInformationResponse-v16xy-IEs OPTIONAL

}

UEInformationResponse-v16xy-IEs ::= SEQUENCE {

ra-ReportList-r16 RA-ReportList-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

LogMeasReport-r16 ::= SEQUENCE {

absoluteTimeStamp-r16 AbsoluteTimeInfo-r16,

traceReference-r16 TraceReference-r16,

traceRecordingSessionRef-r16 OCTET STRING (SIZE (2)),

tce-Id-r16 OCTET STRING (SIZE (1)),

logMeasInfoList-r16 LogMeasInfoList-r16,

logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

...

}

LogMeasInfoList-r16 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r16)) OF LogMeasInfo-r16

LogMeasInfo-r16 ::= SEQUENCE {

locationInfo-r16 LocationInfo-r16 OPTIONAL,

relativeTimeStamp-r16 INTEGER (0..7200),

servCellIdentity-r16 CGI-Info-Logging-r16 OPTIONAL,

measResultServingCell-r16 MeasResultServingCell-r16 OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR MeasResultListLogging2NR-r16 OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

anyCellSelectionDetected-r16 ENUMERATED {true} OPTIONAL

}

ConnEstFailReport-r16 ::= SEQUENCE {

measResultFailedCell-r16 MeasResultFailedCell-r16,

locationInfo-r16 LocationInfo-r16 OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR MeasResultList2NR-r16 OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

numberOfConnFail-r16 INTEGER (1..8),

perRAInfoList-r16 PerRAInfoList-r16,

timeSinceFailure-r16 TimeSinceFailure-r16,

...

}

MeasResultServingCell-r16 ::= SEQUENCE {

resultsSSB-Cell MeasQuantityResults,

resultsSSB SEQUENCE{

best-ssb-Index SSB-Index,

best-ssb-Results MeasQuantityResults,

numberOfGoodSSB INTEGER (1..maxNrofSSBs-r16)

} OPTIONAL

}

MeasResultFailedCell-r16 ::= SEQUENCE {

cgi-Info CGI-Info-Logging-r16,

measResult-r16 SEQUENCE {

cellResults-r16 SEQUENCE{

resultsSSB-Cell-r16 MeasQuantityResults

},

rsIndexResults-r16 SEQUENCE{

resultsSSB-Indexes-r16 ResultsPerSSB-IndexList

}

}

}

DummyRA-ReportList ::= SEQUENCE (SIZE (1..maxRAReport-r16)) OF DummyRA-Report

RA-ReportList-r16 ::= SEQUENCE (SIZE (1..maxRAReport-r16)) OF RA-Report-r16

DummyRA-Report ::= SEQUENCE {

cellId-r16 CHOICE {

cellGlobalId-r16 CGI-Info-Logging-r16,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

ra-InformationCommon-r16 RA-InformationCommon-r16,

raPurpose-r16 ENUMERATED {accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized,

schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI,

spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1}

}

RA-Report-r16 ::= SEQUENCE {

cellId-r16 CGI-Info-Logging-r16,

sCellID-r16 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

} OPTIONAL, -- Cond SCellRA

ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

raPurpose-r16 ENUMERATED {accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized,

schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI,

spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1},

...

}

RA-InformationCommon-r16 ::= SEQUENCE {

absoluteFrequencyPointA-r16 ARFCN-ValueNR,

locationAndBandwidth-r16 INTEGER (0..37949),

subcarrierSpacing-r16 SubcarrierSpacing,

msg1-FrequencyStart-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msg1-FrequencyStartCFRA-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msg1-SubcarrierSpacing-r16 SubcarrierSpacing OPTIONAL,

msg1-SubcarrierSpacingCFRA-r16 SubcarrierSpacing OPTIONAL,

msg1-FDM-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

msg1-FDMCFRA-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

perRAInfoList-r16 PerRAInfoList-r16

}

PerRAInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAInfo-r16

PerRAInfo-r16 ::= CHOICE {

perRASSBInfoList-r16 PerRASSBInfo-r16,

perRACSI-RSInfoList-r16 PerRACSI-RSInfo-r16

}

PerRASSBInfo-r16 ::= SEQUENCE {

ssb-Index-r16 SSB-Index,

numberOfPreamblesSentOnSSB-r16 INTEGER (1..200),

perRAAttemptInfoList-r16 PerRAAttemptInfoList-r16

}

PerRACSI-RSInfo-r16 ::= SEQUENCE {

csi-RS-Index-r16 CSI-RS-Index,

numberOfPreamblesSentOnCSI-RS-r16 INTEGER (1..200)

