**3GPP TSG-RAN2 Meeting # 129bis *R2-250***

**Wuhan, P. R. China, 7 – 11 Apr, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | draftCR | **rev** | - | **Current version:** | 18.4.0 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Introduction of event-triggered measurement reporting for RRC spec | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_Mob\_Ph4-Core | | | | |  | ***Date:*** | | | 2025-04-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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 can be 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | **Agreement#1**: Regarding measurment report event configuration   * During RAN2#126e it was agreed *Support the following LTM events based on beam specific quality of serving cell and candidate cells as the L1 LTM measurement events: eventLTM2/3/4/5*. It has also been agreed that *For LTM event evaluation, TTT, hysteresis for entering/leaving, and/or beam specific (FFS for cell specific) offset can be applied.* . * During RAN2#127, it was agreed that *R19 LTM event triggered measurement configuration can be taken as baseline:*  *Event triggered report config is provided in serving cell config.* * It was further agreed in RAN2#127bis that *For measurement reporting configuration, R18 LTM-CSI-ReportConfig is reused if possible. We can revisit it in the stage 3 if needed* * In addition, during the discusison in RAN1#118bis, it was agreed that *There is no consensus in RAN1 on the support L1-SINR measurement based on CSI-RS for candidate cells* * In R2#129, it was agreed that *For field ltm3-Offset-r19, the granularity is 0.5 dB* * In R2#129, it was agree that *TimeToTrigger and reportInterval of L3 measurement report can be reused. FFS on additional value(s) of reportInterval.*   **Agreement#2**: Regarding the resource configuration   * During RAN2#126, it was agreed that *Support the beam config of both SSB and CSI-RS in L1 measurement resource configuration in LTM config*. * During RAN2#127, , it was agreed that *LTM measurement resource configuration is provided in LTM-config.* * During RAN2#127bis, it was further agreed that *For measurement resource configuration, R18 LTM CSI resource configuration is reused if possible. If CSI-RS resource only IE needs to be defined, we can revisit it in the stage 3*. * During RAN1#120, it was agreed that *a single resource set containing CSI-RS resources corresponding to multiple candidate cells. i.e., the same design as that of SSB in Rel-18 LTM. FFS: how to associate between the measurement CSI-RS resources and candidate cells. explicit or implicit signalling of candidate cells*   **Agreement#3**: During RAN2#127bis, it was agreed that report on leave is supported: *MR can be sent when the leaving condition is met, based on NW configuration*.  **Agreement#4**: During RAN2#127bis, it was agreed that event-triggered periodic report is supported *Event triggered periodic MR can be supported, based on NW configuration.*  **Agreement#5**: Regarding to the report content   * During RAN2#127bis, it is agreed that *MR MAC CE can include up to N beams (FFS whether the beam should satisfy the event or not). N is configurable by NW.* * During RAN2#127bis, it is agreed that *Additional information included in MR MAC CE: The information and quantity of current beam, based on NW configuration.* * During RAN2#128, it is agreed that *For event-triggered L1 LTM measurement reporting, NW controls if the beam(s) not satisfying the event could be reported according to N beams in MR MAC CE*. * During RAN2#129, it is agreed that *The max number of N (included in the MR MAC CE) is the total number of all candidate beams without counting current serving beam.*   **Agreement#6**: During RAN2#127bis, it was agreed that for the new MAC CE for event-trigered measurement report, *NW can configure a dedicated SR configuration for MR MAC CE transmission*  **Agreement#7**: During RAN2#128, it was agreed that *Network can configure which RS type (SSB or CSI-RS) is used for LTM event evaluation.* It was also agreed that *Either CSI-RS or SSB could be configured as candidate beam and the measurement RS of the serving cell beam is determined based on the candidate beam to ensure same RS type, i.e. the RS for current beam of serving cell is same as or QCLed with the QCL RS of the indicated TCI state, according to what is agreed in RAN1*.  **Agreement#8**: During RAN1#, on the use of CSI-RS for beam management, it was agreed that *At least CSI-RS for beam management is supported for L1-RSRP measurement for candidate cell*. This is also clear from the WID.  **Agreement#9**: Regarding the CSI-RS configuration per candidate cell,   * During RAN1#118, it was agreed that *At least periodic CSI-RS is supported for L1-RSRP measurement for candidate cell* * During RAN1#118bis, it was agreed that *In addition to periodic CSI-RS, semi-persistent CSI-RS is supported for candidate cell L1-RSRP measurement for gNB scheduled reporting from RAN1 perspective* * During RAN1#120, it was agreed that *In addition to periodic CSI-RS, semi-persistent CSI-RS is supported for candidate cell L1-RSRP measurement for gNB scheduled reporting from RAN1 perspective* * During RAN1#120, it was also agreed that *There is no RAN1 consensus to support SP CSI-RS for event triggered reporting* * During RAN1#120, it was agreed that *There is no consensus on the support of aperiodic CSI-RS resource for gNB scheduled reporting or event triggered reporting*   **Agreement#10**: During RAN2#129, it was agreed that *Confirm on the previous agreement "For measurement reporting configuration, R18 LTM-CSI-ReportConfig is reused".*  **Agreement#11**: During RAN1#120, multiple agreements have been reached on CSI acqusition on the candiate cell. it needs to be further discussed how CSI configuration for CSI acqusition should be specified.  ===============UDPATE AFTER R2#129b======================  **Agreement12:** Select two values of 20ms and 60ms for the additional values.  **Agreement13:** R1 has agreed on the following for CSI-RS configuation   * *Repetition=off is supported for candidate cell CSI-RS in Rel-19.* * *Repetition=on is not supported for candidate cell CSI-RS in Rel-19*.   **Agreement14**: R1 has agreed on the following for timing refnerece for CSI-RS  *RAN1 assumes the SSB QCLed with CSI-RS is used for timing reference of candidate cell CSI-RS measurement in LTM.*  **Agreement15:** R1 has agreed on the following for CSI-RS resource configuration  *In the resource set configured for candidate cell L1-RSRP measurement, a sequence of candidate cell indices is included together with a sequence of CSI-RS resource indices, where each CSI-RS resource index is associated with one candidate cell index.*  **Agreement16**: R1 has agreed on the following regarding the maximum number of beams can be reported per report config. This reverts the previuous R2 agreement that the maximum number does not include the current beam if it is configured to report.  *Regarding the LS from RAN2 (R1-2501686) the following contents are included in the reply LS.*   * *RAN1 assumes at maximum 16 beams can be reported by a single event triggered reporting*   + *Regardless whether or not the report includes the current beam*   + *Note: The maximum number of beams that can be reported by a UE subject to UE capability is under discussion in RAN*1   **Agreement17**: R1 hs agreed for LTM event 2 for the following. Thus the previous R2 agreement that the RS type for the measurement can be configured should have been reverted.  *For the RS type determination for event triggered reporting with event LTM2,*   * *Alt 1-2: At least one candidate RS shall be configured*   **Agreement18:** R1 has agreed on the following parameters within the L1 parameter list   * *LTM-NZP-CSI-RS-ResourceSet-r19=>already added with the change#2.1* * *resourceType-r19=> added under LTM-CSI-ResourceConfig* * *reportQuantity-r19 => Added under LTM-CSI-ReportConfig*   **Agreement19:** The following has been agreed on the resource config under report config and offsets:   * *In L1 reporting configuration, the UE can be configured with a list of candidate IDs. For each listed candidate ID, the network can configure an offset, this offset applies to all the RSs belong the candidate ID that associated with the reporting configuration (the offset value also includes 0dB); If a candidate ID is not provided in the reporting configuration, it means the UE is not required to measure/evaluate the RSs that belonging to the candidate ID for this event, even if these are configured within the L1 resource configuration (to which the L1 reporting configuration points to).* | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | **Change#1.1**: Add LTM events to the existing CSI report configuration introduced in R18. For event configuration, add TTT, hysteresis and beam specific offset configurations. Clarify for eventLTM3/5, the triggering quantity cannot be based on SINR measurement of CSI-RS based on the RAN1 agreement.  **Change#1.2**: Add within the field description of ltm-offset that the granularity is 0.5dB  **Change#1.3**: Add an FFS on the additional values of the report intervals  **Change#2.1**: Add CSI-RS resource configuration to the field *LTM-CSI-ResourceConfig* introduced in R18  **Change#3**: Add configuration for report on leave  **Change#4**: Add configuration for periodic event triggered measurement report  **Chagne#5.1:** Add the maximum number of beams that can be reported within the MAC CE.  **Chagne#5.2:** Add indication for whether the beams not satisfying the event could be reported as well.  **Chagne#5.3:** Add indication for whether the quality of the current beam can be incldued.  **Change#5.4**: ~~Clarify in the field description of maxmum number of beams that can be reported that the number does not count current serving beams~~.Voided  **Change#6:** Add SR configuration for event-triggered measurement report by MAC CE.  **Change#7:** ~~Add RS type for event LTM 2 evaluation.~~ Voided  **Change#8**: Remove the previous sentence in R18 on the restriction that CSI-RS for beam management cannot be used for L1 measurement for CSI-based report.  **Change#9.1:** Add CSI-RS configuration to LTM per candidate cell configuration.  **Change#9.2:** Clarify in the legacy CSI-RS resource configuratios inside LTM-TCI-Info that when the ltm-NZP-CSI-RS-ResourceConfigToAddModList present inside LTM-Candidate, these legacy fields are absent.  **Change#9.3:** Clarify in the field description for ltm-CSI-ResourceList that semi-persistent NZP-CSI-RS is not applicable for event-triggered measurement report for LTM.  **Change#10**: ~~Clarify that CSI-MeasConfig should only be configured on SpCell if the report type for LTM measurement configured as event triggered~~. Voided  **Change#11**: Add an editor’s NOTE for how CSI report configuration should be specified for CSI acqusition.  **Change#12**: Create a new field for report interval with additional value of 20ms and 60ms.  **Change#13**: clarify in the field description of *repetition* that it can only be configured as off if configured for a LTM candidate.  **Change#14**: Add within the field description that when CSI-RS is present in resource config, SSB should be ignored.  **Change#15**: Clarify the correspondance between CSI-RS and candidate ID, same as R18 SSB.  **Change#16**: the max number of beams can be reported per report config is 16.  **Change#17**: remove the field RStype and the field description in resource config that when LTM2 is configured  **Change#18.1**: Add resourceType-r19 under LTM-CSI-ResourceConfig  **Change#18.2:** Add reportQuantity-r19 under LTM-CSI-ReportConfig  **Change19**: Add candidate ID and offset for LTM3 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The enhancements introduced in R19 for measurements cannot be supported | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.3.2, 6.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.300 CR  TS 38.306 CR  TS 38.321 CR  TS 37.340 CR | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | First version in RAN2#129 as R2-2500805  Second version RAN2#129bis as R2-2502096 | | | | | | | | |

==========================================================CHANGE BEGINS=====================================================

### 6.3.2 Radio resource control information elements

– *CSI-MeasConfig*

The IE *CSI-MeasConfig* is used to configure CSI-RS (reference signals) belonging to the serving cell in which *CSI-MeasConfig* is included, channel state information reports to be transmitted on PUCCH on the serving cell in which *CSI-MeasConfig* is included and channel state information reports on PUSCH triggered by DCI received on the serving cell in which *CSI-MeasConfig* is included. See also TS 38.214 [19], clause 5.2.

***CSI-MeasConfig* information element**

-- ASN1START

-- TAG-CSI-MEASCONFIG-START

CSI-MeasConfig ::= SEQUENCE {

nzp-CSI-RS-ResourceToAddModList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-Resource OPTIONAL, -- Need N

nzp-CSI-RS-ResourceToReleaseList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-ResourceId OPTIONAL, -- Need N

nzp-CSI-RS-ResourceSetToAddModList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSet

OPTIONAL, -- Need N

nzp-CSI-RS-ResourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSetId

OPTIONAL, -- Need N

csi-IM-ResourceToAddModList SEQUENCE (SIZE (1..maxNrofCSI-IM-Resources)) OF CSI-IM-Resource OPTIONAL, -- Need N

csi-IM-ResourceToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-IM-Resources)) OF CSI-IM-ResourceId OPTIONAL, -- Need N

csi-IM-ResourceSetToAddModList SEQUENCE (SIZE (1..maxNrofCSI-IM-ResourceSets)) OF CSI-IM-ResourceSet OPTIONAL, -- Need N

csi-IM-ResourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-IM-ResourceSets)) OF CSI-IM-ResourceSetId OPTIONAL, -- Need N

csi-SSB-ResourceSetToAddModList SEQUENCE (SIZE (1..maxNrofCSI-SSB-ResourceSets)) OF CSI-SSB-ResourceSet OPTIONAL, -- Need N

csi-SSB-ResourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-SSB-ResourceSets)) OF CSI-SSB-ResourceSetId OPTIONAL, -- Need N

csi-ResourceConfigToAddModList SEQUENCE (SIZE (1..maxNrofCSI-ResourceConfigurations)) OF CSI-ResourceConfig

OPTIONAL, -- Need N

csi-ResourceConfigToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-ResourceConfigurations)) OF CSI-ResourceConfigId

OPTIONAL, -- Need N

csi-ReportConfigToAddModList SEQUENCE (SIZE (1..maxNrofCSI-ReportConfigurations)) OF CSI-ReportConfig OPTIONAL, -- Need N

csi-ReportConfigToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-ReportConfigurations)) OF CSI-ReportConfigId

OPTIONAL, -- Need N

reportTriggerSize INTEGER (0..6) OPTIONAL, -- Need M

aperiodicTriggerStateList SetupRelease { CSI-AperiodicTriggerStateList } OPTIONAL, -- Need M

semiPersistentOnPUSCH-TriggerStateList SetupRelease { CSI-SemiPersistentOnPUSCH-TriggerStateList } OPTIONAL, -- Need M

...,

[[

reportTriggerSizeDCI-0-2-r16 INTEGER (0..6) OPTIONAL -- Need R

]],

[[

sCellActivationRS-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxNrofSCellActRS-r17)) OF SCellActivationRS-Config-r17 OPTIONAL, -- Need N

sCellActivationRS-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofSCellActRS-r17)) OF SCellActivationRS-ConfigId-r17 OPTIONAL -- Need N

]],

[[

ltm-CSI-ReportConfigToAddModList-r18 SEQUENCE (SIZE (1..maxNrofLTM-CSI-ReportConfigurations-r18)) OF LTM-CSI-ReportConfig-r18

OPTIONAL, -- Need N

ltm-CSI-ReportConfigToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofLTM-CSI-ReportConfigurations-r18)) OF LTM-CSI-ReportConfigId-r18

OPTIONAL -- Need N

]]

}

-- Editor's NOTE: FFS how report configuraiton for CSI acqusition should be configured. Pending with further R1 progress

-- TAG-CSI-MEASCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***CSI-MeasConfig* field descriptions** |
| ***aperiodicTriggerStateList***  Contains trigger states for dynamically selecting one or more aperiodic and semi-persistent reporting configurations and/or triggering one or more aperiodic CSI-RS resource sets for channel and/or interference measurement (see TS 38.214 [19], clause 5.2.1). |
| ***csi-IM-ResourceSetToAddModList***  Pool of *CSI-IM-ResourceSet* which can be referred to from *CSI-ResourceConfig* or from MAC CEs. |
| ***csi-IM-ResourceToAddModList***  Pool of *CSI-IM-Resource* which can be referred to from *CSI-IM-ResourceSet*. |
| ***§csi-ReportConfigToAddModList***  Configured CSI report settings as specified in TS 38.214 [19] clause 5.2.1.1. |
| ***csi-ResourceConfigToAddModList***  Configured CSI resource settings as specified in TS 38.214 [19] clause 5.2.1.2. |
| ***csi-SSB-ResourceSetToAddModList***  Pool of CSI-SSB-ResourceSet which can be referred to from *CSI-ResourceConfig*. |
| ***ltm-CSI-ReportConfigToAddModList***  Configured CSI report settings for LTM as specified in TS 38.214 [19]. |
| ***nzp-CSI-RS-ResourceSetToAddModList***  Pool of *NZP-CSI-RS-ResourceSet* which can be referred to from *CSI-ResourceConfig* or from MAC CEs. |
| ***nzp-CSI-RS-ResourceToAddModList***  Pool of *NZP-CSI-RS-Resource* which can be referred to from *NZP-CSI-RS-ResourceSet*. |
| ***reportTriggerSize, reportTriggerSizeDCI-0-2***  Size of CSI request field in DCI (bits) (see TS 38.214 [19], clause 5.2.1.5.1). The field *reportTriggerSize* applies to DCI format 0\_1 and the field *reportTriggerSizeDCI-0-2* applies to DCI format 0\_2 (see TS 38.214 [19], clause 5.2.1.5.1). |
| ***scellActivationRS-ConfigToAddModList***  Configured RS for fast SCell activation as specified in TS 38.214 [19] clause 5.2.1.5.3. |

========================================================NEXT CHANGE========================================================

– *ReportConfigNR*

The IE *ReportConfigNR* specifies criteria for triggering of an NR measurement reporting event or of a CHO, CPA or CPC event or of an L2 U2N relay measurement reporting event. For events labelled AN with N equal to 1, 2 and so on, measurement reporting events and CHO, CPA or CPC events are based on cell measurement results, which can either be derived based on SS/PBCH block or CSI-RS.

Event A1: Serving becomes better than absolute threshold;

Event A2: Serving becomes worse than absolute threshold;

Event A3: Neighbour becomes amount of offset better than PCell/PSCell;

Event A4: Neighbour becomes better than absolute threshold;

Event A5: PCell/PSCell becomes worse than absolute threshold1 AND Neighbour/SCell becomes better than another absolute threshold2;

Event A6: Neighbour becomes amount of offset better than SCell;

Event D1: Distance between UE and a reference location *referenceLocation1* becomes larger than configured threshold *distanceThreshFromReference1* and distance between UE and a reference location *referenceLocation2* becomes shorter than configured threshold *distanceThreshFromReference2*;

Event D2: Distance between UE and the serving cell moving reference location determined based on *movingReferenceLocation* and its corresponding satellite ephemeris and epoch time broadcast in *SIB19* becomes larger than configured threshold *distanceThreshFromReference1* and distance between UE and a moving reference location determined based on *referenceLocation* and its corresponding satellite ephemeris and epoch time for the neighbor cell provided in the associated *MeasObjectNR* becomes shorter than configured threshold *distanceThreshFromReference2*;

CondEvent A3: Conditional reconfiguration candidate becomes amount of offset better than PCell/PSCell;

CondEvent A4: Conditional reconfiguration candidate becomes better than absolute threshold where *condEventA4* can also be used for current PSCell (i.e., in case it is configured as candidate PSCell for CondEvent A4 evaluation) for CHO with candidate SCG(s) case;

CondEvent A5: PCell/PSCell becomes worse than absolute threshold1 AND Conditional reconfiguration candidate becomes better than another absolute threshold2;

CondEvent D1: Distance between UE and a reference location *referenceLocation1* becomes larger than configured threshold *distanceThreshFromReference1* and distance between UE and a reference location *referenceLocation2* of conditional reconfiguration candidate becomes shorter than configured threshold *distanceThreshFromReference2*;

CondEvent D2: Distance between UE and the serving cell moving reference location determined based on *movingReferenceLocation* and its corresponding satellite ephemeris and epoch time broadcast in *SIB19* becomes larger than configured threshold *distanceThreshFromReference1* and distance between UE and a moving reference location determined based on *referenceLocation* and its corresponding satellite ephemeris and epoch time for the conditional reconfiguration candidate provided in the associated *MeasObjectNR* becomes shorter than configured threshold *distanceThreshFromReference2*;

CondEvent T1: Time measured at UE becomes more than configured threshold *t1-Threshold* but is less than *t1-Threshold + duration*;

Event X1: Serving L2 U2N Relay UE becomes worse than absolute threshold1 AND NR Cell becomes better than another absolute threshold2;

Event X2: Serving L2 U2N Relay UE becomes worse than absolute threshold;

For event I1, measurement reporting event is based on CLI measurement results, which can either be derived based on SRS-RSRP or CLI-RSSI.

Event I1: Interference becomes higher than absolute threshold;

The reporting events concerning Aerial UE altitude are labelled H*N* with *N* equal to 1 and 2. Additionally, the reporting events concerning Aerial UE altitude and the neighboring cell measurements simultaneously are labelled A*M*H*N* with *M* equal to 3, 4, 5 and *N* equal to 1, 2.