}

PerRAAttemptInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAAttemptInfo-r16

PerRAAttemptInfo-r16 ::= SEQUENCE {

contentionDetected-r16 BOOLEAN OPTIONAL,

dlRSRPAboveThreshold-r16 BOOLEAN OPTIONAL,

...

}

RLF-Report-r16 ::= CHOICE {

nr-RLF-Report-r16 SEQUENCE {

measResultLastServCell-r16 MeasResultRLFNR-r16,

measResultNeighCells-r16 SEQUENCE {

measResultListNR-r16 MeasResultList2NR-r16 OPTIONAL,

measResultListEUTRA-r16 MeasResultList2EUTRA-r16 OPTIONAL

} OPTIONAL,

c-RNTI-r16 RNTI-Value,

previousPCellId-r16 CHOICE {

nrPreviousCell-r16 CGI-Info-Logging-r16,

eutraPreviousCell-r16 CGI-InfoEUTRALogging

} OPTIONAL,

failedPCellId-r16 CHOICE {

nrFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-Info-Logging-r16,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

eutraFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-InfoEUTRALogging,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 EUTRA-PhysCellId,

carrierFreq-r16 ARFCN-ValueEUTRA

}

}

},

reconnectCellId-r16 CHOICE {

nrReconnectCellId-r16 CGI-Info-Logging-r16,

eutraReconnectCellId-r16 CGI-InfoEUTRALogging

} OPTIONAL,

timeUntilReconnection-16 TimeUntilReconnection-16 OPTIONAL,

reestablishmentCellId-r16 CGI-Info-Logging-r16 OPTIONAL,

timeConnFailure-r16 INTEGER (0..1023) OPTIONAL,

timeSinceFailure-r16 TimeSinceFailure-r16,

connectionFailureType-r16 ENUMERATED {rlf, hof},

rlf-Cause-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

beamFailureRecoveryFailure, lbtFailure-r16,

bh-rlfRecoveryFailure, spare2, spare1},

locationInfo-r16 LocationInfo-r16 OPTIONAL,

noSuitableCellFound-r16 ENUMERATED {true} OPTIONAL,

ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

...

},

eutra-RLF-Report-r16 SEQUENCE {

failedPCellId-EUTRA CGI-InfoEUTRALogging,

measResult-RLF-Report-EUTRA-r16 OCTET STRING,

...

}

}

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 MeasResultLogging2NR-r16

MeasResultLogging2NR-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueNR,

measResultListLoggingNR-r16 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

}

MeasResultRLFNR-r16 ::= SEQUENCE {

measResult-r16 SEQUENCE {

cellResults-r16 SEQUENCE{

resultsSSB-Cell-r16 MeasQuantityResults OPTIONAL,

resultsCSI-RS-Cell-r16 MeasQuantityResults OPTIONAL

},

rsIndexResults-r16 SEQUENCE{

resultsSSB-Indexes-r16 ResultsPerSSB-IndexList OPTIONAL,

ssbRLMConfigBitmap-r16 BIT STRING (SIZE (64)) OPTIONAL,

resultsCSI-RS-Indexes-r16 ResultsPerCSI-RS-IndexList OPTIONAL,

csi-rsRLMConfigBitmap-r16 BIT STRING (SIZE (96)) OPTIONAL

} OPTIONAL

}

}

TimeSinceFailure-r16 ::= INTEGER (0..172800)

MobilityHistoryReport-r16 ::= VisitedCellInfoList-r16

TimeUntilReconnection-16 ::= INTEGER (0..172800)

-- TAG-UEINFORMATIONRESPONSE-STOP

-- ASN1STOP

*<Text Omitted>*

|  |
| --- |
| *RA-Report* field descriptions |
| ***absoluteFrequencyPointA***  This field indicates the absolute frequency position of the reference resource block (Common RB 0). |
| ***cellID***  This field indicates the CGI of the PCell if the associated random access procedure was performed on the MCG, or of the PSCell if the associated random access procedure was performed on the SCG |
| ***contentionDetected***  This field is used to indicate that contention was detected for the transmitted preamble in the given random access attempt or not. This field is not included when the UE performs random access attempt is using contention free random-access resources or when the *ra-Purpose* is set to *requestForOtherSI*. |
| ***csi-RS-Index***  This field is used to indicate the CSI-RS index corresponding to the random access attempt. |
| ***dlRSRPAboveThreshold***  This field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold (*rsrp-ThresholdSSB* in *beamFailureRecoveryConfig* in UL BWP configuration of UL BWP selected for random access procedure initiated for beam failure recovery; Otherwise, *rsrp-ThresholdSSB* in *rach-ConfigCommon* in UL BWP configuration of UL BWP selected for random access procedure. |
| ***locationAndBandwidth***  Frequency domain location and bandwidth of the bandwidth part associated to the random-access resources used by the UE. |
| ***numberOfPreamblesSentOnCSI-RS***  This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding CSI-RS. |
| ***numberOfPreamblesSentOnSSB***  This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding SSB/PBCH block. |
| ***perRAAttemptInfoList***  This field provides detailed information about a random access attempt. |
| ***perRAInfoList***  This field provides detailed information about each of the random access attempts in the chronological order of the random access attempts. |
| ***perRACSI-RSInfoList***  This field provides detailed information about the successive random acess attempts associated to the same CSI-RS. |
| ***perRASSBInfoList***  This field provides detailed information about the successive random access attempts associated to the same SS/PBCH block. |
| ***raPurpose***  This field is used to indicate the RA scenario for which the RA report entry is triggered. The RA accesses associated to Initial access from RRC\_IDLE, transition from RRC-INACTIVE and the MSG3 based SI request are indicated using the indicator 'accessRelated'. The indicator *beamFailureRecovery* is used in case of beam failure recovery failure in the SpCell [3]. The indicator *reconfigurationWithSync* is used if the UE executes a reconfiguration with sync. The indicator *ulUnSynchronized* is used if the random access procedure is initiated in a SpCell by DL or UL data arrival during RRC\_CONNECTED when the timeAlignmentTimer is not running in the PTAG or in a serving cell by a PDCCH order [3]. The indicator *schedulingRequestFailure* is used in case of SR failures [3]. The indicator *noPUCCHResourceAvailable* is used when the UE has no valid SR PUCCH resources configured [3]. The indicator *requestForOtherSI* is used for MSG1 based on demand SI request. |
| ***ra-InformationCommon***  This field is used to indicate the common random-access related information between *RA-report* and *RLF-report*. For RA report, this field is mandatory presented. For *RLF-report*, this field is optionally included when c*onnectionFailureType* is set to 'hof' or when *connectionFailureType* is set to 'rlf' and the *rlf-Cause* equals to 'randomAccessProblem' or 'beamRecoveryFailure'; otherwise this field is absent. |
| ***sCellID***  This field is used to indicate the *physCellId* and the *carrierFreq* of the SCell in which the associated random access procedure was performed. |
| ***ssb-Index***  This field is used to indicate the SS/PBCH index of the SS/PBCH block corresponding to the random access attempt. |
| ***subcarrierSpacing***  Subcarrier spacing used in the BWP associated to the random-access resources used by the UE. |

*<Text Omitted>*

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SCellRA* | The field is mandatory present if the random access procedure was performed in the SCell. It is absent otherwise |

*End of changes*

### Proposed changes – company XXX

### Proposed changes – company YYY

## Changes associated to logged MDT correction

*START OF CHANGE*

### 6.2.2 Message definitions

*<Text Omitted>*

#### – *UEInformationResponse*

The *UEInformationResponse* message is used by the UE to transfer information requested by the network.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*UEInformationResponse message*