Event H1: Aerial UE altitude becomes higher than a threshold;

Event H2: Aerial UE altitude becomes lower than a threshold;

Event A3H1: Neighbour becomes offset better than SpCell and the Aerial UE altitude becomes higher than a threshold;

Event A3H2: Neighbour becomes offset better than SpCell and the Aerial UE altitude becomes lower than a threshold;

Event A4H1: Neighbour becomes better than threshold1 and the Aerial UE altitude becomes higher than a threshold2;

Event A4H2: Neighbour becomes better than threshold1 and the Aerial UE altitude becomes lower than a threshold2;

Event A5H1: SpCell becomes worse than threshold1 and neighbour becomes better than threshold2 and the Aerial UE altitude becomes higher than a threshold3;

Event A5H2: SpCell becomes worse than threshold1 and neighbour becomes better than threshold2 and the Aerial UE altitude becomes lower than a threshold3.

***ReportConfigNR* information element**

-- ASN1START

-- TAG-REPORTCONFIGNR-START

ReportConfigNR ::= SEQUENCE {

reportType CHOICE {

periodical PeriodicalReportConfig,

eventTriggered EventTriggerConfig,

...,

reportCGI ReportCGI,

reportSFTD ReportSFTD-NR,

condTriggerConfig-r16 CondTriggerConfig-r16,

cli-Periodical-r16 CLI-PeriodicalReportConfig-r16,

cli-EventTriggered-r16 CLI-EventTriggerConfig-r16,

rxTxPeriodical-r17 RxTxPeriodical-r17,

reportOnScellActivation-r18 ReportOnScellActivation-r18

}

}

ReportCGI ::= SEQUENCE {

cellForWhichToReportCGI PhysCellId,

...,

[[

useAutonomousGaps-r16 ENUMERATED {setup} OPTIONAL -- Need R

]]

}

ReportSFTD-NR ::= SEQUENCE {

reportSFTD-Meas BOOLEAN,

reportRSRP BOOLEAN,

...,

[[

reportSFTD-NeighMeas ENUMERATED {true} OPTIONAL, -- Need R

drx-SFTD-NeighMeas ENUMERATED {true} OPTIONAL, -- Need R

cellsForWhichToReportSFTD SEQUENCE (SIZE (1..maxCellSFTD)) OF PhysCellId OPTIONAL -- Need R

]]

}

CondTriggerConfig-r16 ::= SEQUENCE {

condEventId CHOICE {

condEventA3 SEQUENCE {

a3-Offset MeasTriggerQuantityOffset,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

condEventA5 SEQUENCE {

a5-Threshold1 MeasTriggerQuantity,

a5-Threshold2 MeasTriggerQuantity,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

...,

condEventA4-r17 SEQUENCE {

a4-Threshold-r17 MeasTriggerQuantity,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger

},

condEventD1-r17 SEQUENCE {

distanceThreshFromReference1-r17 INTEGER(0.. 65525),

distanceThreshFromReference2-r17 INTEGER(0.. 65525),

referenceLocation1-r17 ReferenceLocation-r17,

referenceLocation2-r17 ReferenceLocation-r17,

hysteresisLocation-r17 HysteresisLocation-r17,

timeToTrigger-r17 TimeToTrigger

},

condEventT1-r17 SEQUENCE {

t1-Threshold-r17 INTEGER (0..549755813887),

duration-r17 INTEGER (1..6000)

},

condEventD2-r18 SEQUENCE {

distanceThreshFromReference1-r18 INTEGER(0.. 65535),

distanceThreshFromReference2-r18 INTEGER(0.. 65535),

hysteresisLocation-r18 HysteresisLocation-r17,

timeToTrigger-r18 TimeToTrigger

}

},

rsType-r16 NR-RS-Type,

...,

[[

nesEvent-r18 ENUMERATED {true} OPTIONAL -- Need R

]]

}

EventTriggerConfig ::= SEQUENCE {

eventId CHOICE {

eventA1 SEQUENCE {

a1-Threshold MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

eventA2 SEQUENCE {

a2-Threshold MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

eventA3 SEQUENCE {

a3-Offset MeasTriggerQuantityOffset,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

eventA4 SEQUENCE {

a4-Threshold MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

eventA5 SEQUENCE {

a5-Threshold1 MeasTriggerQuantity,

a5-Threshold2 MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

eventA6 SEQUENCE {

a6-Offset MeasTriggerQuantityOffset,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

...,

[[

eventX1-r17 SEQUENCE {

x1-Threshold1-Relay-r17 SL-MeasTriggerQuantity-r16,

x1-Threshold2-r17 MeasTriggerQuantity,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger,

useAllowedCellList-r17 BOOLEAN

},

eventX2-r17 SEQUENCE {

x2-Threshold-Relay-r17 SL-MeasTriggerQuantity-r16,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger

},

eventD1-r17 SEQUENCE {

distanceThreshFromReference1-r17 INTEGER(1.. 65525),

distanceThreshFromReference2-r17 INTEGER(1.. 65525),

referenceLocation1-r17 ReferenceLocation-r17,

referenceLocation2-r17 ReferenceLocation-r17,

reportOnLeave-r17 BOOLEAN,

hysteresisLocation-r17 HysteresisLocation-r17,

timeToTrigger-r17 TimeToTrigger

}

]],

[[

eventH1-r18 SEQUENCE {

h1-Threshold-r18 Altitude-r18,

h1-Hysteresis-r18 HysteresisAltitude-r18,

reportOnLeave-r18 BOOLEAN,

timeToTrigger-r18 TimeToTrigger,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventH2-r18 SEQUENCE {

h2-Threshold-r18 Altitude-r18,

h2-Hysteresis-r18 HysteresisAltitude-r18,

reportOnLeave-r18 BOOLEAN,

timeToTrigger-r18 TimeToTrigger,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventA3H1-r18 SEQUENCE {

a3-Offset-r18 MeasTriggerQuantityOffset,

reportOnLeave-r18 BOOLEAN,

a3-Hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

useAllowedCellList-r18 BOOLEAN,

h1-Threshold-r18 Altitude-r18,

h1-Hysteresis-r18 HysteresisAltitude-r18,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventA3H2-r18 SEQUENCE {

a3-Offset-r18 MeasTriggerQuantityOffset,

reportOnLeave-r18 BOOLEAN,

a3-Hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

useAllowedCellList-r18 BOOLEAN,

h2-Threshold-r18 Altitude-r18,

h2-Hysteresis-r18 HysteresisAltitude-r18,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventA4H1-r18 SEQUENCE {

a4-Threshold-r18 MeasTriggerQuantity,

reportOnLeave-r18 BOOLEAN,

a4-Hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

useAllowedCellList-r18 BOOLEAN,

h1-Threshold-r18 Altitude-r18,

h1-Hysteresis-r18 HysteresisAltitude-r18,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventA4H2-r18 SEQUENCE {

a4-Threshold-r18 MeasTriggerQuantity,

reportOnLeave-r18 BOOLEAN,

a4-Hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

useAllowedCellList-r18 BOOLEAN,

h2-Threshold-r18 Altitude-r18,

h2-Hysteresis-r18 HysteresisAltitude-r18,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventA5H1-r18 SEQUENCE {

a5-Threshold1-r18 MeasTriggerQuantity,

a5-Threshold2-r18 MeasTriggerQuantity,

reportOnLeave-r18 BOOLEAN,

a5-Hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

useAllowedCellList-r18 BOOLEAN,

h1-Threshold-r18 Altitude-r18,

h1-Hysteresis-r18 HysteresisAltitude-r18,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventA5H2-r18 SEQUENCE {

a5-Threshold1-r18 MeasTriggerQuantity,

a5-Threshold2-r18 MeasTriggerQuantity,

reportOnLeave-r18 BOOLEAN,

a5-Hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

useAllowedCellList-r18 BOOLEAN,

h2-Threshold-r18 Altitude-r18,

h2-Hysteresis-r18 HysteresisAltitude-r18,

includeAltitudeUE-r18 BOOLEAN,

simulMultiTriggerSingleMeasReport-r18 BOOLEAN

},

eventD2-r18 SEQUENCE {

distanceThreshFromReference1-r18 INTEGER(1.. 65535),

distanceThreshFromReference2-r18 INTEGER(1.. 65535),

reportOnLeave-r18 BOOLEAN,

hysteresisLocation-r18 HysteresisLocation-r17,

timeToTrigger-r18 TimeToTrigger

}

]]

},

rsType NR-RS-Type,

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantityCell MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

reportQuantityRS-Indexes MeasReportQuantity OPTIONAL, -- Need R

maxNrofRS-IndexesToReport INTEGER (1..maxNrofIndexesToReport) OPTIONAL, -- Need R

includeBeamMeasurements BOOLEAN,

reportAddNeighMeas ENUMERATED {setup} OPTIONAL, -- Need R

...,

[[

measRSSI-ReportConfig-r16 MeasRSSI-ReportConfig-r16 OPTIONAL, -- Need R

useT312-r16 BOOLEAN OPTIONAL, -- Need M

includeCommonLocationInfo-r16 ENUMERATED {true} OPTIONAL, -- Need R

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL -- Need M

]],

[[

coarseLocationRequest-r17 ENUMERATED {true} OPTIONAL, -- Need R

reportQuantityRelay-r17 SL-MeasReportQuantity-r16 OPTIONAL -- Need R

]],

[[

numberOfTriggeringCells-r18 INTEGER (2..maxCellReport) OPTIONAL, -- Need R

cellIndividualOffsetList-r18 SEQUENCE (SIZE (1..maxNrofCellMeas)) OF CellIndividualOffsetList-r18 OPTIONAL, -- Need R

eventX1-SD-Threshold1-r18 SL-MeasTriggerQuantity-r16 OPTIONAL, -- Need S

eventX2-SD-Threshold-r18 SL-MeasTriggerQuantity-r16 OPTIONAL, -- Need S

reportOnBestCellChange-r18 ENUMERATED {n1, n2} OPTIONAL, -- Need R

enteringLeavingReport-r18 ENUMERATED {true} OPTIONAL -- Need R

]]

}

PeriodicalReportConfig ::= SEQUENCE {

rsType NR-RS-Type,

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantityCell MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

reportQuantityRS-Indexes MeasReportQuantity OPTIONAL, -- Need R

maxNrofRS-IndexesToReport INTEGER (1..maxNrofIndexesToReport) OPTIONAL, -- Need R

includeBeamMeasurements BOOLEAN,

useAllowedCellList BOOLEAN,

...,

[[

measRSSI-ReportConfig-r16 MeasRSSI-ReportConfig-r16 OPTIONAL, -- Need R

includeCommonLocationInfo-r16 ENUMERATED {true} OPTIONAL, -- Need R

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL, -- Need M

ul-DelayValueConfig-r16 SetupRelease { UL-DelayValueConfig-r16 } OPTIONAL, -- Need M

reportAddNeighMeas-r16 ENUMERATED {setup} OPTIONAL -- Need R

]],

[[

ul-ExcessDelayConfig-r17 SetupRelease { UL-ExcessDelayConfig-r17 } OPTIONAL, -- Need M

coarseLocationRequest-r17 ENUMERATED {true} OPTIONAL, -- Need R

reportQuantityRelay-r17 SL-MeasReportQuantity-r16 OPTIONAL -- Need R

]]

}

NR-RS-Type ::= ENUMERATED {ssb, csi-rs}

MeasReportQuantity ::= SEQUENCE {

rsrp BOOLEAN,

rsrq BOOLEAN,

sinr BOOLEAN

}

MeasRSSI-ReportConfig-r16 ::= SEQUENCE {

channelOccupancyThreshold-r16 RSSI-Range-r16 OPTIONAL -- Need R

}

CLI-EventTriggerConfig-r16 ::= SEQUENCE {

eventId-r16 CHOICE {

eventI1-r16 SEQUENCE {

i1-Threshold-r16 MeasTriggerQuantityCLI-r16,

reportOnLeave-r16 BOOLEAN,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger

},

...

},

reportInterval-r16 ReportInterval,

reportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

maxReportCLI-r16 INTEGER (1..maxCLI-Report-r16),

...

}

CLI-PeriodicalReportConfig-r16 ::= SEQUENCE {

reportInterval-r16 ReportInterval,

reportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantityCLI-r16 MeasReportQuantityCLI-r16,

maxReportCLI-r16 INTEGER (1..maxCLI-Report-r16),

...

}

RxTxPeriodical-r17 ::= SEQUENCE {

rxTxReportInterval-r17 RxTxReportInterval-r17 OPTIONAL, -- Need R

reportAmount-r17 ENUMERATED {r1, infinity, spare6, spare5, spare4, spare3, spare2, spare1},

...

}

RxTxReportInterval-r17 ::= ENUMERATED {ms80,ms120,ms160,ms240,ms320,ms480,ms640,ms1024,ms1280,ms2048,ms2560,ms5120,spare4,spare3,spare2,spare1}

MeasTriggerQuantityCLI-r16 ::= CHOICE {

srs-RSRP-r16 SRS-RSRP-Range-r16,

cli-RSSI-r16 CLI-RSSI-Range-r16

}

MeasReportQuantityCLI-r16 ::= ENUMERATED {srs-rsrp, cli-rssi}

ReportOnScellActivation-r18 ::= SEQUENCE {

rsType-r18 NR-RS-Type,

reportQuantityRS-Indexes-r18 MeasReportQuantity,

maxNrofRS-IndexesToReport-r18 INTEGER (1..maxNrofIndexesToReport),

includeBeamMeasurements-r18 BOOLEAN

}

CellIndividualOffsetList-r18 ::= SEQUENCE {

physCellId-r18 PhysCellId,

cellIndividualOffset-r18 Q-OffsetRangeList,

ssbFrequency-r18 ARFCN-ValueNR OPTIONAL -- Need R

}

-- TAG-REPORTCONFIGNR-STOP

-- ASN1STOP

|  |
| --- |
| ***CondTriggerConfig* field descriptions** |
| ***a3-Offset***  Offset value(s) to be used in NR conditional reconfiguration triggering condition for cond event a3. The actual value is field value \* 0.5 dB. |
| ***a4-Threshold***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR conditional reconfiguration triggering condition for cond event a4. |
| ***a5-Threshold1/ a5-Threshold2***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR conditional reconfiguration triggering condition for cond event a5. In the same *condeventA5*, the network configures the same quantity for the *MeasTriggerQuantity* of the *a5-Threshold1* and for the *MeasTriggerQuantity* of the *a5-Threshold2*. |
| ***condEventId***  Choice of NR conditional reconfiguration event triggered criteria. |
| ***distanceThreshFromReference1, distanceThreshFromReference2***  Distance from a fixed reference location configured with *referenceLocation1* or *referenceLocation2* for *condEventD1*. Distance from a moving reference location determined by the UE based on the serving cell *movingReferenceLocation* broadcast in *SIB19* or *referenceLocation* and the corresponding epoch time and satellite ephemeris configured within the *MeasObjectNR* associated to the event for *condEventD2*. Each step represents 50m. |
| ***duration***  This field is used for defining the leaving condition T1-2 for conditional HO event *condEventT1*. Each step represents 100ms. |
| ***nesEvent***  Indicates the event is a NES-specific CHO event and the event is only considered to be satisfied if indication from lower layers is received indicating the applicability of NES-specific CHO event and the related entry condition(s) is fulfilled. This field can only be configured for *condEventA3*, *condEventA4* or *condEventA5*. This field cannot be configured for CPAC. |
| ***referenceLocation1, referenceLocation2***  The r*eferenceLocation1* is associated to serving cell and *referenceLocation2* is associated to candidate target cell. |
| ***t1-Threshold***  The field counts the number of UTC seconds in 10 ms units since 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Sunday, December 31, 1899 and Monday, January 1, 1900). |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to execute the conditional reconfiguration evaluation. |

|  |
| --- |
| ***ReportConfigNR* field descriptions** |
| ***reportType***  Type of the configured measurement report. In MR-DC, network does not configure report of type *reportCGI* using SRB3. The *condTriggerConfig is* used for CHO, CPA or CPC configuration. |

|  |
| --- |
| ***ReportCGI* field descriptions** |
| ***useAutonomousGaps***  Indicates whether or not the UE is allowed to use autonomous gaps in acquiring system information from the NR neighbour cell. When the field is included, the UE applies the corresponding value for T321. |

|  |
| --- |
| ***EventTriggerConfig* field descriptions** |
| ***a3-Offset/a6-Offset***  Offset value(s) to be used in NR measurement report triggering condition for event a3/a6. The actual value is field value \* 0.5 dB. |
| ***aN-ThresholdM***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR measurement report triggering condition for event number aN. If multiple thresholds are defined for event number aN, the thresholds are differentiated by M. In the same *eventA5*, *eventA5H1, eventA5H2,* the network configures the same quantity for the *MeasTriggerQuantity* of the *a5-Threshold1* and for the *MeasTriggerQuantity* of the *a5-Threshold2*. |
| ***channelOccupancyThreshold***  RSSI threshold which is used for channel occupancy evaluation. |
| ***coarseLocationRequest***  This field is used to request UE to report coarse location information. |
| ***distanceThreshFromReference1, distanceThreshFromReference2***  Distance from a fixed reference location configured with *referenceLocation1* or *referenceLocation2* for *eventD1*. Distance from a moving reference location determined by the UE based on the serving cell *movingReferenceLocation* broadcast in *SIB19* or *referenceLocation* and the corresponding epoch time and satellite ephemeris configured within the *MeasObjectNR* associated to the event for *eventD2*. Each step represents 50m. |
| ***eventId***  Choice of NR event triggered reporting criteria. |
| ***eventXN-SD-Threshold***  Indicates the SD-RSRP threshold value for the serving L2 U2N Relay UE in event *XN* (*N* equals 1 or 2). If this field is not included, the UE considers the SD-RSRP threshold value equals to the one indicated by *x1-Threshold1-Relay*/ *x2-Threshold-Relay*. |
| ***includeAltitudeUE***  This field is used to request UE to report altitude information. |
| ***maxNrofRS-IndexesToReport***  Max number of RS indexes to include in the measurement report for A1-A6 events. |
| ***maxReportCells***  Max number of non-serving cells to include in the measurement report. |
| ***numberOfTriggeringCells***  Indicates the number of cells detected that are required to fulfill an event for a measurement report to be triggered. This field is applicable only for the events concerning neighbor cells, i.e. *eventA3*, *eventA4, eventA5, eventA3H1, eventA3H2, eventA4H1, eventA4H2, eventA5H1, eventA5H2*. |
| ***referenceLocation1, referenceLocation2***  The *referenceLocation1* is associated to serving cell and *referenceLocation2* is associated to neighbour cell. |
| ***reportAddNeighMeas***  Indicates that the UE shall include the best neighbour cells per serving frequency. |
| ***reportAmount***  Number of measurement reports applicable for *eventTriggered* as well as for *periodical* report types. |
| ***reportOnBestCellChange***  Indicates whether the UE shall only send measurement report if the measured best cell (when configured to *n1*) or two best cells (when configured to *n2*) have changed. In this release of the specification, this field is applicable only for the events concerning neighbor cells. This field can only be configured when the value of the field *reportAmount* is set to any other value than *r1*. |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList* or for a L2 U2N Relay UE in *relaysTriggeredList*, as specified in 5.5.4.1.  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met if configured in *eventD1*, *eventD2*, *eventH1*, *eventH2* as specified in 5.5.4.1. |
| ***reportQuantityCell***  The cell measurement quantities to be included in the measurement report. |
| ***reportQuantityRS-Indexes***  Indicates which measurement information per RS index the UE shall include in the measurement report. |
| ***simulMultiTriggerSingleMeasReport***  Indicates when multiple events with the same *eventID* satisfy the measurement report triggering condition(s), whether to consider only the event with the smallest value between the altitude of the UE and the configured altitude threshold. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |
| ***useAllowedCellList***  Indicates whether only the cells included in the allow-list of the associated measObject are applicable as specified in 5.5.4.1. |
| ***useT312***  If value *TRUE* is configured, the UE shall use the timer T312 with the value *t312* as specified in the corresponding *measObjectNR*. If value FALSE is configured, the timer T312 is considered as disabled. Network configures value *TRUE* only if *reportType* is set to *eventTriggered*. |
| ***xN-ThresholdM***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR measurement report triggering condition for event xN. If multiple thresholds are defined for event number xN, the thresholds are differentiated by M. *x1-Threshold1* and *x2-Threshold* indicates the threshold value for the serving L2 U2N Relay UE, *x1-Threshold2* indicates the threshold value for the NR Cells. |