-- ASN1START

-- TAG-UEINFORMATIONRESPONSE-START

UEInformationResponse-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueInformationResponse-r16 UEInformationResponse-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationResponse-r16-IEs ::= SEQUENCE {

measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

dummyLogMeasReport DummyLogMeasReport OPTIONAL,

connEstFailReport-r16 ConnEstFailReport-r16 OPTIONAL,

ra-ReportList-r16 RA-ReportList-r16 OPTIONAL,

rlf-Report-r16 RLF-Report-r16 OPTIONAL,

mobilityHistoryReport-r16 MobilityHistoryReport-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEInformationResponse-v16xy-IEs OPTIONAL

}

UEInformationResponse-v16xy-IEs ::= SEQUENCE {

logMeasReport-r16 LogMeasReport-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

LogMeasReport-r16 ::= SEQUENCE {

absoluteTimeStamp-r16 AbsoluteTimeInfo-r16,

traceReference-r16 TraceReference-r16,

traceRecordingSessionRef-r16 OCTET STRING (SIZE (2)),

tce-Id-r16 OCTET STRING (SIZE (1)),

logMeasInfoList-r16 LogMeasInfoList-r16,

logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

...

}

LogMeasInfoList-r16 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r16)) OF LogMeasInfo-r16

LogMeasInfo-r16 ::= SEQUENCE {

locationInfo-r16 LocationInfo-r16 OPTIONAL,

relativeTimeStamp-r16 INTEGER (0..7200),

servCellIdentity-r16 CGI-Info-Logging-r16 OPTIONAL,

measResultServingCell-r16 MeasResultServingCell-r16 OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR MeasResultListLogging2NR-r16 OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

anyCellSelectionDetected-r16 ENUMERATED {true} OPTIONAL

}

DummyLogMeasReport ::= SEQUENCE {

absoluteTimeStamp-r16 AbsoluteTimeInfo-r16,

traceReference-r16 TraceReference-r16,

traceRecordingSessionRef-r16 OCTET STRING (SIZE (2)),

tce-Id-r16 OCTET STRING (SIZE (1)),

logMeasInfoList-r16 DummyLogMeasInfoList,

logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

...

}

DummyLogMeasInfoList ::= SEQUENCE (SIZE (1..maxLogMeasReport-r16)) OF DummyLogMeasInfo

DummyLogMeasInfo ::= SEQUENCE {

locationInfo-r16 LocationInfo-r16 OPTIONAL,

relativeTimeStamp-r16 INTEGER (0..7200),

servCellIdentity-r16 CGI-Info-Logging-r16 OPTIONAL,

measResultServingCell-r16 DummyMeasResultServingCell OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR DummyMeasResultListLogging2NR OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

anyCellSelectionDetected-r16 ENUMERATED {true} OPTIONAL

}

ConnEstFailReport-r16 ::= SEQUENCE {

measResultFailedCell-r16 MeasResultFailedCell-r16,

locationInfo-r16 LocationInfo-r16 OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR MeasResultList2NR-r16 OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

numberOfConnFail-r16 INTEGER (1..8),

perRAInfoList-r16 PerRAInfoList-r16,

timeSinceFailure-r16 TimeSinceFailure-r16,

...

}

DummyMeasResultServingCell ::= SEQUENCE {

resultsSSB-Cell MeasQuantityResults,

resultsSSB SEQUENCE{

best-ssb-Index SSB-Index,

best-ssb-Results MeasQuantityResults,

numberOfGoodSSB INTEGER (1..maxNrofSSBs-r16)

} OPTIONAL

}

MeasResultServingCell-r16 ::= SEQUENCE {

resultsSSB-Cell MeasQuantityResults,

resultsSSB SEQUENCE{

best-ssb-Index SSB-Index,

best-ssb-Results MeasQuantityResults,

numberOfGoodSSB INTEGER (0..maxNrofSSBs-r16)