|  |
| --- |
| ***CLI-EventTriggerConfig* field descriptions** |
| ***i1-Threshold***  Threshold value associated to the selected trigger quantity (e.g. SRS-RSRP, CLI-RSSI) to be used in CLI measurement report triggering condition for event i1. |
| ***eventId***  Choice of CLI event triggered reporting criteria. |
| ***maxReportCLI***  Max number of CLI measurement resource to include in the measurement report. |
| ***reportAmount***  *Number* of measurement reports. |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a CLI measurement resource in *srsTriggeredList* or *rssiTriggeredList*, as specified in 5.5.4.1. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |

|  |
| --- |
| ***CLI-PeriodicalReportConfig* field descriptions** |
| ***maxReportCLI***  Max number of CLI measurement resource to include in the measurement report. |
| ***reportAmount***  *Number* of measurement reports. |
| ***reportQuantityCLI***  The CLI measurement quantities to be included in the measurement report. |

|  |
| --- |
| ***PeriodicalReportConfig* field descriptions** |
| ***coarseLocationRequest***  This field is used to request UE to report coarse location information. |
| ***maxNrofRS-IndexesToReport***  Max number of RS indexes to include in the measurement report. |
| ***maxReportCells***  Max number of non-serving cells to include in the measurement report. |
| ***reportAddNeighMeas***  Indicates that the UE shall include the best neighbour cells per serving frequency. |
| ***reportAmount***  *Number* of measurement reports applicable for *eventTriggered* as well as for *periodical* report types |
| ***reportQuantityCell***  The cell measurement quantities to be included in the measurement report. |
| ***reportQuantityRS-Indexes***  Indicates which measurement information per RS index the UE shall include in the measurement report. |
| ***ul-DelayValueConfig***  Indicates that the UE shall perform the actual UL PDCP Packet Average Delay measurement per DRB as specified in TS 38.314 [53] and the UE shall ignore the fields *reportQuantityCell* and *maxReportCells*. The applicable values for the corresponding *reportInterval* are (one of the) {ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1,min6, min12, min30}. The *reportInterval* indicates the periodicity for performing and reporting of UL PDCP Packet Average Delay per DRB measurement as specified in TS 38.314 [53]. |
| ***ul-ExcessDelayConfig***  Indicates that the UE shall perform the actual UL PDCP Excess Packet Delay per DRB measurement as specified in TS 38.314 [53] and the UE shall ignore the fields *reportQuantityCell* and *maxReportCells*. The applicable values for the corresponding *reportInterval* are (one of the) {ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1,min6, min12, min30}. The *reportInterval* indicates the periodicity for performing and reporting of UL PDCP Excess Packet Delay per DRB measurement as specified in TS 38.314 [53]. |
| ***useAllowedCellList***  Indicates whether only the cells included in the allow-list of the associated measObject are applicable as specified in 5.5.4.1. |

|  |
| --- |
| ***ReportSFTD-NR* field descriptions** |
| ***cellForWhichToReportSFTD***  Indicates the target NR neighbour cells for SFTD measurement between PCell and NR neighbour cells. |
| ***drx-SFTD-NeighMeas***  Indicates that the UE shall use available idle periods (i.e. DRX off periods) for the SFTD measurement in NR standalone. The network only includes *drx-SFTD-NeighMeas* field when *reprtSFTD-NeighMeas* is set to true. |
| ***reportSFTD-Meas***  Indicates whether UE is required to perform SFTD measurement between PCell and NR PSCell in NR-DC. |
| ***reportSFTD-NeighMeas***  Indicates whether UE is required to perform SFTD measurement between PCell and NR neighbour cells in NR standalone. The network does not include this field if *reportSFTD-Meas* is set to *true*. |
| ***reportRSRP***  Indicates whether UE is required to include RSRP result of NR PSCell or NR neighbour cells in SFTD measurement result, derived based on SSB. If it is set to true, the network should ensure that *ssb-ConfigMobility* is included in the measurement object for NR PSCell or NR neighbour cells. |

|  |
| --- |
| ***RxTxPeriodical field descriptions*** |
| ***reportAmount***  This field indicates the number of UE Rx-Tx time difference measurement reports. If configured to *r1,* the network does not configure *rxTxReportInterval* and only one measurement is reported. If configured to *infinity*, UE periodically reports measurements according to the periodicity configured by *rxTxReportInterval*. |
| ***rxTxReportInterval***  This field indicates the measurement reporting periodicity of UE Rx-Tx time difference. |

|  |
| --- |
| **otherfield descriptions** |
| ***MeasTriggerQuantity***  SINR is applicable only for CONNECTED mode events. |

|  |
| --- |
| ***ReportOnScellActivation* field descriptions** |
| ***rsType***  Indicates which RS is used to provide the measurement result. Only value *ssb* can be set in this release. |
| ***reportQuantityRS-Indexes***  Indicates which measurement information per RS index is used to sort the reported measurement results and is included in the measurement report. |
| ***maxNrofRS-IndexesToReport***  Max number of RS indexes to include in the measurement report. |
| ***includeBeamMeasurements***  Indicates whether to include the measurement result per RS index in the measurement report. |

|  |
| --- |
| ***CellIndividualOffsetList* field descriptions** |
| ***cellIndividualOffset***  Cell individual offsets applicable to a specific measurement event. If this field is present, the UE, for the same cell, shall ignore the cell individual offset configured within the *MeasObjectNR* of the *measID* associated with this *ReportConfigNR*. |
| ***physCellId***  Physical cell identity of a cell in the cell list. |
| ***ssbFrequency***  Indicates the NR frequency of SS for which *cellIndividualOffset* is applicable. If the field is not configured, the NR frequency of SS indicated by *ssbFrequency* indicated within the *MeasObjectNR* of the *measID* associated with this *ReportConfigNR* applies. |

=========================================================NEXT CHANGE=========================================================

#### – *LTM-Candidate*

The IE *LTM-Candidate* concerns a LTM candidate configuration to add or modify.

*LTM-Candidate* information element

-- ASN1START

-- TAG-LTM-CANDIDATE-START

LTM-Candidate-r18 ::= SEQUENCE {

ltm-CandidateId-r18 LTM-CandidateId-r18,

ltm-CandidatePCI-r18 PhysCellId OPTIONAL, -- Need M

ltm-SSB-Config-r18 LTM-SSB-Config-r18 OPTIONAL, -- Need M

ltm-CandidateConfig-r18 OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL, -- Need M

ltm-ConfigComplete-r18 ENUMERATED {true} OPTIONAL, -- Need R

ltm-EarlyUL-SyncConfig-r18 OCTET STRING (CONTAINING EarlyUL-SyncConfig-r18) OPTIONAL, -- Need R

ltm-EarlyUL-SyncConfigSUL-r18 OCTET STRING (CONTAINING EarlyUL-SyncConfig-r18) OPTIONAL, -- Need R

ltm-TCI-Info-r18 LTM-TCI-Info-r18 OPTIONAL, -- Need M

ltm-NoResetID-r18 INTEGER (1..maxNrofLTM-Configs-plus1-r18) OPTIONAL, -- Need M

ltm-UE-MeasuredTA-ID-r18 INTEGER (1..maxNrofLTM-Configs-plus1-r18) OPTIONAL, -- Need M

...,

[[

ltm-NZP-CSI-RS-ResourceToAddModList-r19 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-Resource

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceToReleaseList-r19 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-ResourceId

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceSetToAddModList-r19 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSet

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceSetToReleaseList-r19 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSetId

OPTIONAL -- Need N

]]

}

LTM-SSB-Config-r18 ::= SEQUENCE {

ssb-Frequency-r18 ARFCN-ValueNR,

subcarrierSpacing-r18 SubcarrierSpacing,

ssb-Periodicity-r18 ENUMERATED {ms5, ms10, ms20, ms40, ms80, ms160, spare2, spare1} OPTIONAL, -- Need R

ssb-PositionsInBurst-r18 CHOICE {

shortBitmap BIT STRING (SIZE (4)),

mediumBitmap BIT STRING (SIZE (8)),

longBitmap BIT STRING (SIZE (64))

} OPTIONAL, -- Need R

ss-PBCH-BlockPower-r18 INTEGER (-60..50) OPTIONAL, -- Need R

...

}

-- TAG-LTM-CANDIDATE-STOP

-- ASN1STOP

|  |
| --- |
| *LTM-Candidate* field descriptions |
| ***ltm-CandidateConfig***  This field includes an RRCReconfiguration message used to configure an LTM candidate configuration. |
| ***ltm-CandidatePCI***  This field identifies the PCI of the SpCell of the LTM candidate configuration contained in *ltm-CandidateConfig*. |
| ***ltm-NZP-CSI-RS-ResourceToAddModList***  Pool of CSI-RS resources sets which can be referred to in *NZP-CSI-RS-ResourceSet*. |
| ***ltm-NZP-CSI-RS-ResourceSetToAddModList***  Pool of CSI-RS resource set which can be referred to in *LTM-CSI-RS-ResourceConfig*. |
| ***ltm-EarlyUL-SyncConfig, ltm-EarlyUL-SyncConfigSUL***  A configuration used to perform the early UL synchronization procedure over an UL or SUL carrier. |
| ***ltm-NoResetID***  If the network configures this field for one LTM candidate configuration, the network configures also for all LTM candidate configurations within *ltm-CandidateToAddModList* in *LTM-Config* and ensures that the UE has stored a value for *ltm-ServingCellNoResetID* within *VarLTM-ServingCellNoResetID*. |
| ***ltm-UE-MeasuredTA-ID***  If the network configures this field for one LTM candidate configuration, the network configures also for all LTM candidate configurations within *ltm-CandidateToAddModList* in *LTM-Config* and ensures that the UE has stored a value for *ltm-ServingCellUE-MeasuredTA-ID* within *VarLTM-ServingCellUE-MeasuredTA-ID*. This field is absent if *tag2* is present for this LTM candidate configuration. |

=========================================================NEXT CHANGE=========================================================

#### – *LTM-CSI-ReportConfig*

The IE *LTM-CSI-ReportConfig* is used to configure gNB-scheduled measurement report on the cell in which the *LTM-CSI-ReportConfig* is included when the field *ltm-ReportConfigType* is configured as *periodic/semi-persistentOnPUCCH/semi-persistentOnPUSCH/aperiodic*.

The IE *LTM-CSI-ReportConfig* is also used to configure event-triggered measurement report when the field *ltm-ReportConfigType* is configured as *eventTriggered*, within which the criteria for triggering measurement report by MAC CE as in TS 38.321 [3] is specified.

Event LTM2: Beam of SpCell becomes worse than absolute threshold;

Event LTM3: Beam of candidate cell becomes amount of offset better than the beam of SpCell;

Event LTM4: Beam of candidate cell becomes better than absolute threshold;

Event LTM5: Beam of SpCell becomes worse than absolute threshold1 AND Beam of candidate cell becomes better than another absolute threshold2.

*LTM-CSI-ReportConfig* information element

-- ASN1START

-- TAG-LTM-CSI-REPORTCONFIG-START

LTM-CSI-ReportConfig-r18 ::= SEQUENCE {

ltm-CSI-ReportConfigId-r18 LTM-CSI-ReportConfigId-r18,

ltm-ResourcesForChannelMeasurement-r18 LTM-CSI-ResourceConfigId-r18,

ltm-ReportConfigType-r18 CHOICE {

periodic-r18 SEQUENCE {

reportSlotConfig-r18 CSI-ReportPeriodicityAndOffset,

pucch-CSI-ResourceList-r18 SEQUENCE (SIZE (1..maxNrofBWPs)) OF PUCCH-CSI-Resource

},

semiPersistentOnPUCCH-r18 SEQUENCE {

reportSlotConfig-r18 CSI-ReportPeriodicityAndOffset,

pucch-CSI-ResourceList-r18 SEQUENCE (SIZE (1..maxNrofBWPs)) OF PUCCH-CSI-Resource

},

semiPersistentOnPUSCH-r18 SEQUENCE {

reportSlotConfig-r18 CSI-ReportPeriodicityAndOffset,

reportSlotOffsetList-r18 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER (0..128),

reportSlotOffsetListDCI-0-2-r18 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER (0..128),

reportSlotOffsetListDCI-0-1-r18 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER (0..128),

p0alpha P0-PUSCH-AlphaSetId

},

aperiodic-r18 SEQUENCE {

reportSlotOffsetList-r18 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER (0..128),

reportSlotOffsetListDCI-0-2-r18 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER (0..128),

reportSlotOffsetListDCI-0-1-r18 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER (0..128)

},

...,

eventTriggered-r19 SEQUENCE {

eventId-r19 CHOICE {

eventLTM2-r19 SEQUENCE {

ltm2-Threshold-r19 MeasTriggerQuantity,

hysteresis-r19 Hysteresis,

timeToTrigger-r19 TimeToTrigger,

...

},

eventLTM3-r19 SEQUENCE {

ltm3-Offset-r19 MeasTriggerQuantityOffset,

hysteresis-r19 Hysteresis,

timeToTrigger-r19 TimeToTrigger,

...

},

eventLTM4-r19 SEQUENCE {

ltm4-Threshold-r19 MeasTriggerQuantity,

hysteresis-r19 Hysteresis,

timeToTrigger-r19 TimeToTrigger,

...

},

eventLTM5-r19 SEQUENCE {

ltm5-Threshold1-r19 MeasTriggerQuantity,

ltm5-Threshold2-r19 MeasTriggerQuantity,

hysteresis-r19 Hysteresis,

timeToTrigger-r19 TimeToTrigger,

...

},

...

},

ltm-CandidateReportConfigList-r19 SEQUENCE (SIZE (1.. maxNrofLTM-Configs-r18)) OF LTM-CandidateReportConfig-r19

OPTIONAL, -- Need R

ltm-EventTriggeredReportContent-r19 LTM-EventTriggeredReportContent-r19,

reportOnLeave-r19 ENUMERATED {enabled, disabled} OPTIONAL, -- Need R

ltm-EventTriggeredPeriodicReport-r19 LTM-EventTriggeredPeriodicReport-r19 OPTIONAL, -- Need S ...

}

},

ltm-ReportContent-r18 LTM-ReportContent-r18,

..., ltm-ReportContent-v19xy LTM-ReportContent-v19xy OPTIONAL, -- Need R

}

LTM-ReportContent-r18 ::= SEQUENCE {

nrOfReportedCells-r18 ENUMERATED {n1,n2,n3,n4},

nrOfReportedRS-PerCell-r18 ENUMERATED {n1,n2,n3,n4},

spCellInclusion-r18 ENUMERATED {true} OPTIONAL -- Need R

}

LTM-EventTriggeredPeriodicReport-r19 ::= SEQUENCE {

reportInterval-r19 ReportInterval-r19,

reportAmount-r19 ENUMERATED {r2, r4, r8, r16, r32, r64, infinity, spare1},

...

}

LTM-EventTriggeredReportContent-r19 ::= SEQUENCE {

maxNumberOfReportedBeams-r19 INTEGER (1..16),

allowReportAnyBeam-r19 ENUMERATED {enabled, disabled},

reportCurrentBeam-r19 ENUMERATED {enabled, disabled},

...}

LTM-CandidateReportConfig-r19 ::= SEQUENCE {

ltm-CandidateReportConfigId-r19 LTM-CandidateId-r18 OPTIONAL, -- Cond notEventLTM2

candidateSpecificOffset-r19 MeasTriggerQuantityOffset OPTIONAL, -- Cond eventLTM3

...

}

LTM-ReportContent-v19xy ::= SEQUENCE {

reportQuantity-r19 ENUMERATED {cri-RSRP, ssb-index-RSRP},

...

}

-- TAG-LTM-CSI-REPORTCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *LTM-CSI-ReportConfig* field descriptions |
| *eventId*  Type of LTM event for triggering event-triggered measurement report as specified in TS 38.321 [3]. |
| ***hysteresis***  Hysteresis when evaluating the entering/leaving conditions for an LTM event. |
| ***ltm-CandidateReportConfigList***  List of report configurations for LTM candidate IDs. |
| ***ltm-EventTriggeredPeriodicReport***  This field indicates when an LTM event is triggered, whether the event-triggered measurement report is sent periodically. When the field is absent, the event-triggered measurement report is sent once, as specified in TS 38.321 [3]. |
| ***ltm-ReportConfigType***  This field specifies how the UE shall report the measurement results for LTM either by gNB-scheduled measurement report or by event-triggered measurement report by MAC CE. |
| ***ltm-ReportContent***  This field defines the content of the LTM L1 measurement report. When the *ltm-ReportConfigType* is set to *eventTriggered*, this field shall be ignored. |
| ***ltm-ResourcesForChannelMeasurement***  This field indicates the index of SSB or CSI-RS in the field *LTM-CSI-ResourceConfig*. |
| ***ltm2-Threshold, ltm4-Threshold, ltm5-Threshold1, ltm5-Threshold2***  Thresholds defined in the entering/leaving conditions for different LTM events. |
| ***ltm3-Offset***  Offset for the entering/leaving condition for event LTM3. The actual value is field value \* 0.5 dB. |
| ***reportOnLeave***  Indicates whether the event-triggered measurement report by MAC CE shall be triggered when leaving condition is satisfied, as specified in TS 38.321 [3]. |
| ***reportSlotConfig***  Periodicity and slot offset (see TS 38.214 [19], clause 5.2.1.4). |
| ***reportSlotOffsetList, reportSlotOffsetListDCI-0-1***, ***reportSlotOffsetListDCI-0-2***  Timing offset Y for semi persistent reporting using PUSCH and aperiodic reporting. |
| ***timeToTrigger***  Time during which an entering/leaving condition needs to be consistently satisfied for triggering event-triggered measurement report by MAC CE as specified in TS 38.321 [3]. |

|  |
| --- |
| *LTM-ReportContent field descriptions* |
| ***nrOfReportedCells***  This field defines how many cells are reported within a single L1 measurement report instance. |
| ***nrOfReportedRS-PerCell***  This field defines how many RSs per cell are reported within a single L1 measurement report instance. |
| ***spCellInclusion***  This field indicates whether the UE shall include a L1 measurement report associated to the current SpCell. This field can only be configured if the current SpCell is configured as an SpCell of an LTM candidate configuration and the *LTM-CSI-ResourceConfig* IE associated to the *LTM-CSI-ReportConfig* IE includes resources for the current SpCell. |
| ***reportQuantity***  Indicates the report quantity for the CSI report. |

|  |
| --- |
| *LTM-* *EventTriggeredReportContent* field descriptions |
| ***allowReportAnyBeam***  Indicates whether the UE shall report the measurement results for the beams not satisfying the conditions of the events as specified in TS 38.321 [3]. |
| ***maxNumberOfReportedBeams***  This field defines number of beams whose measurements can be reported in the event-triggered measurement report by MAC CE as specified in TS 38.321 [3]. |
| *reportCurrentBeam*  Indicates whether the UE shall report the measurement result of the current beam as specified in TS 38.321 [3]. |

|  |
| --- |
| *LTM-EventTriggeredPeriodicReport* field descriptions |
| ***reportInterval***  This field defines the periodicity of the event-triggered periodic measurement report. |
| ***reportAmount***  Number of measurement reports needs to be transmitted after the event is triggered as specified in TS 38.321 [3]. Value 'r2' means the report is sent twice, ’r3’ means the report is sent three times, and so on. |

|  |
| --- |
| *LTM-CandidateReportConfig* field descriptions |
| ***ltm-CandidateReportConfigId***  LTM candidate cell ID for which the UE is required to measure reference signal and perform LTM event evalaution as specified in TS 38.321 [3]. |
| ***candidateSpecificOffset***  Offset for event condition that is applicable for all the reference signals belonging to the candidate cell with the candidate cell ID *ltm-CandidateReportConfigId*. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *notEventLTM2* | This field is not present when the *eventId* is configured as *eventLTM2*. Otherwise, it is optionally present, need R. |
| *eventLTM3* | This field is optionally present when *eventId* is configured as *eventLTM3*, need R. Otherwise, it is absent. |

==========================================================NEXT CHANGE========================================================

#### – *LTM-CSI-ResourceConfig*

The IE *LTM-CSI-ResourceConfig* defines a group of one or more CSI resources for one or more LTM candidate configurations

*LTM-CSI-ResourceConfig* information element

-- ASN1START

-- TAG-LTM-CSI-RESOURCECONFIG-START

LTM-CSI-ResourceConfig-r18 ::= SEQUENCE {

ltm-CSI-ResourceConfigId-r18 LTM-CSI-ResourceConfigId-r18,

ltm-SSB-ResourceSet-r18 LTM-SSB-ResourceSet-r18,

... ,

[[

ltm-NZP-CSI-RS-ResourceSet-r19 LTM-NZP-CSI-RS-ResourceSet-r19 OPTIONAL, -- Need R

resourceType-r19 ENUMERATED {periodic, semi-persistent} OPTIONAL -- Cond CSI-RS

]]

}

LTM-SSB-ResourceSet-r18 ::= SEQUENCE {

ltm-SSB-ResourceList-r18 SEQUENCE (SIZE (1..maxNrofLTM-CSI-ResourcesPerSet-r18)) OF SSB-Index,

ltm-CandidateIdList-r18 SEQUENCE (SIZE (1..maxNrofLTM-CSI-ResourcesPerSet-r18)) OF LTM-CandidateId-r18,

...

}

LTM-NZP-CSI-RS-ResourceSet-r19 ::= SEQUENCE {

ltm-CSI-RS-ResourceList-r19 SEQUENCE (SIZE (1..maxNrofLTM-CSI-ResourcesPerSet-r19)) OF NZP-CSI-RS-ResourceId,

ltm-CandidateIdList-r19 SEQUENCE (SIZE (1..maxNrofLTM-CSI-ResourcesPerSet-r19)) OF LTM-CandidateId-r18,

...

}

-- TAG-LTM-CSI-RESOURCECONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *LTM-CSI -ResourceConfig* field descriptions |
| ***ltm-SSB-ResourceSet***  This field indicates the resource set for LTM measurement based on SSB. |
| ***ltm-CSI-RS-ResourceSet***  This field indicates the resource set for LTM measuremenet based on CSI-RS. When the field is present, the UE shall ignore the field *ltm-SSB-ResourceSet*. |
| ***resourceType***  Indicates the type of resource for LTM measurement. |

|  |
| --- |
| *LTM-SSB-ResourceSet* field descriptions |
| ***ltm-CandidateIdList***  This field indicates the LTM candidate configuration IDs related to the SSBs in the *ltm-SSB-ResourceList*. The list has the same number of entries as *ltm-SSB-ResourceList*. The first entry in this list shall be associated to the first entry in *ltm-SSB-ResourceList*, the second entry of this list shall be associated to the second entry in *ltm-SSB-ResourceList*, and so on. |
| ***ltm-SSB-ResourceList***  This field is used to indicate on SS/PBCH block resources from one or more LTM candidate cells. |

|  |
| --- |
| *LTM-CSI-RS-ResourceSet* field descriptions |
| ***ltm-CandidateIdList***  This field indicates the LTM candidate configuration IDs related to the SSBs in the *ltm-CSI-RS-ResourceList*. The list has the same number of entries as *ltm-CSI-RS-ResourceList*. The first entry in this list shall be associated to the first entry in *ltm-CSI-RS-ResourceList*, the second entry of this list shall be associated to the second entry in *ltm-CSI-RS-ResourceList*, and so on. |
| ***ltm-NZP-CSI-RS-ResourceList***  This field is used to indicate on NZP CSI-RS resources from one or more LTM candidate cells. If the resource type of the NZP-CSI-RS resource is *semi-persistent,* the *ltm-ReportConfigType* within *LTM-CSI-ReportConfig that this* resource set is associated with cannot be configured as *eventTriggered*. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *CSI-RS* | This field is mandatory present, Need R, if the field *ltm-NZP-CSI-RS-ResourceSet-r19* is configured. Otherwise, it is absent. |

==========================================================NEXT CHANGE========================================================

#### – *LTM-TCI-Info*

The IE *LTM-TCI-Info* is used to configure TCI related information for an LTM candidate configuration to be used during activation of TCI state(s) and/or upon the reception of the LTM Cell Switch procedure.

*LTM-TCI-Info* information element

-- ASN1START

-- TAG-LTM-TCI-INFO-START

LTM-TCI-Info-r18 ::= SEQUENCE {

ltm-DL-OrJointTCI-StateToAddModList-r18 SEQUENCE (SIZE (1..maxNrofCandidateTCI-State-r18)) OF CandidateTCI-State-r18

OPTIONAL, -- Need N

ltm-DL-OrJointTCI-StateToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofCandidateTCI-State-r18)) OF TCI-StateId

OPTIONAL, -- Need N

ltm-UL-TCI-StateToAddModList-r18 SEQUENCE (SIZE (1..maxNrofCandidateUL-TCI-r18)) OF CandidateTCI-UL-State-r18

OPTIONAL, -- Need N

ltm-UL-TCI-StateToReleaseList-r18 SEQUENCE (SIZE (1.. maxNrofCandidateUL-TCI-r18)) OF TCI-UL-StateId-r17

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceToAddModList-r18 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-Resource

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-ResourceId

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceSetToAddModList-r18 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSet

OPTIONAL, -- Need N

ltm-NZP-CSI-RS-ResourceSetToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSetId

OPTIONAL, -- Need N

pathlossReferenceRS-ToAddModList-r18 SEQUENCE (SIZE (1..maxNrofPathlossReferenceRSs-r17)) OF PathlossReferenceRS-r17

OPTIONAL, -- Need N

pathlossReferenceRS-ToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofPathlossReferenceRSs-r17)) OF PathlossReferenceRS-Id-r17

OPTIONAL, -- Need N

unifiedTCI-StateType-r18 ENUMERATED {separate, joint} OPTIONAL, -- Need R

...

}

-- TAG-LTM-TCI-INFO-STOP

-- ASN1STOP

|  |
| --- |
| *LTM-TCI-Info* field descriptions |
| ***unifiedTCI-StateType***  Indicates the unified TCI states type the UE is configured for this LTM candidate configuration. The value *separate* means this LTM candidate configuration is configured with *ltm-DL-OrJointTCI-StateToAddModList* for DL TCI states and *ltm-UL-TCI-StateToAddModList* for UL TCI states. The value *joint* means this LTM candidate configuration is configured with *ltm-DL-OrJointTCI-StateToAddModList* for joint TCI states for UL and DL operation. The network always configures this field. |
| ***ltm-NZP-CSI-RS-ResourceToAddModList***  List of NZP CSI RS resources configured for TCI state indication. When the field *ltm-NZP-CSI-RS-ResourceToAddModList* is present under *LTM-Candidate*, this field is absent |
| ***ltm-NZP-CSI-RS-ResourceSetToAddModList***  List of NZP CSI RS resource sets configured for TCI state indication. When the field *ltm-NZP-CSI-RS-ResourceSetToAddModList* is present under *LTM-Candidate*, this field is absent |

==========================================================NEXT CHANGE========================================================

#### – *MAC-CellGroupConfig*

The IE *MAC-CellGroupConfig* is used to configure MAC parameters for a cell group, including DRX.

*MAC-CellGroupConfig* information element

-- ASN1START

-- TAG-MAC-CELLGROUPCONFIG-START

MAC-CellGroupConfig ::= SEQUENCE {

drx-Config SetupRelease { DRX-Config } OPTIONAL, -- Need M

schedulingRequestConfig SchedulingRequestConfig OPTIONAL, -- Need M

bsr-Config BSR-Config OPTIONAL, -- Need M

tag-Config TAG-Config OPTIONAL, -- Need M

phr-Config SetupRelease { PHR-Config } OPTIONAL, -- Need M

skipUplinkTxDynamic BOOLEAN,

...,

[[

csi-Mask BOOLEAN OPTIONAL, -- Need M

dataInactivityTimer SetupRelease { DataInactivityTimer } OPTIONAL -- Cond MCG-Only

]],

[[

usePreBSR-r16 ENUMERATED {true} OPTIONAL, -- Need R

schedulingRequestID-LBT-SCell-r16 SchedulingRequestId OPTIONAL, -- Need R

lch-BasedPrioritization-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

schedulingRequestID-BFR-SCell-r16 SchedulingRequestId OPTIONAL, -- Need R

drx-ConfigSecondaryGroup-r16 SetupRelease { DRX-ConfigSecondaryGroup-r16 } OPTIONAL -- Need M

]],

[[

enhancedSkipUplinkTxDynamic-r16 ENUMERATED {true} OPTIONAL, -- Need R

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

]],

[[

intraCG-Prioritization-r17 ENUMERATED {enabled} OPTIONAL, -- Cond LCH-PrioWithReTxTimer

drx-ConfigSL-r17 SetupRelease { DRX-ConfigSL-r17 } OPTIONAL, -- Need M

drx-ConfigExt-v1700 SetupRelease { DRX-ConfigExt-v1700 } OPTIONAL, -- Need M

schedulingRequestID-BFR-r17 SchedulingRequestId OPTIONAL, -- Need R

schedulingRequestID-BFR2-r17 SchedulingRequestId OPTIONAL, -- Need R

schedulingRequestConfig-v1700 SchedulingRequestConfig-v1700 OPTIONAL, -- Need M

tar-Config-r17 SetupRelease { TAR-Config-r17 } OPTIONAL, -- Need M

g-RNTI-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxG-RNTI-r17)) OF MBS-RNTI-SpecificConfig-r17 OPTIONAL, -- Need N

g-RNTI-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxG-RNTI-r17)) OF MBS-RNTI-SpecificConfigId-r17 OPTIONAL, -- Need N

g-CS-RNTI-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxG-CS-RNTI-r17)) OF MBS-RNTI-SpecificConfig-r17 OPTIONAL, -- Need N

g-CS-RNTI-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxG-CS-RNTI-r17)) OF MBS-RNTI-SpecificConfigId-r17 OPTIONAL, -- Need N

allowCSI-SRS-Tx-MulticastDRX-Active-r17 BOOLEAN OPTIONAL -- Need M

]],

[[

schedulingRequestID-PosMG-Request-r17 SchedulingRequestId OPTIONAL, -- Need R

drx-LastTransmissionUL-r17 ENUMERATED {enabled} OPTIONAL -- Need R

]],

[[

posMG-Request-r17 ENUMERATED {enabled} OPTIONAL -- Need R

]],

[[

drx-ConfigExt2-v1800 SetupRelease { DRX-ConfigExt2-v1800 } OPTIONAL, -- Need M

additionalBS-TableAllowed-r18 BIT STRING (SIZE (maxNrofLCGs-r18)) OPTIONAL, -- Need R

dsr-ConfigToAddModList-r18 SEQUENCE (SIZE (1..maxNrofLCGs-r18)) OF LCG-DSR-Config-r18 OPTIONAL, -- Need N

dsr-ConfigToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofLCGs-r18)) OF LCG-Id-r18 OPTIONAL, -- Need N

tar-Config-r18 SetupRelease { TAR-Config-r18 } OPTIONAL -- Need M

]],

schedulingRequestID-LTM-r19 SchedulingRequestId OPTIONAL -- Need R}

DataInactivityTimer ::= ENUMERATED {s1, s2, s3, s5, s7, s10, s15, s20, s40, s50, s60, s80, s100, s120, s150, s180}

MBS-RNTI-SpecificConfig-r17 ::= SEQUENCE {

mbs-RNTI-SpecificConfigId-r17 MBS-RNTI-SpecificConfigId-r17,

groupCommon-RNTI-r17 CHOICE {

g-RNTI RNTI-Value,

g-CS-RNTI RNTI-Value

},

drx-ConfigPTM-r17 SetupRelease { DRX-ConfigPTM-r17 } OPTIONAL, -- Need M

harq-FeedbackEnablerMulticast-r17 ENUMERATED {dci-enabler, enabled} OPTIONAL, -- Need S

harq-FeedbackOptionMulticast-r17 ENUMERATED {ack-nack, nack-only} OPTIONAL, -- Cond HARQFeedback

pdsch-AggregationFactor-r17 ENUMERATED {n2, n4, n8} OPTIONAL -- Cond G-RNTI

}

MBS-RNTI-SpecificConfigId-r17 ::= INTEGER (0..maxG-RNTI-1-r17)

LCG-DSR-Config-r18 ::= SEQUENCE {

lcg-Id-r18 LCG-Id-r18,

remainingTimeThreshold-r18 INTEGER (1..64),

...

}

LCG-Id-r18 ::= INTEGER (0..maxLCG-ID)

-- TAG-MAC-CELLGROUPCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *MAC-CellGroupConfig* field descriptions |
| ***additionalBS-TableAllowed***  Indicates whether a UE is allowed to utilize the refined buffer size levels, as specified in TS 38.321 [3], for a certain Logical Channel Group. The leftmost bit corresponds to LCG ID=0, second leftmost bit to LCG ID=1 and so on. The UE is allowed to utilize the refined buffer size levels for a Logical Channel Group only when the corresponding bit is set to 1. |
| ***allowCSI-SRS-Tx-MulticastDRX-Active***  Used to control the CSI/SRS transmission during MBS multicast DRX ActiveTime, see TS 38.321 [3]. |
| ***csi-Mask***  If set to true, the UE limits CSI reports to the on-duration period of the DRX cycle, see TS 38.321 [3]. |
| ***dataInactivityTimer***  Releases the RRC connection upon data inactivity as specified in clause 5.3.8.5 and in TS 38.321 [3]. Value *s1* corresponds to 1 second, value s2 corresponds to 2 seconds, and so on. |
| ***drx-Config, drx-ConfigExt, drx-ConfigExt2***  Used to configure DRX as specified in TS 38.321 [3]. Network only configures *drx-ConfigExt* or *drx-ConfigExt2* when *drx-Config* is configured. |
| ***drx-ConfigSecondaryGroup***  Used to configure DRX related parameters for the second DRX group as specified in TS 38.321 [3]. The network does not configure secondary DRX group with DCP simultaneously nor secondary DRX group with a dormant BWP simultaneously. |
| ***drx-ConfigSL***  Used to configure additional DRX parameters for the UE performing sidelink operation with resource allocation mode 1, as specified in TS 38.321 [3]. Network only configures this field if *sl-ScheduledConfig* is configured and *drx-Config* is configured. |
| ***drx-LastTransmissionUL***  If this field is present, the start of the *drx-HARQ-RTT-TimerUL* is after the last transmission within a bundle, see TS 38.321 [3]. |
| ***dsr-ConfigToAddModList***  List of LCG-specific DSR configurations to add or modify. |
| ***dsr-ConfigToReleaseList***  List of LCG-specific DSR configurations to release. |
| ***g-RNTI-ConfigToAddModList***  List of G-RNTI configurations to add or modify. Up to 8 G-RNTIs can be configured in total in this release based on the UE capability. |
| ***g-RNTI-ConfigToReleaseList***  List of G-RNTI configurations to release. |
| ***g-CS-RNTI-ConfigToAddModList***  List of G-CS-RNTI configurations to add or modify. Up to 8 G-CS-RNTIs can be configured in total in this release based on the UE capability. |
| ***g-CS-RNTI-ConfigToReleaseList***  List of G-CS-RNTI configurations to release. |
| ***intraCG-Prioritization***  Used to enable HARQ process ID selection based on LCH-priority for one CG as specified in TS 38.321 [3]. |
| ***lch-BasedPrioritization***  If this field is present, the corresponding MAC entity of the UE is configured with prioritization between overlapping grants and between scheduling request and overlapping grants based on LCH priority, see TS 38.321 [3]. The network does not configure *lch-BasedPrioritization* with *enhancedSkipUplinkTxDynamic* simultaneously nor *lch-BasedPrioritization* with *enhancedSkipUplinkTxConfigured* simultaneously. |
| ***posMG-Request***  Indicates whether UE is configured to send UL MAC CE for Positioning Measurement Gap Activation/Deactivation Request, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR-SCell***  Indicates the scheduling request configuration applicable for BFR on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR***  Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in *failureDetectionSet1* of a serving cell while beam failure is not detected on resources configured in *failureDetectionSet2* of the same serving cell. |
| ***schedulingRequestID-BFR2***  Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in *failureDetectionSet2* of a serving cell while beam failure is not detected on resources configured in *failureDetectionSet1* of the same serving cell. |
| ***schedulingRequestID-LBT-SCell***  Indicates the scheduling request configuration applicable for consistent uplink LBT recovery on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-LTM***  Scheduling request configuration applicable for event-triggered measurement report by MAC CE, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-PosMG-Request***  Indicates the scheduling request configuration applicable for Positioning Measurement Gap Activation/Deactivation Request, as specified in TS 38.321 [3]. |
| ***skipUplinkTxDynamic, enhancedSkipUplinkTxDynamic, enhancedSkipUplinkTxConfigured***  If set to *true*, the UE skips UL transmissions as described in TS 38.321 [3]. If the UE is configured with *enhancedSkipUplinkTxDynamic* or *enhancedSkipUplinkTxConfigured* with value *true*, REPETITION\_NUMBER (as specified in TS 38.321 [3], clause 5.4.2.1) of the corresponding PUSCH transmission of the uplink grant shall be equal to 1. The network does not configure *enhancedSkipUplinkTxDynamic* or *enhancedSkipUplinkTxConfigured* with value *true* together with *numberOfSlotsTBoMS-r17*. |
| ***tag-Config***  The field is used to configure parameters for a time-alignment group. The field is not present if any DAPS bearer is configured. |
| ***usePreBSR***  If set to true, the MAC entity of the IAB-MT may use the Pre-emptive BSR, see TS 38.321 [3]. |

|  |
| --- |
| *MBS-RNTI-SpecificConfig* field descriptions |
| ***drx-ConfigPTM***  Used to configure DRX for PTM transmission as specified in TS 38.321 [3]. |
| ***g-CS-RNTI***  Used to scramble the SPS group-common PDSCH and activation/deactivation of SPS group-common PDSCH for one or more MBS multicast services. |
| ***g-RNTI***  Used to scramble the scheduling and transmission of PTM for one or more MBS multicast services. |
| ***groupCommon-RNTI***  Used to configure g-RNTI or g-CS-RNTI. |
| ***harq-FeedbackEnablerMulticast***  Indicates whether the UE shall provide HARQ feedback for MBS multicast. Value *dci-enabler* means that whether the UE shall provide HARQ feedback for MBS multicast is indicated by DCI as specified in TS 38.213 [13]. Value *enabled* means the UE shall always provide HARQ feedback for MBS multicast. When the field is absent, the UE behavior is specified in TS 38.213 [13]. |
| ***harq-FeedbackOptionMulticast***  Indicates the feedback mode for MBS multicast dynamically scheduled PDSCH or SPS PDSCH. |
| ***mbs-RNTI-SpecificConfigId***  An identifier of the RNTI specific configuration for MBS multicast. |
| ***pdsch-AggregationFactor***  Number of repetitions for dynamically scheduled MBS multicast data (see TS 38.214 [19], clause 5.1.2.1). When the field is absent and *groupCommon-RNTI* is set to *g-RNTI*, the UE applies the value 1. |

|  |
| --- |
| *LCG-DSR-Config* field descriptions |
| ***lcg-Id***  Identifier of the Logical Channel Group which the DSR configuration refers to. |
| ***remainingTimeThreshold***  Remaining time threshold used for triggering DSR for the logical channels belonging to this Logical Channel Group, as specified in TS 38.321 [3]. Value in number of milliseconds. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *G-RNTI* | This field is optionally present, Need S, if *groupCommon-RNTI* is set to *g-RNTI*. The field is absent when *groupCommon-RNTI* is set to *g-CS-RNTI*. |
| *HARQFeedback* | The field is mandatory present when *harq-FeedbackEnablerMulticast* is present. It is absent otherwise. |
| *MCG-Only* | This field is optionally present, Need M, for the *MAC-CellGroupConfig* of the MCG. It is absent otherwise. |
| *LCH-PrioWithReTxTimer* | This field is optionally present, Need R, if lch-BasedPrioritization-r16 is configured in this MAC entity and cg-RetransmissionTimer-r16 is configured for any configured grant configuration associated with this MAC entity. It is absent otherwise, Need R. |

==========================================================NEXT CHANGE========================================================

#### *- MeasTriggerQuantity*

Measurement quantity defined in the measurement report configurations (e.g., events defined in *ReportConfig-NR*, or *LTM-CSI-ReportConfig*) for triggering measurement reports (e.g., by RRC message *MeasurementReport* or by MAC CE in TS 38.321 [3]). When the IE is configured under *LTM-CSI-ReportConfig*, only the field *rsrp* is applicable.

-- ASN1START

-- TAG-MEASTRIGGERQUANTITY-START

MeasTriggerQuantity ::= CHOICE {

rsrp RSRP-Range,

rsrq RSRQ-Range,

sinr SINR-Range

}

-- TAG-MEASTRIGGERQUANTITY-STOP

-- ASN1STOP

==========================================================NEXT CHANGE========================================================

#### *- MeasTriggerQuantityOffset*

Offsets defined in measurement report configurations (e.g., events defined in *ReportConfig-NR*, or *LTM-CSI-ReportConfig*) for triggering measurement reports (e.g., by RRC message *MeasurementReport* or by MAC CE in TS 38.321 [3]). Values in the unit of 'dB'. When the IE is configured under *LTM-CSI-ReportConfig*, only the field *rsrp* is applicable.