} OPTIONAL

}

MeasResultFailedCell-r16 ::= SEQUENCE {

cgi-Info CGI-Info-Logging-r16,

measResult-r16 SEQUENCE {

cellResults-r16 SEQUENCE{

resultsSSB-Cell-r16 MeasQuantityResults

},

rsIndexResults-r16 SEQUENCE{

resultsSSB-Indexes-r16 ResultsPerSSB-IndexList

}

}

}

RA-ReportList-r16 ::= SEQUENCE (SIZE (1..maxRAReport-r16)) OF RA-Report-r16

RA-Report-r16 ::= SEQUENCE {

cellId-r16 CHOICE {

cellGlobalId-r16 CGI-Info-Logging-r16,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

ra-InformationCommon-r16 RA-InformationCommon-r16,

raPurpose-r16 ENUMERATED {accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized,

schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI,

spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1}

}

RA-InformationCommon-r16 ::= SEQUENCE {

absoluteFrequencyPointA-r16 ARFCN-ValueNR,

locationAndBandwidth-r16 INTEGER (0..37949),

subcarrierSpacing-r16 SubcarrierSpacing,

msg1-FrequencyStart-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msg1-FrequencyStartCFRA-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msg1-SubcarrierSpacing-r16 SubcarrierSpacing OPTIONAL,

msg1-SubcarrierSpacingCFRA-r16 SubcarrierSpacing OPTIONAL,

msg1-FDM-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

msg1-FDMCFRA-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

perRAInfoList-r16 PerRAInfoList-r16

}

PerRAInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAInfo-r16

PerRAInfo-r16 ::= CHOICE {

perRASSBInfoList-r16 PerRASSBInfo-r16,

perRACSI-RSInfoList-r16 PerRACSI-RSInfo-r16

}

PerRASSBInfo-r16 ::= SEQUENCE {

ssb-Index-r16 SSB-Index,

numberOfPreamblesSentOnSSB-r16 INTEGER (1..200),

perRAAttemptInfoList-r16 PerRAAttemptInfoList-r16

}

PerRACSI-RSInfo-r16 ::= SEQUENCE {

csi-RS-Index-r16 CSI-RS-Index,

numberOfPreamblesSentOnCSI-RS-r16 INTEGER (1..200)

}

PerRAAttemptInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAAttemptInfo-r16

PerRAAttemptInfo-r16 ::= SEQUENCE {

contentionDetected-r16 BOOLEAN OPTIONAL,

dlRSRPAboveThreshold-r16 BOOLEAN OPTIONAL,

...

}

RLF-Report-r16 ::= CHOICE {

nr-RLF-Report-r16 SEQUENCE {

measResultLastServCell-r16 MeasResultRLFNR-r16,

measResultNeighCells-r16 SEQUENCE {

measResultListNR-r16 MeasResultList2NR-r16 OPTIONAL,

measResultListEUTRA-r16 MeasResultList2EUTRA-r16 OPTIONAL

} OPTIONAL,

c-RNTI-r16 RNTI-Value,

previousPCellId-r16 CHOICE {

nrPreviousCell-r16 CGI-Info-Logging-r16,

eutraPreviousCell-r16 CGI-InfoEUTRALogging

} OPTIONAL,

failedPCellId-r16 CHOICE {

nrFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-Info-Logging-r16,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

eutraFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-InfoEUTRALogging,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 EUTRA-PhysCellId,

carrierFreq-r16 ARFCN-ValueEUTRA

}

}

},

reconnectCellId-r16 CHOICE {

nrReconnectCellId-r16 CGI-Info-Logging-r16,

eutraReconnectCellId-r16 CGI-InfoEUTRALogging

} OPTIONAL,

timeUntilReconnection-16 TimeUntilReconnection-16 OPTIONAL,

reestablishmentCellId-r16 CGI-Info-Logging-r16 OPTIONAL,

timeConnFailure-r16 INTEGER (0..1023) OPTIONAL,

timeSinceFailure-r16 TimeSinceFailure-r16,

connectionFailureType-r16 ENUMERATED {rlf, hof},

rlf-Cause-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

beamFailureRecoveryFailure, lbtFailure-r16,

bh-rlfRecoveryFailure, spare2, spare1},

locationInfo-r16 LocationInfo-r16 OPTIONAL,

noSuitableCellFound-r16 ENUMERATED {true} OPTIONAL,

ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

...

},

eutra-RLF-Report-r16 SEQUENCE {

failedPCellId-EUTRA CGI-InfoEUTRALogging,

measResult-RLF-Report-EUTRA-r16 OCTET STRING,

...