-- ASN1START

-- TAG-MEASTRIGGERQUANTITYOFFSET-START

MeasTriggerQuantityOffset ::= CHOICE {

rsrp INTEGER (-30..30),

rsrq INTEGER (-30..30),

sinr INTEGER (-30..30)

}

-- TAG-MEASTRIGGERQUANTITYOFFSET-STOP

-- ASN1STOP

==========================================================NEXT CHANGE========================================================

– *NZP-CSI-RS-ResourceSet*

The IE *NZP-CSI-RS-ResourceSet* is a set of Non-Zero-Power (NZP) CSI-RS resources (their IDs) and set-specific parameters.

***NZP-CSI-RS-ResourceSet* information element**

-- ASN1START

-- TAG-NZP-CSI-RS-RESOURCESET-START

NZP-CSI-RS-ResourceSet ::= SEQUENCE {

nzp-CSI-ResourceSetId NZP-CSI-RS-ResourceSetId,

nzp-CSI-RS-Resources SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourcesPerSet)) OF NZP-CSI-RS-ResourceId,

repetition ENUMERATED { on, off } OPTIONAL, -- Need S

aperiodicTriggeringOffset INTEGER(0..6) OPTIONAL, -- Need S

trs-Info ENUMERATED {true} OPTIONAL, -- Need R

...,

[[

aperiodicTriggeringOffset-r16 INTEGER(0..31) OPTIONAL -- Need S

]],

[[

pdc-Info-r17 ENUMERATED {true} OPTIONAL, -- Need R

cmrGroupingAndPairing-r17 CMRGroupingAndPairing-r17 OPTIONAL, -- Need R

aperiodicTriggeringOffset-r17 INTEGER (0..124) OPTIONAL, -- Need S

aperiodicTriggeringOffsetL2-r17 INTEGER(0..31) OPTIONAL -- Need R

]],

[[

resourceType-r18 ENUMERATED {periodic} OPTIONAL -- Cond LTM

]]

}

CMRGroupingAndPairing-r17 ::= SEQUENCE {

nrofResourcesGroup1-r17 INTEGER (1..7),

pair1OfNZP-CSI-RS-r17 NZP-CSI-RS-Pairing-r17 OPTIONAL, -- Need R

pair2OfNZP-CSI-RS-r17 NZP-CSI-RS-Pairing-r17 OPTIONAL -- Need R

}

NZP-CSI-RS-Pairing-r17 ::= SEQUENCE {

nzp-CSI-RS-ResourceId1-r17 INTEGER (1..7),

nzp-CSI-RS-ResourceId2-r17 INTEGER (1..7)

}

-- TAG-NZP-CSI-RS-RESOURCESET-STOP

-- ASN1STOP

|  |
| --- |
| ***NZP-CSI-RS-ResourceSet* field descriptions** |
| ***aperiodicTriggeringOffset, aperiodicTriggeringOffset-r16, aperiodicTriggeringOffset-r17***  Offset X between the slot containing the DCI that triggers a set of aperiodic NZP CSI-RS resources and the slot in which the CSI-RS resource set is transmitted. For *aperiodicTriggeringOffset*, the value 0 corresponds to 0 slots, value 1 corresponds to 1 slot, value 2 corresponds to 2 slots, value 3 corresponds to 3 slots, value 4 corresponds to 4 slots, value 5 corresponds to 16 slots, value 6 corresponds to 24 slots. For *aperiodicTriggeringOffset-r16* and *aperiodicTriggeringOffset-r17*, the value indicates the number of slots. *aperiodicTriggeringOffset-r17* is applicable to SCS 480 kHz and 960 kHz, and only the values of integer multiples of 4 are valid, i.e. 0, 4, 8, and so on. The network configures only one of the fields. When neither field is included, the UE applies the value 0. This field is not present in case *NZP-CSI-RS-ResourcesSet* is received as part of an *LTM-Candidate* IE. |
| ***aperiodicTriggeringOffsetL2***  Indicates triggering offset of aperiodic NZP CSI-RS resources used for fast activation of the SCell (see clause 5.2.1.5.3 of TS 38.214 [19]), when the NZP CSI-RS resources are activated by the MAC CE (see clause 5.9 of TS 38.321 [3]). The value indicates the number of slots. This field is not present in case *NZP-CSI-RS-ResourcesSet* is received as part of an *LTM-Candidate* IE. |
| ***cmrGroupingAndPairing***  Configures CMR groups and pairs. The first *nrofResourcesGroup1* resources in the NZP-CSI-RS resource set belong to Group 1 and the remaining resources in the NZP-CSI-RS resource set belong to Group 2. *nrofResourcesGroup1* is and the number of remaining resources in the NZP-CSI-RS resource set belonging to Group 2 is as specified in TS 38.214 clause 5.2.1.4.1. Maximum total number in Group 1 and Group 2 is 8 (see TS 38.214 [19], clauses 5.2.1.4.1 and 5.2.1.4.2). This field is not present in case *NZP-CSI-RS-ResourcesSet* is received as part of an *LTM-Candidate* IE. |
| ***pair1OfNZP-CSI-RS, pair2OfNZP-CSI-RS***  A pair of NZP CSI-RS resources. In one pair, one resource shall belong to group 1 and the other resource shall belong to group 2 (see TS 38.214 [19], clause 5.2.1.4.1). |
| ***nzp-CSI-RS-Resources***  NZP-CSI-RS-Resources associated with this NZP-CSI-RS resource set (see TS 38.214 [19], clause 5.2). For CSI, there are at most 8 NZP CSI RS resources per resource set. If the *NZP-CSI-RS-ResourceSet* is indicated in a *CSI-ResourceConfig* indicated by *resourcesForChannelMeasurement* in a *CSI-ReportConfig*, if the *codebookType* in the *codebookConfig* in the *CSI-ReportConfig* is *typeII-Doppler-r18* or *typeII-DopplerPortSelection-r18*, there are at most 1 periodic or semi-persistent NZP CSI-RS resource and 4, 8 or 12 aperiodic NZP CSI-RS resources and if the *codebookType* is *typeII-CJT-r18* or *typeII-CJT-PortSelection-r18*, there are 1, 2, 3, or 4 aperiodic, periodic or semi-persistent NZP-CSI-RS resources, see TS 38.214 5.2.1.4. |
| ***nzp-CSI-RS-ResourceId1, nzp-CSI-RS-ResourceId2***  The *nzp-CSI-RS-ResourceId1-r17* represents the index of the NZP CSI-RS resource in Resource Group 1, and *nzp-CSI-RS-ResourceId2-r17* represents the index of the NZP CSI-RS resource in Resource Group 2. |
| ***pdc-Info***  Indicates that this NZP-CSI-RS-ResourceSet, if configured also with *trs-Info,* is used for propagation delay compensation. The field can be present only if *trs-info* is present. The field can be present in only one *NZP-CSI-RS-ResourceSet*. If network configures this field for an *NZP-CSI-RS-ResourceSet*, the UE measures the UE Rx-Tx time difference based on resources configured in this resource set. This field is not present in case *NZP-CSI-RS-ResourcesSet* is received as part of an *LTM-Candidate* IE. |
| ***repetition***  Indicates whether repetition is on/off. If the field is set to *off* or if the field is absent, the UE may not assume that the NZP-CSI-RS resources within the resource set are transmitted with the same downlink spatial domain transmission filter (see TS 38.214 [19], clauses 5.2.2.3.1 and 5.1.6.1.2). It can only be configured for CSI-RS resource sets which are associated with *CSI-ReportConfig* with report of L1 RSRP, L1 SINR or "no report". If *NZP-CSI-RS-ResourceSet* if configured under *LTM-Candidate*, the field can only be configured as *off*, if present. |
| ***resourceType***  Time domain behavior of resource configuration (see TS 38.214 [19], clause 5.2.1.2). |
| ***trs-Info***  Indicates that the antenna port for all NZP-CSI-RS resources in the CSI-RS resource set is same. If the field is absent or released the UE applies the value *false* (see TS 38.214 [19], clause 5.2.2.3.1). |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *LTM* | The field is optionally present, Need R, in an *LTM-TCI-Info* IE. Otherwise, the field is absent. |

=====================================================NEXT CHANGE============================================================

#### – *ReportInterval*

The IE *ReportInterval* indicates the interval between periodical reports. The *ReportInterval* is applicable if the UE performs periodical reporting (i.e. when *reportAmount* exceeds 1) when *reportType* is set to either *eventTriggered*, *periodical*, *cli-EventTriggered* or *cli-Periodical*. Value *ms120* corresponds to 120 ms, value *ms240* corresponds to 240 ms and so on, while value *min1* corresponds to 1 min, *min6* corresponds to 6 min and so on.

*ReportInterval* information element

-- ASN1START

-- TAG-REPORTINTERVAL-START

ReportInterval ::= ENUMERATED {ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960,

min1,min6, min12, min30 }

ReportInterval-r19 ::= ENUMERATED {ms20, ms60, ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960,

min1,min6, min12, min30 }

-- TAG-REPORTINTERVAL-STOP

-- ASN1STOP

======================================================NEXT CHANGE============================================================

#### – *TimeToTrigger*

The IE *TimeToTrigger* specifies the value range used for time to trigger parameter, which concerns the time during which specific criteria for the event needs to be met in order to trigger a measurement report either by the RRC message *MeasurementReport* or by MAC CE in TS 38.321 [3]. Value *ms0* corresponds to 0 ms and behaviour as specified in 7.1.2 applies, value *ms40* corresponds to 40 ms, and so on.*TimeToTrigger* information element

-- ASN1START

-- TAG-TIMETOTRIGGER-START

TimeToTrigger ::= ENUMERATED {

ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256,

ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560,

ms5120}

-- TAG-TIMETOTRIGGER-STOP

-- ASN1STOP

==========================================================NEXT CHANGE========================================================

6.4 RRC multiplicity and type constraint values

– Multiplicity and type constraint definitions

-- ASN1START

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-START

maxAdditionalRACH-r17 INTEGER ::= 256 -- Maximum number of additional RACH configurations.

maxAI-DCI-PayloadSize-r16 INTEGER ::= 128 --Maximum size of the DCI payload scrambled with ai-RNTI

maxAI-DCI-PayloadSize-1-r16 INTEGER ::= 127 --Maximum size of the DCI payload scrambled with ai-RNTI minus 1

maxBandComb INTEGER ::= 65536 -- Maximum number of DL band combinations

maxBandComb-MUSIM-r18 INTEGER ::= 64 -- Maximum number of MUSIM bands and/or band combinations

maxBandsUTRA-FDD-r16 INTEGER ::= 64 -- Maximum number of bands listed in UTRA-FDD UE caps

maxCandidateBandIndex-r18 INTEGER ::= 8 -- Maximum number of band entry index for MUSIM capability

maxBH-RLC-ChannelID-r16 INTEGER ::= 65536 -- Maximum value of BH RLC Channel ID

maxBT-IdReport-r16 INTEGER ::= 32 -- Maximum number of Bluetooth IDs to report

maxBT-Name-r16 INTEGER ::= 4 -- Maximum number of Bluetooth name

maxCAG-Cell-r16 INTEGER ::= 16 -- Maximum number of NR CAG cell ranges in SIB3, SIB4

maxTwoPUCCH-Grp-ConfigList-r16 INTEGER ::= 32 -- Maximum number of supported configuration(s) of {primary PUCCH group

-- config, secondary PUCCH group config}

maxTwoPUCCH-Grp-ConfigList-r17 INTEGER ::= 16 -- Maximum number of supported configuration(s) of {primary PUCCH group

-- config, secondary PUCCH group config} for PUCCH cell switching

maxCBR-Config-r16 INTEGER ::= 8 -- Maximum number of CBR range configurations for sidelink communication

-- congestion control

maxCBR-Config-1-r16 INTEGER ::= 7 -- Maximum number of CBR range configurations for sidelink communication

-- congestion control minus 1

maxCBR-Level-r16 INTEGER ::= 16 -- Maximum number of CBR levels

maxCBR-Level-1-r16 INTEGER ::= 15 -- Maximum number of CBR levels minus 1

maxCellATG-r18 INTEGER ::= 8 -- Maximum number of ATG neighbour cells for which assistance information is

-- provided

maxCellExcluded INTEGER ::= 16 -- Maximum number of NR exclude-listed cell ranges in SIB3, SIB4

maxCellGroupings-r16 INTEGER ::= 32 -- Maximum number of cell groupings for NR-DC

maxCellHistory-r16 INTEGER ::= 16 -- Maximum number of visited PCells reported

maxPSCellHistory-r17 INTEGER ::= 16 -- Maximum number of visited PSCells across all reported PCells

maxCellInter INTEGER ::= 16 -- Maximum number of inter-Freq cells listed in SIB4

maxCellIntra INTEGER ::= 16 -- Maximum number of intra-Freq cells listed in SIB3

maxCellMeasEUTRA INTEGER ::= 32 -- Maximum number of cells in E-UTRAN

maxCellMeasIdle-r16 INTEGER ::= 8 -- Maximum number of cells per carrier for idle/inactive measurements

maxCellMeasUTRA-FDD-r16 INTEGER ::= 32 -- Maximum number of cells in FDD UTRAN

maxCellNTN-r17 INTEGER ::= 4 -- Maximum number of NTN neighbour cells for which assistance information is

-- provided

maxCarrierTypePairList-r16 INTEGER ::= 16 -- Maximum number of supported carrier type pair of (carrier type on which

-- CSI measurement is performed, carrier type on which CSI reporting is

-- performed) for CSI reporting cross PUCCH group

maxCellAllowed INTEGER ::= 16 -- Maximum number of NR allow-listed cell ranges in SIB3, SIB4

maxEARFCN INTEGER ::= 262143 -- Maximum value of E-UTRA carrier frequency

maxEUTRA-CellExcluded INTEGER ::= 16 -- Maximum number of E-UTRA exclude-listed physical cell identity ranges

-- in SIB5

maxEUTRA-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxFeatureCombPreamblesPerRACHResource-r17 INTEGER ::= 256 -- Maximum number of feature combination preambles.

maxLogMeasReport-r16 INTEGER ::= 520 -- Maximum number of entries for logged measurements

maxMultiBands INTEGER ::= 8 -- Maximum number of additional frequency bands that a cell belongs to

maxNARFCN INTEGER ::= 3279165 -- Maximum value of NR carrier frequency

maxNR-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxFreqIdle-r16 INTEGER ::= 8 -- Maximum number of carrier frequencies for idle/inactive measurements

maxNrofServingCells INTEGER ::= 32 -- Max number of serving cells (SpCells + SCells)

maxNrofServingCells-1 INTEGER ::= 31 -- Max number of serving cells (SpCells + SCells) minus 1

maxNrofAggregatedCellsPerCellGroup INTEGER ::= 16

maxNrofAggregatedCellsPerCellGroupMinus4-r16 INTEGER ::= 12

maxNrofAperiodicFwdTimeResource-r18 INTEGER ::= 112 -- Max number of aperiodic fowarding time resources for NCR

maxNrofAperiodicFwdTimeResource-1-r18 INTEGER ::= 111 -- Max number of aperiodic fowarding time resources for NCR minus 1

maxNrofDUCells-r16 INTEGER ::= 512 -- Max number of cells configured on the collocated IAB-DU

maxNrofAppLayerMeas-r17 INTEGER ::= 16 -- Max number of simultaneous application layer measurements

maxNrofAppLayerMeas-1-r17 INTEGER ::= 15 -- Max number of simultaneous application layer measurements minus 1

maxNrofAppLayerReports-r18 INTEGER ::= 16 -- Max number of application layer measurement reports with the same

-- measConfigAppLayerId included in the same

-- MeasurementReportAppLayerMessage

maxNrofAvailabilityCombinationsPerSet-r16 INTEGER ::= 512 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5

maxNrofAvailabilityCombinationsPerSet-1-r16 INTEGER ::= 511 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5 minus 1

maxNrofIABResourceConfig-r17 INTEGER ::= 65536 -- Max number of IAB-ResourceConfigID used in MAC CE

maxNrofIABResourceConfig-1-r17 INTEGER ::= 65535 -- Max number of IAB-ResourceConfigID used in MAC CE minus 1

maxNrofPeriodicFwdResourceSet-r18 INTEGER ::= 32 -- Max number of periodic fowarding resource sets for NCR

maxNrofPeriodicFwdResourceSet-1-r18 INTEGER ::= 31 -- Max number of periodic fowarding resource sets for NCR minus 1

maxNrofPeriodicFwdResource-r18 INTEGER ::= 1024 -- Max number of periodic fowarding resources for NCR

maxNrofPeriodicFwdResource-1-r18 INTEGER ::= 1023 -- Max number of periodic fowarding resources for NCR minus 1

maxNrofSemiPersistentFwdResourceSet-r18 INTEGER ::= 32 -- Max number of semi-persistent fowarding resource sets for NCR

maxNrofSemiPersistentFwdResourceSet-1-r18 INTEGER ::= 31 -- Max number of semi-persistent fowarding resource sets for NCR minus 1

maxNrofSemiPersistentFwdResource-r18 INTEGER ::= 128 -- Max number of semi-persistent fowarding resources for NCR

maxNrofSemiPersistentFwdResource-1-r18 INTEGER ::= 127 -- Max number of semi-persistent fowarding resources for NCR minus 1

maxNrofSCellActRS-r17 INTEGER ::= 255 -- Max number of RS configurations per SCell for SCell activation

maxNrofSCells INTEGER ::= 31 -- Max number of secondary serving cells per cell group

maxNrofCellMeas INTEGER ::= 32 -- Maximum number of entries in each of the cell lists in a measurement object

maxNrofCRS-IM-InterfCell-r17 INTEGER ::= 8 -- Maximum number of LTE interference cells for CRS-IM per UE

maxNrofRelayMeas-r17 INTEGER ::= 32 -- Maximum number of L2 U2N Relay UEs to measure for each measurement object

-- on sidelink frequency

maxNrofCG-SL-r16 INTEGER ::= 8 -- Max number of sidelink configured grant

maxNrofCG-SL-1-r16 INTEGER ::= 7 -- Max number of sidelink configured grant minus 1

maxSL-GC-BC-DRX-QoS-r17 INTEGER ::= 16 -- Max number of sidelink DRX configurations for NR

-- sidelink groupcast/broadcast communication

maxNrofSL-RxInfoSet-r17 INTEGER ::= 4 -- Max number of sidelink DRX configuration sets in sidelink DRX assistant

-- information

maxNrofSS-BlocksToAverage INTEGER ::= 16 -- Max number for the (max) number of SS blocks to average to determine cell measurement

maxNrofCondCells-r16 INTEGER ::= 8 -- Max number of conditional candidate SpCells

maxNrofCondCells-1-r17 INTEGER ::= 7 -- Max number of conditional candidate SpCells minus 1

maxNrofCSI-RS-ResourcesToAverage INTEGER ::= 16 -- Max number for the (max) number of CSI-RS to average to determine cell measurement

maxNrofDL-Allocations INTEGER ::= 16 -- Maximum number of PDSCH time domain resource allocations

maxNrofDL-AllocationsExt-r17 INTEGER ::= 64 -- Maximum number of PDSCH time domain resource allocations for multi-PDSCH

-- scheduling

maxNrofDL-Allocations-1-r18 INTEGER ::= 15 -- Maximum number of PDSCH time domain resource allocations minus 1

maxNrofPDU-Sessions-r17 INTEGER ::= 256 -- Maximum number of PDU Sessions

maxNrofSR-ConfigPerCellGroup INTEGER ::= 8 -- Maximum number of SR configurations per cell group

maxNrofLCGs-r18 INTEGER ::= 8 -- Maximum number of LCGs

maxLCG-ID INTEGER ::= 7 -- Maximum value of LCG ID

maxLCG-ID-IAB-r17 INTEGER ::= 255 -- Maximum value of LCG ID for IAB-MT

maxLC-ID INTEGER ::= 32 -- Maximum value of Logical Channel ID

maxLC-ID-Iab-r16 INTEGER ::= 65855 -- Maximum value of BH Logical Channel ID extension

maxLTE-CRS-Patterns-r16 INTEGER ::= 3 -- Maximum number of additional LTE CRS rate matching patterns

maxNrOfLinkedSRS-CarriersInactive-1-r18 INTEGER ::= 2 -- Maximum number of carriers for positioning SRS CA in RRC\_INACTIVE minus 1

maxNrofTAGs INTEGER ::= 4 -- Maximum number of Timing Advance Groups

maxNrofTAGs-1 INTEGER ::= 3 -- Maximum number of Timing Advance Groups minus 1

maxNrofBWPs INTEGER ::= 4 -- Maximum number of BWPs per serving cell

maxNrofCombIDC INTEGER ::= 128 -- Maximum number of reported MR-DC combinations for IDC

maxNrofSymbols-1 INTEGER ::= 13 -- Maximum index identifying a symbol within a slot (14 symbols, indexed from 0..13)

maxNrofSlots INTEGER ::= 320 -- Maximum number of slots in a 10 ms period

maxNrofSlots-1 INTEGER ::= 319 -- Maximum number of slots in a 10 ms period minus 1

maxNrofPhysicalResourceBlocks INTEGER ::= 275 -- Maximum number of PRBs

maxNrofPhysicalResourceBlocks-1 INTEGER ::= 274 -- Maximum number of PRBs minus 1

maxNrofPhysicalResourceBlocksPlus1 INTEGER ::= 276 -- Maximum number of PRBs plus 1

maxNrofControlResourceSets INTEGER ::= 12 -- Max number of CoReSets configurable on a serving cell

maxNrofControlResourceSets-1 INTEGER ::= 11 -- Max number of CoReSets configurable on a serving cell minus 1

maxNrofControlResourceSets-1-r16 INTEGER ::= 15 -- Max number of CoReSets configurable on a serving cell extended in minus 1

maxNrofCoresetPools-r16 INTEGER ::= 2 -- Maximum number of CORESET pools

maxCoReSetDuration INTEGER ::= 3 -- Max number of OFDM symbols in a control resource set

maxNrofSearchSpaces-1 INTEGER ::= 39 -- Max number of Search Spaces minus 1

maxNrofSearchSpacesLinks-1-r17 INTEGER ::= 39 -- Max number of Search Space links minus 1

maxNrofBFDResourcePerSet-r17 INTEGER ::= 64 -- Max number of reference signal in one BFD set

maxSFI-DCI-PayloadSize INTEGER ::= 128 -- Max number payload of a DCI scrambled with SFI-RNTI

maxSFI-DCI-PayloadSize-1 INTEGER ::= 127 -- Max number payload of a DCI scrambled with SFI-RNTI minus 1

maxIAB-IP-Address-r16 INTEGER ::= 32 -- Max number of assigned IP addresses

maxINT-DCI-PayloadSize INTEGER ::= 126 -- Max number payload of a DCI scrambled with INT-RNTI

maxINT-DCI-PayloadSize-1 INTEGER ::= 125 -- Max number payload of a DCI scrambled with INT-RNTI minus 1

maxNrofRateMatchPatterns INTEGER ::= 4 -- Max number of rate matching patterns that may be configured

maxNrofRateMatchPatterns-1 INTEGER ::= 3 -- Max number of rate matching patterns that may be configured minus 1

maxNrofRateMatchPatternsPerGroup INTEGER ::= 8 -- Max number of rate matching patterns that may be configured in one group

maxNrofCSI-ReportConfigurations INTEGER ::= 48 -- Maximum number of report configurations

maxNrofCSI-ReportConfigurations-1 INTEGER ::= 47 -- Maximum number of report configurations minus 1

maxNrofCSI-ResourceConfigurations INTEGER ::= 112 -- Maximum number of resource configurations

maxNrofCSI-ResourceConfigurations-1 INTEGER ::= 111 -- Maximum number of resource configurations minus 1

maxNrofAP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrOfCSI-AperiodicTriggers INTEGER ::= 128 -- Maximum number of triggers for aperiodic CSI reporting

maxNrofReportConfigPerAperiodicTrigger INTEGER ::= 16 -- Maximum number of report configurations per trigger state for aperiodic reporting

maxNrofNZP-CSI-RS-Resources INTEGER ::= 192 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources

maxNrofNZP-CSI-RS-Resources-1 INTEGER ::= 191 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources minus 1

maxNrofNZP-CSI-RS-ResourcesPerSet INTEGER ::= 64 -- Maximum number of NZP CSI-RS resources per resource set

maxNrofNZP-CSI-RS-ResourcesPerSet-1-r18 INTEGER ::= 63 -- Maximum number of NZP CSI-RS resources per resource set minus 1

maxNrofNZP-CSI-RS-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-RS resource sets per cell

maxNrofNZP-CSI-RS-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-RS resource sets per cell minus 1

maxNrofNZP-CSI-RS-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of resource sets per resource configuration

maxNrofNZP-CSI-RS-ResourcesPerConfig INTEGER ::= 128 -- Maximum number of resources per resource configuration

maxNrofZP-CSI-RS-Resources INTEGER ::= 32 -- Maximum number of Zero-Power (ZP) CSI-RS resources

maxNrofZP-CSI-RS-Resources-1 INTEGER ::= 31 -- Maximum number of Zero-Power (ZP) CSI-RS resources minus 1

maxNrofZP-CSI-RS-ResourceSets-1 INTEGER ::= 15

maxNrofZP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrofZP-CSI-RS-ResourceSets INTEGER ::= 16

maxNrofCSI-IM-Resources INTEGER ::= 32 -- Maximum number of CSI-IM resources

maxNrofCSI-IM-Resources-1 INTEGER ::= 31 -- Maximum number of CSI-IM resources minus 1

maxNrofCSI-IM-ResourcesPerSet INTEGER ::= 8 -- Maximum number of CSI-IM resources per set

maxNrofCSI-IM-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-IM resource sets per cell

maxNrofCSI-IM-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-IM resource sets per cell minus 1

maxNrofCSI-IM-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of CSI IM resource sets per resource configuration

maxNrofCSI-SSB-ResourcePerSet INTEGER ::= 64 -- Maximum number of SSB resources in a resource set

maxNrofCSI-SSB-ResourceSets INTEGER ::= 64 -- Maximum number of CSI SSB resource sets per cell

maxNrofCSI-SSB-ResourceSets-1 INTEGER ::= 63 -- Maximum number of CSI SSB resource sets per cell minus 1

maxNrofCSI-SSB-ResourceSetsPerConfig INTEGER ::= 1 -- Maximum number of CSI SSB resource sets per resource configuration

maxNrofCSI-SSB-ResourceSetsPerConfigExt INTEGER ::= 2 -- Maximum number of CSI SSB resource sets per resource configuration

-- extended

maxNrofFailureDetectionResources INTEGER ::= 10 -- Maximum number of failure detection resources

maxNrofFailureDetectionResources-1 INTEGER ::= 9 -- Maximum number of failure detection resources minus 1

maxNrofFailureDetectionResources-1-r17 INTEGER ::= 63 -- Maximum number of the enhanced failure detection resources minus 1

maxNrofFreqSL-r16 INTEGER ::= 8 -- Maximum number of carrier frequency for NR sidelink communication

maxNrofFreqSL-1-r18 INTEGER ::= 7 -- Maximum number of carrier frequency for NR sidelink communication minus 1

maxNrofSL-BWPs-r16 INTEGER ::= 4 -- Maximum number of BWP for NR sidelink communication

maxNrofSL-CarrierSetConfig-r18 INTEGER ::= 96 -- Maximum number of SCCH carrier set configuration for NR sidelink

-- communication

maxFreqSL-EUTRA-r16 INTEGER ::= 8 -- Maximum number of EUTRA anchor carrier frequency for NR sidelink

-- communication

maxNrofSL-MeasId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement identity (RSRP) per destination

maxNrofSL-ObjectId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement objects (RSRP) per destination

maxNrofSL-ReportConfigId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement reporting configuration(RSRP) per destination

maxNrofSL-PoolToMeasureNR-r16 INTEGER ::= 8 -- Maximum number of resource pool for NR sidelink measurement to measure

-- for each measurement object (for CBR)

maxNrofDedicatedSL-PRS-PoolToMeas-r18 INTEGER ::= 8 -- Maximum number of SL-PRS dedicated resource pool for positioning

-- measurement to measure for each measurement object (for SL-PRS CBR)

maxFreqSL-NR-r16 INTEGER ::= 8 -- Maximum number of NR anchor carrier frequency for NR sidelink communication

maxNrofSL-QFIs-r16 INTEGER ::= 2048 -- Maximum number of QoS flow for NR sidelink communication per UE

maxNrofSL-QFIsPerDest-r16 INTEGER ::= 64 -- Maximum number of QoS flow per destination for NR sidelink communication

maxNrofObjectId INTEGER ::= 64 -- Maximum number of measurement objects

maxNrofPageRec INTEGER ::= 32 -- Maximum number of page records

maxNrofPCI-Ranges INTEGER ::= 8 -- Maximum number of PCI ranges

maxPLMN INTEGER ::= 12 -- Maximum number of PLMNs broadcast and reported by UE at establishment

maxTAC-r17 INTEGER ::= 12 -- Maximum number of Tracking Area Codes to which a cell belongs to

maxNrofCSI-RS-ResourcesRRM INTEGER ::= 96 -- Maximum number of CSI-RS resources per cell for an RRM measurement object

maxNrofCSI-RS-ResourcesRRM-1 INTEGER ::= 95 -- Maximum number of CSI-RS resources per cell for an RRM measurement object

-- minus 1.

maxNrofMeasId INTEGER ::= 64 -- Maximum number of configured measurements

maxNrofQuantityConfig INTEGER ::= 2 -- Maximum number of quantity configurations

maxNrofCSI-RS-CellsRRM INTEGER ::= 96 -- Maximum number of cells with CSI-RS resources for an RRM measurement object

maxNrofSL-Dest-r16 INTEGER ::= 32 -- Maximum number of destination for NR sidelink communication and discovery

maxNrofSL-Dest-1-r16 INTEGER ::= 31 -- Highest index of destination for NR sidelink communication and discovery

maxNrofSL-PRS-PerDest-r18 INTEGER ::= 8 -- Max number of SL-PRS transmission supported per destination UE

maxNrofSLRB-r16 INTEGER ::= 512 -- Maximum number of radio bearer for NR sidelink communication per UE without duplication

maxSL-LCID-Plus1-r18 INTEGER ::= 513 -- Maximum number of RLC bearer for NR sidelink communication per UE without duplication plus 1

maxSL-LCID-r18 INTEGER ::= 1024 -- Maximum number of RLC bearer for NR sidelink communication per UE with duplication

maxSL-NonAnchorRBsets INTEGER ::= 4 -- Maximum number of non-anchor RB sets

maxSL-LCID-r16 INTEGER ::= 512 -- Maximum number of RLC bearer for NR sidelink communication per UE

maxSL-SyncConfig-r16 INTEGER ::= 16 -- Maximum number of sidelink Sync configurations

maxNrofRXPool-r16 INTEGER ::= 16 -- Maximum number of Rx resource pool for NR sidelink communication and

-- discovery

maxNrofTXPool-r16 INTEGER ::= 8 -- Maximum number of Tx resource pool for NR sidelink communication and

-- discovery

maxNrofPoolID-r16 INTEGER ::= 16 -- Maximum index of resource pool for NR sidelink communication and

-- discovery

maxNrofSRS-PathlossReferenceRS-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for SRS power control.

maxNrofSRS-PathlossReferenceRS-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for SRS power control

-- minus 1.

maxNrofSRS-ResourceSets INTEGER ::= 16 -- Maximum number of SRS resource sets in a BWP.

maxNrofSRS-ResourceSets-1 INTEGER ::= 15 -- Maximum number of SRS resource sets in a BWP minus 1.

maxNrofSRS-PosResourceSets-r16 INTEGER ::= 16 -- Maximum number of SRS Positioning resource sets in a BWP.

maxNrofSRS-PosResourceSets-1-r16 INTEGER ::= 15 -- Maximum number of SRS Positioning resource sets in a BWP minus 1.

maxNrofSRS-Resources INTEGER ::= 64 -- Maximum number of SRS resources.

maxNrofSRS-Resources-1 INTEGER ::= 63 -- Maximum number of SRS resources minus 1.

maxNrofSRS-PosResources-r16 INTEGER ::= 64 -- Maximum number of SRS Positioning resources.

maxNrofSRS-PosResources-1-r16 INTEGER ::= 63 -- Maximum number of SRS Positioning resources minus 1.

maxNrofSRS-ResourcesPerSet INTEGER ::= 16 -- Maximum number of SRS resources in an SRS resource set

maxNrofSRS-TriggerStates-1 INTEGER ::= 3 -- Maximum number of SRS trigger states minus 1, i.e., the largest code point.

maxNrofSRS-TriggerStates-2 INTEGER ::= 2 -- Maximum number of SRS trigger states minus 2.

maxRAT-CapabilityContainers INTEGER ::= 8 -- Maximum number of interworking RAT containers (incl NR and MRDC)

maxSimultaneousBands INTEGER ::= 32 -- Maximum number of simultaneously aggregated bands

maxSimultaneousBands-2-r18 INTEGER ::= 30 -- Maximum number of simultaneously aggregated bands minus 2.

maxULTxSwitchingBandPairs INTEGER ::= 32 -- Maximum number of band pairs supporting dynamic UL Tx switching in a band

-- combination.

maxULTxSwitchingBetweenBandPairs-r18 INTEGER ::= 32 -- Maximum number of combinations of a band pair and another band pair/band

-- between which dynamic UL Tx switching requires additional switching

-- period.

maxSchedulingBandCombination-r18 INTEGER ::= 32 -- Maximum number of combinations of scheduling cell and co-scheduled cells

-- have same or different carrier type.

maxNrofSlotFormatCombinationsPerSet INTEGER ::= 512 -- Maximum number of Slot Format Combinations in a SF-Set.

maxNrofSlotFormatCombinationsPerSet-1 INTEGER ::= 511 -- Maximum number of Slot Format Combinations in a SF-Set minus 1.

maxNrofTrafficPattern-r16 INTEGER ::= 8 -- Maximum number of Traffic Pattern for NR sidelink communication.

maxNrofPUCCH-Resources INTEGER ::= 128

maxNrofPUCCH-Resources-1 INTEGER ::= 127

maxNrofPUCCH-ResourceSets INTEGER ::= 4 -- Maximum number of PUCCH Resource Sets

maxNrofPUCCH-ResourceSets-1 INTEGER ::= 3 -- Maximum number of PUCCH Resource Sets minus 1.

maxNrofPUCCH-ResourcesPerSet INTEGER ::= 32 -- Maximum number of PUCCH Resources per PUCCH-ResourceSet

maxNrofPUCCH-P0-PerSet INTEGER ::= 8 -- Maximum number of P0-pucch present in a p0-pucch set

maxNrofPUCCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUCCH power control.

maxNrofPUCCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUCCH power control

-- minus 1.

maxNrofPUCCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUCCH power control

-- extended.

maxNrofPUCCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUCCH power control

-- minus 1 extended.

maxNrofPUCCH-PathlossReferenceRSs-1-r17 INTEGER ::= 7 -- Maximum number of RSs used as pathloss reference for PUCCH power control

-- minus 1.

maxNrofPUCCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between the extended maximum and the non-extended maximum

maxNrofPUCCH-ResourceGroups-r16 INTEGER ::= 4 -- Maximum number of PUCCH resources groups.

maxNrofPUCCH-ResourcesPerGroup-r16 INTEGER ::= 128 -- Maximum number of PUCCH resources in a PUCCH group.

maxNrofPowerControlSetInfos-r17 INTEGER ::= 8 -- Maximum number of PUCCH power control set infos

maxNrofMultiplePUSCHs-r16 INTEGER ::= 8 -- Maximum number of multiple PUSCHs in PUSCH TDRA list

maxNrofP0-PUSCH-AlphaSets INTEGER ::= 30 -- Maximum number of P0-pusch-alpha-sets (see TS 38.213 [13], clause 7.1)

maxNrofP0-PUSCH-AlphaSets-1 INTEGER ::= 29 -- Maximum number of P0-pusch-alpha-sets minus 1 (see TS 38.213 [13], clause 7.1)

maxNrofPUSCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUSCH power control.

maxNrofPUSCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUSCH power control

-- minus 1.

maxNrofPUSCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUSCH power control

-- extended

maxNrofPUSCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUSCH power control

-- extended minus 1

maxNrofPUSCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between maxNrofPUSCH-PathlossReferenceRSs-r16 and

-- maxNrofPUSCH-PathlossReferenceRSs

maxNrofPathlossReferenceRSs-r17 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUSCH, PUCCH, SRS

-- power control for unified TCI state operation

maxNrofPathlossReferenceRSs-1-r17 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUSCH, PUCCH, SRS

-- power control for unified TCI state operation minus 1

maxNrofNAICS-Entries INTEGER ::= 8 -- Maximum number of supported NAICS capability set

maxBands INTEGER ::= 1024 -- Maximum number of supported bands in UE capability.

maxBandsMRDC INTEGER ::= 1280

maxBandsEUTRA INTEGER ::= 256

maxCellReport INTEGER ::= 8

maxDRB INTEGER ::= 29 -- Maximum number of DRBs (that can be added in DRB-ToAddModList).

maxFreq INTEGER ::= 8 -- Max number of frequencies.

maxFreqLayers INTEGER ::= 4 -- Max number of frequency layers.

maxFreqPlus1 INTEGER ::= 9 -- Max number of frequencies for Slicing.

maxFreqIDC-r16 INTEGER ::= 128 -- Max number of frequencies for IDC indication.

maxCombIDC-r16 INTEGER ::= 128 -- Max number of reported UL CA for IDC indication.

maxFreqIDC-MRDC INTEGER ::= 32 -- Maximum number of candidate NR frequencies for MR-DC IDC indication

maxNrofCandidateBeams INTEGER ::= 16 -- Max number of PRACH-ResourceDedicatedBFR in BFR config.

maxNrofCandidateBeams-r16 INTEGER ::= 64 -- Max number of candidate beam resources in BFR config.

maxNrofCandidateBeamsExt-r16 INTEGER ::= 48 -- Max number of PRACH-ResourceDedicatedBFR in the CandidateBeamRSListExt

maxNrofPCIsPerSMTC INTEGER ::= 64 -- Maximum number of PCIs per SMTC.

maxNrofQFIs INTEGER ::= 64

maxNrofResourceAvailabilityPerCombination-r16 INTEGER ::= 256

maxNrOfSemiPersistentPUSCH-Triggers INTEGER ::= 64 -- Maximum number of triggers for semi persistent reporting on PUSCH

maxNrofSR-Resources INTEGER ::= 8 -- Maximum number of SR resources per BWP in a cell.

maxNrofSlotFormatsPerCombination INTEGER ::= 256

maxNrofSpatialRelationInfos INTEGER ::= 8

maxNrofSpatialRelationInfos-plus-1 INTEGER ::= 9

maxNrofSpatialRelationInfos-r16 INTEGER ::= 64

maxNrofSpatialRelationInfosDiff-r16 INTEGER ::= 56 -- Difference between maxNrofSpatialRelationInfos-r16 and maxNrofSpatialRelationInfos

maxNrofIndexesToReport INTEGER ::= 32

maxNrofIndexesToReport2 INTEGER ::= 64

maxNrofSSBs-r16 INTEGER ::= 64 -- Maximum number of SSB resources in a resource set.

maxNrofSSBs-1 INTEGER ::= 63 -- Maximum number of SSB resources in a resource set minus 1.

maxNrofS-NSSAI INTEGER ::= 8 -- Maximum number of S-NSSAI.

maxNrofTCI-StatesPDCCH INTEGER ::= 64

maxNrofTCI-States INTEGER ::= 128 -- Maximum number of TCI states.

maxNrofTCI-States-1 INTEGER ::= 127 -- Maximum number of TCI states minus 1.

maxUL-TCI-r17 INTEGER ::= 64 -- Maximum number of TCI states.

maxUL-TCI-1-r17 INTEGER ::= 63 -- Maximum number of TCI states minus 1.

maxNrofAdditionalPCI-r17 INTEGER ::= 7 -- Maximum number of additional PCI

maxNrofAdditionalPRACHConfigs-r18 INTEGER ::= 7 -- Maximum number of additional PRACH configurations for 2TA

maxNrofdelayD-r18 INTEGER ::= 4 -- Maximum number of delayD values.

maxMPE-Resources-r17 INTEGER ::= 64 -- Maximum number of pooled MPE resources

maxNrofUL-Allocations INTEGER ::= 16 -- Maximum number of PUSCH time domain resource allocations.