}

}

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

}

DummyMeasResultListLogging2NR ::= SEQUENCE(SIZE (1..maxFreq)) OF DummyMeasResultLogging2NR

DummyMeasResultLogging2NR ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueNR,

dummyMeasResultListLoggingNR-r16 DummyMeasResultListLoggingNR

}

DummyMeasResultListLoggingNR ::= SEQUENCE (SIZE (1..maxCellReport)) OF DummyMeasResultLoggingNR

DummyMeasResultLoggingNR ::= SEQUENCE {

physCellId-r16 PhysCellId,

resultsSSB-Cell-r16 MeasQuantityResults,

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

}

MeasResultListLogging2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResultLogging2NR-r16

MeasResultLogging2NR-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueNR,

measResultListLoggingNR-r16 MeasResultListLoggingNR-r16

}

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

MeasResultLoggingNR-r16 ::= SEQUENCE {

physCellId-r16 PhysCellId,

resultsSSB-Cell-r16 MeasQuantityResults,

numberOfGoodSSB-r16 INTEGER (0..maxNrofSSBs-r16) OPTIONAL

}

MeasResult2EUTRA-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueEUTRA,

measResultList-r16 MeasResultListEUTRA

}

MeasResultRLFNR-r16 ::= SEQUENCE {

measResult-r16 SEQUENCE {

cellResults-r16 SEQUENCE{

resultsSSB-Cell-r16 MeasQuantityResults OPTIONAL,

resultsCSI-RS-Cell-r16 MeasQuantityResults OPTIONAL

},

rsIndexResults-r16 SEQUENCE{

resultsSSB-Indexes-r16 ResultsPerSSB-IndexList OPTIONAL,

ssbRLMConfigBitmap-r16 BIT STRING (SIZE (64)) OPTIONAL,

resultsCSI-RS-Indexes-r16 ResultsPerCSI-RS-IndexList OPTIONAL,

csi-rsRLMConfigBitmap-r16 BIT STRING (SIZE (96)) OPTIONAL

} OPTIONAL

}

}

TimeSinceFailure-r16 ::= INTEGER (0..172800)

MobilityHistoryReport-r16 ::= VisitedCellInfoList-r16

TimeUntilReconnection-16 ::= INTEGER (0..172800)

-- TAG-UEINFORMATIONRESPONSE-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationResponse-IEs* field descriptions |
| ***logMeasReport***  This field is used to provide the measurement results stored by the UE associated to logged MDT. |
| ***measResultIdleEUTRA***  EUTRA measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***measResultIdleNR***  NR measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***ra-Report***  This field is used to provide the list of RA reports that is stored by the UE for the past upto *maxRAReport-r16* number of successful random access procedues. |
| ***rlf-Report***  This field is used to indicate the RLF report related contents. |

|  |
| --- |
| *LogMeasReport* field descriptions |
| ***absoluteTimeStamp***  Indicates the absolute time when the logged measurement configuration logging is provided, as indicated by NR within *absoluteTimeInfo*. |
| ***anyCellSelectionDetected***  This field is used to indicate the detection of *any cell selection* state, as defined in TS 38.304 [20]. The UE sets this field when performing the logging of measurement results in RRC\_IDLE or RRC\_INACTIVE and there is no suitable cell or no acceptable cell. |
| ***measResultServingCell***  This field refers to the log measurement results taken in the Serving cell. |
| ***numberOfGoodSSB***  Indicates the number of SSBs of a cell that are above the configured *absThreshSS-BlocksConsolidation*. If this field is not included, then it is an indication that the network had not configured *absThreshSS-BlocksConsolidation*. |
| ***relativeTimeStamp***  Indicates the time of logging measurement results, measured relative to the *absoluteTimeStamp*. Value in seconds. |
| ***tce-Id***  Parameter Trace Collection Entity Id: See TS 32.422 [52]. |
| ***timeStamp***  Includes time stamps for the waypoints that describe planned locations for the UE. |
| ***traceRecordingSessionRef***  Parameter Trace Recording Session Reference: See TS 32.422 [52]. |

*END OF CHANGES*

### Proposed changes – company XXX

### Proposed changes – company YYY