maxQFI INTEGER ::= 63

maxRA-CSIRS-Resources INTEGER ::= 96

maxRA-OccasionsPerCSIRS INTEGER ::= 64 -- Maximum number of RA occasions for one CSI-RS

maxRA-Occasions-1 INTEGER ::= 511 -- Maximum number of RA occasions in the system

maxRA-SSB-Resources INTEGER ::= 64

maxSCSs INTEGER ::= 5

maxSecondaryCellGroups INTEGER ::= 3

maxNrofServingCellsEUTRA INTEGER ::= 32

maxMBSFN-Allocations INTEGER ::= 8

maxNrofMultiBands INTEGER ::= 8

maxCellSFTD INTEGER ::= 3 -- Maximum number of cells for SFTD reporting

maxReportConfigId INTEGER ::= 64

maxNrofCodebooks INTEGER ::= 16 -- Maximum number of codebooks supported by the UE

maxNrofCSI-RS-ResourcesExt-r16 INTEGER ::= 16 -- Maximum number of codebook resources supported by the UE for eType2/Codebook combo

maxNrofCSI-RS-ResourcesExt-r17 INTEGER ::= 8 -- Maximum number of codebook resources for fetype2R1 and fetype2R2

maxNrofCSI-RS-Resources INTEGER ::= 7 -- Maximum number of codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-r16 INTEGER ::= 512 -- Maximum number of alternative codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-1-r16 INTEGER ::= 511 -- Maximum number of alternative codebook resources supported by the UE minus 1

maxNrofSRI-PUSCH-Mappings INTEGER ::= 16

maxNrofSRI-PUSCH-Mappings-1 INTEGER ::= 15

maxSIB INTEGER::= 32 -- Maximum number of SIBs

maxSI-Message INTEGER::= 32 -- Maximum number of SI messages

maxSIB-MessagePlus1-r17 INTEGER::= 33 -- Maximum number of SIB messages plus 1

maxPO-perPF INTEGER ::= 4 -- Maximum number of paging occasion per paging frame

maxPEI-perPF-r17 INTEGER ::= 4 -- Maximum number of PEI occasion per paging frame

maxAccessCat-1 INTEGER ::= 63 -- Maximum number of Access Categories minus 1

maxBarringInfoSet INTEGER ::= 8 -- Maximum number of access control parameter sets

maxCellEUTRA INTEGER ::= 8 -- Maximum number of E-UTRA cells in SIB list

maxEUTRA-Carrier INTEGER ::= 8 -- Maximum number of E-UTRA carriers in SIB list

maxPLMNIdentities INTEGER ::= 8 -- Maximum number of PLMN identities in RAN area configurations

maxDownlinkFeatureSets INTEGER ::= 1024 -- (for NR DL) Total number of FeatureSets (size of the pool)

maxUplinkFeatureSets INTEGER ::= 1024 -- (for NR UL) Total number of FeatureSets (size of the pool)

maxEUTRA-DL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxEUTRA-UL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxFeatureSetsPerBand INTEGER ::= 128 -- (for NR) The number of feature sets associated with one band.

maxPerCC-FeatureSets INTEGER ::= 1024 -- (for NR) Total number of CC-specific FeatureSets (size of the pool)

maxFeatureSetCombinations INTEGER ::= 1024 -- (for MR-DC/NR)Total number of Feature set combinations (size of the pool)

maxInterRAT-RSTD-Freq INTEGER ::= 3

maxGIN-r17 INTEGER ::= 24 -- Maximum number of broadcast GINs

maxHRNN-Len-r16 INTEGER ::= 48 -- Maximum length of HRNNs

maxNPN-r16 INTEGER ::= 12 -- Maximum number of NPNs broadcast and reported by UE at establishment

maxSNPN-ConfigCellId-r18 INTEGER ::= 32 -- Maximum number of Cell ID subject for SNPNS for MDT scope

maxSNPN-ConfigID-r18 INTEGER ::= 16 -- Maximum number of SNPNs subject for MDT scope

maxSNPN-ConfigTAI-r18 INTEGER ::= 8 -- Maximum number of TA subject for MDT scope

maxNrOfMinSchedulingOffsetValues-r16 INTEGER ::= 2 -- Maximum number of min. scheduling offset (K0/K2) configurations

maxK0-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K0)

maxK2-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K2)

maxK0-SchedulingOffset-r17 INTEGER ::= 64 -- Maximum number of slots configured as min. scheduling offset (K0)

maxK2-SchedulingOffset-r17 INTEGER ::= 64 -- Maximum number of slots configured as min. scheduling offset (K2)

maxDCI-2-6-Size-r16 INTEGER ::= 140 -- Maximum size of DCI format 2-6

maxDCI-2-7-Size-r17 INTEGER ::= 43 -- Maximum size of DCI format 2-7

maxDCI-2-6-Size-1-r16 INTEGER ::= 139 -- Maximum DCI format 2-6 size minus 1

maxDCI-2-9-Size-r18 INTEGER ::= 140 -- Maximum DCI format 2-9 size

maxDCI-2-9-Size-1-r18 INTEGER ::= 139 -- Maximum DCI format 2-9 size minus 1

maxNrofUL-Allocations-r16 INTEGER ::= 64 -- Maximum number of PUSCH time domain resource allocations

maxNrofUL-Allocations-1-r18 INTEGER ::= 63 -- Maximum number of PUSCH time domain resource allocations minus 1

maxNrofP0-PUSCH-Set-r16 INTEGER ::= 2 -- Maximum number of P0 PUSCH set(s)

maxOnDemandSIB-r16 INTEGER ::= 8 -- Maximum number of SIB(s) that can be requested on-demand

maxOnDemandPosSIB-r16 INTEGER ::= 32 -- Maximum number of posSIB(s) that can be requested on-demand

maxCI-DCI-PayloadSize-r16 INTEGER ::= 126 -- Maximum number of the DCI size for CI

maxCI-DCI-PayloadSize-1-r16 INTEGER ::= 125 -- Maximum number of the DCI size for CI minus 1

maxUu-RelayRLC-ChannelID-r17 INTEGER ::= 32 -- Maximum value of Uu Relay RLC channel ID

maxWLAN-Id-Report-r16 INTEGER ::= 32 -- Maximum number of WLAN IDs to report

maxWLAN-Name-r16 INTEGER ::= 4 -- Maximum number of WLAN name

maxRAReport-r16 INTEGER ::= 8 -- Maximum number of RA procedures information to be included in the RA report

maxTxConfig-r16 INTEGER ::= 64 -- Maximum number of sidelink transmission parameters configurations

maxTxConfig-1-r16 INTEGER ::= 63 -- Maximum number of sidelink transmission parameters configurations minus 1

maxPSSCH-TxConfig-r16 INTEGER ::= 16 -- Maximum number of PSSCH TX configurations

maxNrofCLI-RSSI-Resources-r16 INTEGER ::= 64 -- Maximum number of CLI-RSSI resources for UE

maxNrofCLI-RSSI-Resources-1-r16 INTEGER ::= 63 -- Maximum number of CLI-RSSI resources for UE minus 1

maxNrofCLI-SRS-Resources-r16 INTEGER ::= 32 -- Maximum number of SRS resources for CLI measurement for UE

maxCLI-Report-r16 INTEGER ::= 8

maxNrofCC-Group-r17 INTEGER ::= 16 -- Maximum number of CC groups for DC location report

maxNrofConfiguredGrantConfig-r16 INTEGER ::= 12 -- Maximum number of configured grant configurations per BWP

maxNrofConfiguredGrantConfig-1-r16 INTEGER ::= 11 -- Maximum number of configured grant configurations per BWP minus 1

maxNrofCG-Type2DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for type 2 configured grants per BWP

maxNrofConfiguredGrantConfigMAC-1-r16 INTEGER ::= 31 -- Maximum number of configured grant configurations per MAC entity minus 1

maxNrofCSI-ReportSubconfigPerCSI-ReportConfig-r18 INTEGER ::= 8 -- Maximum number of CSI report subconfigurations per CSI report

-- configuration

maxNrofCSI-ReportSubconfigPerCSI-ReportConfig-1-r18 INTEGER ::= 7 -- Maximum number of CSI report subconfigurations per CSI report

-- configuration minus 1

maxNrofSPS-Config-r16 INTEGER ::= 8 -- Maximum number of SPS configurations per BWP

maxNrofSPS-Config-1-r16 INTEGER ::= 7 -- Maximum number of SPS configurations per BWP minus 1

maxNrofSPS-DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for SPS per BWP

maxNrofPPW-Config-r17 INTEGER ::= 4 -- Maximum number of Preconfigured PRS processing windows per DL BWP

maxNrofPPW-ID-1-r17 INTEGER ::= 15 -- Maximum number of Preconfigured PRS processing windows minus 1

maxNrOfTxTEGReport-r17 INTEGER ::= 256 -- Maximum number of UE Tx Timing Error Group Report

maxNrOfTxTEG-ID-1-r17 INTEGER ::= 7 -- Maximum number of UE Tx Timing Error Group ID minus 1

maxNrofPagingSubgroups-r17 INTEGER ::= 8 -- Maximum number of paging subgroups per paging occasion

maxNrofPUCCH-ResourceGroups-1-r16 INTEGER ::= 3

maxNrofReqComDC-Location-r17 INTEGER ::= 128 -- Maximum number of requested carriers/BWPs combinations for DC location

-- report

maxNrofServingCellsTCI-r16 INTEGER ::= 32 -- Maximum number of serving cells in simultaneousTCI-UpdateList

maxNrofTxDC-TwoCarrier-r16 INTEGER ::= 64 -- Maximum number of UL Tx DC locations reported by the UE for 2CC uplink CA

maxNrofRB-SetGroups-r17 INTEGER ::= 8 -- Maximum number of RB set groups

maxNrofRB-Sets-r17 INTEGER ::= 8 -- Maximum number of RB sets

maxNrofEnhType3HARQ-ACK-r17 INTEGER ::= 8 -- Maximum number of enhanced type 3 HARQ-ACK codebook

maxNrofEnhType3HARQ-ACK-1-r17 INTEGER ::= 7 -- Maximum number of enhanced type 3 HARQ-ACK codebook minus 1

maxNrofPRS-ResourcesPerSet-r17 INTEGER ::= 64 -- Maximum number of PRS resources for one set

maxNrofPRS-ResourcesPerSet-1-r17 INTEGER ::= 63 -- Maximum number of PRS resources for one set minus 1

maxNrofPRS-ResourceOffsetValue-1-r17 INTEGER ::= 511

maxNrofGapId-r17 INTEGER ::= 8 -- Maximum number of measurement gap ID

maxNrofPreConfigPosGapId-r17 INTEGER ::= 16 -- Maximum number of preconfigured positioning measurement gap

maxNrOfGapPri-r17 INTEGER ::= 16 -- Maximum number of gap priority level

maxCEFReport-r17 INTEGER ::= 4 -- Maximum number of CEF reports by the UE

maxNrofMultiplePDSCHs-r17 INTEGER ::= 8 -- Maximum number of PDSCHs in PDSCH TDRA list

maxSliceInfo-r17 INTEGER ::= 8 -- Maximum number of NSAGs

maxCellSlice-r17 INTEGER ::= 16 -- Maximum number of cells supporting the NSAG

maxNrofTRS-ResourceSets-r17 INTEGER ::= 64 -- Maximum number of TRS resource sets

maxNrofSearchSpaceGroups-1-r17 INTEGER ::= 2 -- Maximum number of search space groups minus 1

maxNrofRemoteUE-r17 INTEGER ::= 32 -- Maximum number of connected L2 U2N Remote UEs

maxDCI-4-2-Size-r17 INTEGER ::= 140 -- Maximum size of DCI format 4-2

maxFreqMBS-r17 INTEGER ::= 16 -- Maximum number of MBS frequencies reported in MBSInterestIndication

maxNrofDRX-ConfigPTM-r17 INTEGER ::= 64 -- Max number of DRX configuration for PTM provided in MBS broadcast in a

-- cell

maxNrofDRX-ConfigPTM-1-r17 INTEGER ::= 63 -- Max number of DRX configuration for PTM provided in MBS broadcast in a

-- cell minus 1

maxNrofMBS-ServiceListPerUE-r17 INTEGER ::= 16 -- Maximum number of services which the UE can include in the MBS interest

-- indication

maxNrofMBS-Session-r17 INTEGER ::= 1024 -- Maximum number of MBS sessions provided in MBS broadcast or multicast in

-- a cell

maxNrofMTCH-SSB-MappingWindow-r17 INTEGER ::= 16 -- Maximum number of MTCH to SSB beam mapping pattern

maxNrofMTCH-SSB-MappingWindow-1-r17 INTEGER ::= 15 -- Maximum number of MTCH to SSB beam mapping pattern minus 1

maxNrofMRB-Broadcast-r17 INTEGER ::= 4 -- Maximum number of broadcast MRBs configured for one MBS broadcast service

maxNrofPageGroup-r17 INTEGER ::= 32 -- Maximum number of paging groups in a paging message

maxNrofPDSCH-ConfigPTM-r17 INTEGER ::= 16 -- Maximum number of PDSCH configuration groups for PTM

maxNrofPDSCH-ConfigPTM-1-r17 INTEGER ::= 15 -- Maximum number of PDSCH configuration groups for PTM minus 1

maxG-RNTI-r17 INTEGER ::= 16 -- Maximum number of G-RNTI that can be configured for a UE.

maxG-RNTI-1-r17 INTEGER ::= 15 -- Maximum number of G-RNTI that can be configured for a UE minus 1.

maxG-CS-RNTI-r17 INTEGER ::= 8 -- Maximum number of G-CS-RNTI that can be configured for a UE.

maxG-CS-RNTI-1-r17 INTEGER ::= 7 -- Maximum number of G-CS-RNTI that can be configured for a UE minus 1.

maxMRB-r17 INTEGER ::= 32 -- Maximum number of multicast MRBs (that can be added in MRB-ToAddModLIst)

maxFSAI-MBS-r17 INTEGER ::= 64 -- Maximum number of MBS frequency selection area identities

maxNeighCellMBS-r17 INTEGER ::= 8 -- Maximum number of MBS broadcast neighbour cells

maxNrofPdcch-BlindDetectionMixed-1-r16 INTEGER ::= 7 -- Maximum number of combinations of mixed Rel-16 and Rel-15 PDCCH

-- monitoring capabilities minus 1

maxNrofPdcch-BlindDetection-r17 INTEGER ::= 16 -- Maximum number of combinations of PDCCH blind detection monitoring

-- capabilities

maxNrofAltitudeRanges-r18 INTEGER ::= 8 -- Maximum number of altitude ranges for altitude-based measurement configurations

maxWayPoint-r18 INTEGER ::= 20 -- Maximum number of flight path information waypoints

maxAltitude-r18 INTEGER ::= 10000 -- Maximum altitude in meters

minAltitude-r18 INTEGER ::= -420 -- Minimum altitude in meters

maxMeasSequence-r18 INTEGER ::= 64 -- Maximum number of configured sequence for measurement

maxNrofHops-1-r18 INTEGER ::= 5 -- Maximum number of Hops that can be configured for Positioning SRS Transmission

maxNrOfCellsInVA-r18 INTEGER ::= 16 -- Maximum number of cells in validity area for Positioning SRS

maxNrOfCellsInVA-Ext-r18 INTEGER ::= 16 -- Maximum number of additional cells in validity area for Positioning SRS

maxNrOfLinkedSRS-PosResourceSet-r18 INTEGER ::= 3 -- Maximum number of linked SRSPosResourceSets that can be aggregated across

-- CCs

maxNrOfLinkedSRS-PosResSetComb-r18 INTEGER ::= 32 -- Maximum number of combinations of linked SRSPosResourceSets that can be

-- aggregated in RRC\_CONNECTED state

maxNrOfLinkedSRS-PosResSetCombInactive-r18 INTEGER ::= 16 -- Maximum number of combinations of linked SRSPosResourceSets that can be

-- aggregated in RRC\_INACTIVE state

maxCBR-ConfigDedSL-PRS-1-r18 INTEGER ::= 7 -- Maximum number of CBR ranges for dedicated SL PRS resource pool

maxCBR-LevelDedSL-PRS-1-r18 INTEGER ::= 15 -- Maximum number of CBR levels for dedicated SL PRS resource pool

maxNrofSL-PRS-TxPool-r18 INTEGER ::= 8 -- Maximum number of Tx dedicated SL-PRS resource pool for NR sidelink positioning

maxNrofSL-PRS-TxConfig-r18 INTEGER ::= 64 -- Maximum number of SL PRS transmission parameter configurations

maxNrOfVA-r18 INTEGER ::= 16 -- Maximum number of validity area

maxNrofLTM-Configs-r18 INTEGER ::= 8 -- Maximum number of LTM candidate cells

maxNrofLTM-Configs-plus1-r18 INTEGER ::= 9 -- Maximum number of LTM candidate cells plus 1

maxNrofLTM-CSI-ReportConfigurations-r18 INTEGER ::= 48 -- Maximum number of LTM CSI reporting configurations

maxNrofLTM-CSI-ReportConfigurations-1-r18 INTEGER ::= 47 -- Maximum number of LTM CSI reporting configurations minus 1

maxNrofLTM-CSI-ResourcesPerSet-r18 INTEGER ::= 512 -- Maximum number of LTM SSB or CSI-RS resource per set

maxNrofLTM-CSI-ResourceConfigurations-r18 INTEGER ::= 112 -- Maximum number of LTM CSI resource configurations

maxNrofLTM-CSI-ResourceConfigurations-1-r18 INTEGER ::= 111 -- Maximum number of LTM CSI resource configurations minus 1

maxNrofCandidateTCI-State-r18 INTEGER ::= 128 -- Maximum number of LTM TCI states

maxNrofCandidateUL-TCI-r18 INTEGER ::= 64 -- Maximum number of LTM UL TCI states

maxSecurityCellSet-r18 INTEGER ::= 9 -- Maximum number of cell sets for subsequent CPAC.

maxSK-Counter-r18 INTEGER ::= 8 -- Maximum number of SK-counters configured for a cell set for subsequent CPAC.

maxNrofThresholdMBS-r18 INTEGER ::= 8 -- Max number of thresholds of MBS sessions for RRC connection resume for a

-- UE receiving multicast in RRC\_INACTIVE

maxNrofThresholdMBS-1-r18 INTEGER ::= 7 -- Max number of thresholds of MBS sessions for RRC connection resume for a

-- UE receiving multicast in RRC\_INACTIVE minus 1

maxTN-AreaInfo-r18 INTEGER ::= 32 -- Maximum number of TN coverage areas for which assistance info is

-- provided in an NTN cell

maxNrofSetsOfCells-r18 INTEGER ::= 4 -- Maximum number of sets of cells for multi-cell PDSCH/PUSCH scheduling

maxNrofSetsOfCells-1-r18 INTEGER ::= 3 -- Maximum number of sets of cells for multi-cell PDSCH/PUSCH scheduling

-- minus 1

maxNrofCellsInSet-r18 INTEGER ::= 4 -- Maximum number of cells configured in a set of cells for multi-cell

-- PDSCH/PUSCH scheduling

maxNrofCellsInSet-1-r18 INTEGER ::= 3 -- Maximum number of cells configured in a set of cells for multi-cell

-- PDSCH/PUSCH scheduling minus 1

maxNrofCellCombos-r18 INTEGER ::= 16 -- Maximum number of combinations of co-scheduled cells for multi-cell

-- PDSCH/PUSCH scheduling

maxNrofBWPsInSetOfCells-r18 INTEGER ::= 16 -- Maximum number of BWPs configured in a set of cells for multi-cell

-- PDSCH/PUSCH scheduling

maxLowerMSD-r18 INTEGER ::= 256 -- Maximum number of lower MSD capability sets for a victim band

maxLowerMSDInfo-r18 INTEGER ::= 64 -- Maximum number of lower MSD capability sets for a band combination

maxNrofIntraEndc-Components-r17 INTEGER ::= 4 -- Maximum number of intra-band (NG)EN-DC band components in an inter-band

-- (NG)EN-DC band combination

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-STOP

-- ASN1STOP

==========================================================CHANGE ENDS========================================================

# Annex: List of RAN2 agreements during R19 Mobility discussion

#### RAN2#125bis

**Agreements on inter-CU LTM:**

1. RAN2 first focus on inter-CU LTM in NR standalone scenario and use it as baseline for supporting inter-CU LTM in NR-DC scenarios.
2. Rel-19 inter-CU LTM also supports mixture of subsequent inter-CU LTM and subsequent intra-CU LTM after an inter-CU or intra-CU LTM switch.
3. UE can be configured with a mixture of intra-CU and inter-CU candidate LTM cells and irrespective of how the UE is configured with this mixture, UE measurement and reporting procedures will be the same for both intra-CU and inter-CU candidate LTM cells.
4. Mobility latency analysis of rel-18 intra-CU LTM is reused for Rel-19 inter-CU LTM.
5. Early DL and UL sync is also supported for inter-CU LTM. Inform RAN3 of this. Early DL sync using CSI-RS should be considered, pending RAN1 approval.
6. PDCCH ordered early RACH is supported for inter-CU LTM.
7. For early TA acquisition, Rel-18 option is baseline. FFS for RAR based option.
8. Upon inter-CU LTM execution, UE performs

- MAC reset

- RLC re-establishment

- PDCP re-establishment

- Security key update

1. FFS if there is an inter-CU LTM w/o security key change.

**Agreements on measurements:**

1. L1 LTM measurement event configuration is associated with L1 measurement resource configuration provided in LTM configuration via RRC signaling.

#### RAN2#126

**Agreements on inter-CU LTM:**

1. An LTM configuration with inter-CU LTM candidate cells can be configured either by the MCG or SCG (but not for both simultaneously) and it is up to the network to handle this (further details up to RAN3, if any). No restriction for intra-CU LTM candidate cells.
2. Xn-based inter-CU LTM is prioritized in Rel-19.
3. The preparation of inter-CU LTM configuration is initiated by the source gNB-CU.
4. For each candidate cell, the preparation of lower layer configuration is initiated by the candidate gNB-CU, based on the LTM request from the source gNB-CU. RAN2 assumes the interaction between the candidate gNB-CU and candidate gNB-DU follows the same signaling procedure for intra-CU LTM.
5. The source gNB-CU is responsible to collect the configurations and information of candidate cells from multiple candidate gNB-CUs and generates the common CSI resource configuration for L1 measurement on candidate cells.
6. In order to support subsequent LTM, the source gNB-CU needs to inform the candidate gNB-CU(s) about the common CSI resource configuration and the collected information of candidate cells from multiple candidate gNB-CUs. The candidate gNB-CU(s) responds with the candidate configuration to the source gNB-CU accordingly (if needed).
7. The RRC signalling structure and modelling for Rel-18 LTM is taken as the baseline for inter-CU LTM.
8. For inter-CU LTM, LTM candidate ID is unique across all the participating gNB-CUs.
9. The maximum number of LTM candidate cell configuration is 8, regardless of whether these are intra-CU or inter-CU LTM candidate configurations.
10. RAR-based TA acquisition is not supported for inter-CU LTM for non-conditional LTM. FFS on conditional LTM.
11. R18 LTM CSC MAC CE is baseline to trigger LTM cell switch for inter-CU LTM.
12. Support CG-based RACH-less and DG-based RACH-less procedures for inter-CU LTM.
13. The LTM completion defined for intra-CU LTM is followed for R19 LTM.

**Agreements on measurement enhancements for LTM:**

1. Event triggered L1 measurement should be designed for the following LTM purposes:

- Select the candidate beam/cell to trigger early synchronization.

- Select the target beam/cell and trigger LTM cell switch procedure.

1. For event triggered L1 measurement, use of beam level measurement result for event evaluation is baseline. FFS for the cell level measurement.
2. Support the following LTM events based on beam specific quality of serving cell and candidate cells as the L1 LTM measurement events.

- Event LTM2: Beam of serving cell becomes worse than absolute threshold;

- Event LTM3: Beam of candidate cell becomes amount of offset better than beam of serving cell;

- Event LTM4: Beam of candidate cell becomes better than absolute threshold;

- Event LTM5: Beam of serving cell becomes worse than absolute threshold1 AND Beam of candidate cell becomes better than another absolute threshold2.

- FFS on what beam(s) of the serving cell and neighboring cell is used for event evaluation. FFS on the need of Event LTM1.

1. Support the beam config of both SSB and CSI-RS in L1 measurement resource configuration in LTM config. Working assumption: Same RS type should be used for both serving and neighbouring cell for event LTM3 and event LTM5.
2. RAN2 assumes filtering of the L1 measure results is needed. It’s up to RAN1 whether the specified L1 filtering is needed or ok to leave it to UE implementation.
3. For LTM event evaluation, TTT, hysteresis for entering/leaving, and/or beam specific (FFS for cell specific) offset can be applied. FFS on the need of measurement reporting once leaving condition is met.

#### RAN2#127

**Agreements on inter-CU LTM**

1. Inter-CU LTM re-uses the reference configuration from Rel-18 LTM. No additional reference configurations (no multiple reference configurations) are supported.
2. The Rel-18 signaling structure for LTM CSI resource and report configuration is reused for inter-CU LTM, i.e. a common CSI resource configuration and cell-specific CSI report configuration.
3. The source CU is responsible to generate the common CSI resource configuration.
4. For inter-CU LTM, the R18 candidate TCI State activation/deactivation design (including MAC CE and related UE handling) is reused.
5. For inter-CU LTM cell switch, it’s the source DU that triggers the MAC CE and informs the source CU about the target LTM cell.
6. If the security key update is required, the UE shall perform MAC reset, RLC re-establishment and PDCP re-establishment. As baseline introduce a new Rel-19 ID in RRC: if the Rel-19 ID is different for the source cell and the target cell, the UE performs PDCP re-establishment, including security key update, however dependent on SA3 response, we can revisit it.
7. As in Rel-18 LTM, the UE keeps its LTM candidate cell configurations after at least a inter-CU LTM cell switch procedure where the UE is not configured with DC, unless these are explicitly released by the network.
8. RAN2 understand NW implementation can handle the concern raised in P6, R2-2407421.
9. L3 mobility (including both the network triggered L3 HO and CHO) can be configured to UE, while the inter-CU LTM is configured (w/o DC), and the following items can be considered (follow Rel-18 intra-CU LTM):

- When performing the L3 mobility (HO or CHO), the UE does not autonomously release inter-CU LTM configurations, unless these are explicitly released by the network.

- The RRCReconfiguration message to execute an L3 mobility (HO or CHO) procedure may reconfigure inter-CU LTM configurations.

- For the execution order between CHO and LTM, Rel-18 principle is applied.

1. Inter-CU SCG LTM preparation can be initiated by source SN.
2. The inter-CU SCG LTM configuration, SN generates SCG part configuration, MN includes it into its MN RRC configuration message.
3. For inter-CU SCG LTM, the LTM cell switch command MAC CE is sent by source SN.
4. RAN2 understands for the security key update of inter-CU SCG LTM, SCPAC security key update mechanism is taken as baseline. We will send LS to SA3 to ask them to take it into account for their works.
5. Only SN-initiated inter-SN LTM (including LTM configuration, early DL/UL synch and LTM execution) is supported in Rel-19.
6. SCG configuration can be changed in inter-CU MN and leave how to handle SCG part up to NW implementation (e.g. release or reconfiguration).
7. Upon execution of inter-CU MN LTM with DC, the UE is required to perform refresh of security key, re-establishment of RLC and PDCP, and MAC reset at both MN and SN side (i.e. Rel-15 principle is applied).
8. For the SN key update in inter-CU MN LTM with DC, the UE applies legacy R15 RRC reconfiguration with sync procedure.

**Agreements on event-triggered measurement report**

1. Event LTM1 is not defined.
2. Current beam (i.e. a beam corresponding to the indicated TCI state) is used for event evaluation in L1 measurement reporting for serving cell.
3. Any beam in candidate RS configuration can be used for LTM event evaluation.
4. Beam level measurement result, not cell level measurement result, is used LTM event evaluation. FFS on the conditional LTM case.
5. R19 LTM event triggered measurement configuration can be taken as baseline:

- LTM measurement resource configuration is provided in LTM-config.

- Event triggered report config is provided in serving cell config.

6. MAC layer handles the event evaluation and measurement report triggering.

7. Event-triggered L1-measurements are reported by the UE to the network via MAC CE.

#### RAN2#127bis

**Agreements on inter-CU LTM**

1. The Rel18 handling on failure is reused in R19 if the UE selects an intra-CU LTM candidate cell after intra-CU LTM failure; for other cases, e.g. inter-CU LTM failure, the failure handling is FFS (related to SA3’s inputs).
2. For non-DC case, if the new Rel-19 IDs of the serving cell and the target cell have same values, the UE compares the ltm-ServingCellNoResetID and ltm-NoResetID and performs the corresponding L2 reset operation as defined in Rel-18.
3. The SCPAC-similar security update configuration is introduced for inter-CU SCG LTM, i.e. similar to IEs sk-CounterConfiguration, servingSecurityCellSetId and securityCellSetId. The names of the new IEs are to be discussed in stage3.
4. Regarding the candidate and reference configuration generation and signaling design, the following SCPAC-similar principles can be applied for inter-CU SCG LTM as baseline:

- The reference configuration for inter-CU SCG LTM at least include SCG part, FFS on MCG part.

- FFS: Network ensures that when UE combines the reference and candidate configuration for inter-CU SCG LTM, the configuration generated by UE must contain both MCG and SCG part configurations.

- The candidate configuration and reference configuration are modeled as an MN RRCReconfiguration message.

- Upon inter-CU SCG LTM, the UE performs reconfiguration with sync towards SCG, but the reconfiguration with sync in MCG is not allowed.

- The MN generates the MCG part of the reference configuration (if any), while the SN (source or candidate) generates the SCG part of the reference configuration.

- The MN is responsible for the reference configuration generation for SN initiated inter-CU SCG LTM. It can be up to the NW implementation whether to include the MCG part.

- The MN can request an SCG reference configuration from any of the involved SNs.

1. For SN initiated inter-CU SCG LTM, the candidate SN provides the SCG part configuration of each candidate PSCell, and may also provide the L1 RS (e.g. a list of SSB or a list of CSI-RS) configuration for L1 measurement, early UL sync configuration or TCI-state configuration, to the MN.
2. The source SN is responsible to generate the common CSI resource configuration for L1 measurement on candidate SCG cells.
3. The MN sends the received L1 RS configuration, early UL sync configuration, or TCI-state configuration of candidate cells to the source SN. And the source SN responds with the common CSI resource configuration to the MN.
4. In order to support subsequent inter-CU SCG LTM, the MN needs to transfer ,during the LTM preparation phase, the common CSI resource configuration and the collected information of candidate cells to the candidate SN(s). Accordingly, the candidate SN(s) responds with the updated candidate SCG configuration to the MN.
5. Upon execution of inter-SN SCG LTM, the UE sends an MN RRCReconfigurationComplete message to the MN, which includes an SN RRCReconfigurationComplete message.
6. Re-use legacy LTM Cell Switch Command MAC CE for inter-SN LTM.
7. RAN2 confirms to support coexistence of following cases, it is up to network implementation to ensure simultaneous execution for both MCG and SCG will not happen:

- Inter-MN LTM and intra-SN LTM

- Inter-SN LTM and intra-MN LTM

**Agreements on L1 event triggered MR**

1. MR can be sent when the leaving condition is met, based on NW configuration.

2. Event triggered periodic MR can be supported, based on NW configuration.

3. For measurement resource configuration, R18 LTM CSI resource configuration is reused if possible. If CSI-RS resource only IE needs to be defined, we can revisit it in the stage 3.

4. For measurement reporting configuration, R18 LTM-CSI-ReportConfig is reused if possible. We can revisit it in the stage 3 if needed.

5. For association between measurement resource configuration and measurement reporting configuration, R18 LTM way is reused if possible. We can revisit it in the stage 3 if needed.

6. The entire event evaluation procedure is handled by MAC based on the latest L1 measured results reported by L1.

7. TTT operates only based on a timer (like TTT used in L3 event triggered MR).

8. Confirms WA (Same RS type should be used for both serving and neighbouring cell for event LTM3 and event LTM5).

9. Basic information included in MR MAC CE:

- Beam information: FFS if SSBRI/CRI of N beams or (LTM configuration id + SSB/CSI-RS id)

- Beam quantity: L1-RSRP or SINR (up to RAN1) of N beams

- Triggered event information (e.g., ReportConfigID)

MR MAC CE can include up to N beams (FFS whether the beam should satisfy the event or not).

- N is configurable by NW.

10. Additional information included in MR MAC CE:

- The information and quantity of current beam, based on NW configuration.

11. The legacy SR procedure for resource allocation is the baseline to send the event-triggered L1 measurements MAC CE.

12. NW can configure a dedicated SR configuration for MR MAC CE transmission.

**Agreements on C-LTM**

1. Source cell sends the conditional LTM configuration via RRCReconfiguration to UE, which includes the LTM candidate configurations, and the corresponding execution conditions.

2. Event LTM3-like and LTM5-like are used as the conditional LTM execution condition. FFS on reuse of CHO conditions.

3. Source cell and each candidate cell provides its own execution condition for conditional LTM.

4. It is DU to generate the L1 execution condition. FFS on a case that L3 measurement is used.

5. RACH-less Conditional intra-CU LTM is supported.

6. RACH based conditional intra-CU LTM is supported.

7. UE based TA measurement mechanism is supported for conditional intra-CU LTM.

8. PDCCH ordered early TA acquisition is supported for conditional LTM.

9. Rel-18 Early candidate TCI State activation/deactivation is supported for conditional intra-CU LTM.

10. For RACH-less conditional LTM, CG-based first UL transmission on target cell is supported. FFS on DG-based approach.

11. The LTM completion defined for Rel-18 intra-CU LTM is reused for conditional LTM.

#### RAN2#128

**Agreements on inter-CU LTM:**

1. Rel-19 Set ID is configured for a candidate configuration. For DRB:

- Inter-CU MCG LTM: When Rel-19 Set ID of candidate cell is different from serving cell,

- UE performs PDCP re-establishment to all radio bearers.

- Inter-CU SCG LTM: When Rel-19 Set ID of candidate cell is different from serving cell,

- For MN terminated bearer without change of termination point, UE does not perform PDCP re-establishment. PDCP recovery is needed if it is split bearer.

- For SN terminated bearer without change of termination point, UE performs PDCP re-establishment.

- If there is change of termination point for a radio bearer (the keyToUse in the RadioBearerConfig is different from the keyToUse in the current UE configuration), UE performs PDCP re-establishment.

2. For SRBs in inter-CU SCG LTM, Rel-19 ID is used to determine whether PDCP re-establishment or PDCP SDU discard is performed for LTM execution for SRB3.

3. For SRB1/2 in inter-CU SCG LTM, PDCP re-established is not performed based on NW configuration (PDCP re-establishment flag and SDU discard).

4. RAN2 confirms that inter-CU MCG LTM with SCG addition is supported assuming no much specification effort is required. If there are much specification efforts, we will not have it.

5. RAN2 confirms that the inter-CU MCG LTM with intra-SN PSCell change is supported in Rel19.

6. From RAN2 perspective, the following coexistence cases in NR-DC can be supported:

- Case 1: Intra-CU MCG LTM + Inter-CU MCG LTM

- Case 2: Intra-CU SCG LTM + Inter-CU SCG LTM

7. In coexistence cases of inter-CU MCG/SCG LTM and intra-CU MCG/SCG LTM, when inter-CU MCG or SCG LTM is executed, it’s up to the NW to ensure that maintained LTM candidate configurations are valid, e.g. reconfigure or release invalid intra-CU MCG/SCG LTM candidate configurations. UE does not autonomously release invalid intra-CU candidate configurations.

8. RAN2 to support intra-CU SCG LTM in MN RRC message (i.e. MN RRCReconfiguration message), in addition to SN RRC message.

9. RAN2 to support intra-CU MCG LTM with SCG configuration.

10. It’s up to NW to ensure that the complete configuration includes the MCG part and SCG part configuration when UE combines the reference and candidate configuration for inter-CU SCG LTM.

11. RAN2 assumes that how to indicate the list of candidate PSCells from source SN to MN is up to RAN3. From RAN2 perspective, in INM, source SN may send measurement results of candidate PSCells to the MN. The MN then forwards the measurement results to the candidate SN(s), and then the candidate SN(s) determines the LTM candidate cells based on the measurement results and the upper limit for the number of PSCells that can be prepared by each candidate SN. The existing IEs defined in INM can be reused as a baseline.

**Agreements on L1 event-driven MR:**

1. TTT is evaluated per beam, and measurement report is only triggered by beam that has satisfied the condition (entering/leaving) for the whole duration of TTT.

2. TTT timer is not restarted if the current beam changes and the entering condition is still met with the new current beam.

3. TTT is applied to the leaving condition.

4. Network can configure which RS type (SSB or CSI-RS) is used for LTM event evaluation.

5. Either CSI-RS or SSB could be configured as candidate beam and the measurement RS of the serving cell beam is determined based on the candidate beam to ensure same RS type, i.e. the RS for current beam of serving cell is same as or QCLed with the QCL RS of the indicated TCI state, according to what is agreed in RAN1.

6. SSBRI and CRI is used to represent the candidate beam ID in LTM MR MAC CE.

7. For event-triggered L1 LTM measurement reporting, max N is total number of all beams included into MR MAC CE.

8. For event-triggered L1 LTM measurement reporting, NW controls if the beam(s) not satisfying the event could be reported according to N beams in MR MAC CE.

9. A single MAC CE format for the event-triggered L1 measurement report is used for both the SSB and CSI-RS reference signals.

10. Support the truncated measurement report MAC CE.

**Agreements on C-LTM:**

1. The triggering condition of conditional LTM can be based on L3 measurement.

2. CondEventA3 and CondEventA5 conditions can be baseline for the conditional LTM execution.

3. The L1 execution condition of a candidate cell is associated to only one triggering event.

4. For L3 execution condition, it may consist of one or two triggering condition(s). If there are two triggering conditions associated with the same candidate cell, the UE shall consider the execution condition is fulfilled only when both triggering conditions are met. Only single RS type is supported and at most two different trigger quantities can be configured simultaneously for the evaluation of execution condition of a single candidate cell.

5. To support initial and subsequent conditional LTM, the following items can be considered for the configuration of execution condition:

- The CLTM configuration of each candidate cell shall include the execution condition for initial conditional LTM, which is generated by the initial source cell to trigger the CLTM for the candidate cell.

- The CLTM configuration of each candidate cell may include execution conditions for subsequent conditional LTM, which is generated by the candidate cell to trigger the CLTM for other candidate cells when the candidate cell becomes a serving cell.

6. The network can configure measurement reports e.g., L1 periodic, semi-persistent, aperiodic and event triggered report, or L3 measurement reports for conditional LTM, e.g., to trigger PDCCH ordered early RACH.

7. For CLTM, the Candidate Cell TCI States Activation/Deactivation MAC CE is re-used for the early activation/deactivation of TCI state(s) of a CLTM candidate configuration.

8. The Early TA is signalled to the UE from the source cell (i.e., not from the candidate cell directly to the UE). This agreement will be included in the LS to RAN1/3/4.

9. The network can inform the candidate cell’s TA information to UE via new MAC CE, which is the TA value when UE switches to that candidate cell during CLTM.

10. Candidate cell TA is maintained by a new timer.

11. For L1-based conditional LTM the condition evaluation is at MAC level and for L3-based conditional LTM the condition evaluation is at RRC level.

#### RAN2#129

**Agreements on RRC issues:**

1. For inter-CU SCG LTM, introducing the SK counter list in LTM-ConfigSCG-r19, each list associated with one ltm-NoSecurityChangeID.

2. Reuse the selectedSK-Counter-r18 to indicate the selected SK counter upon the execution of inter-CU SCG LTM.

3. The reference configuration related to inter-SN LTM is included within the new ltm-ConfigSCG field.

4. UE does not combine reference configurations from ltm-Config and ltm-ConfigSCG.

5. FFS whether only one indication is needed to indicate LTM configuration as complete configuration.

6. The existing field mrdc-ReleaseAndAdd is always included when SCG configuration is included during an MCG LTM execution. Can be revisited if there is any issue.

7. The release of the LTM configuration (MCG or SCG) follows the Rel-18 principles.

8. A maximum number of 8 candidate configurations (LTM plus CLTM candidate configurations) can be configured.

9. The LTM-Candidate IE is re-used to model an CLTM candidate cell configuration.

10. Re-use existing L1 events for CLTM.

11. For field ltm3-Offset-r19, the granularity is 0.5 dB.

12. Add extension mark “…” to LTM-ConfigSCG-r19, adopt the principle that fields only applicable to inter-CU SCG change should be defined in the root of LTM-ConfigSCG-r19, not LTM-Config-r18.

**Agreements on MAC issues:**

1. CLTM TAT is started/re-started when UE receives TA value for the candidate cell sent by the MAC CE from current serving cell.

2. If the CLTM TAT associated with one candidate cell is running, UE considers the TA for the candidate cell is valid; if CLTM TAT associated with one candidate cell expires, UE considers the TA for the candidate cell is invalid.

3. If UE has valid TA value at the time CLTM execution, UE performs RACH-less CLTM, otherwise UE performs RACH base CLTM.

4. The CLTM TAT is per candidate configuration.

5. FFS on whether the received CLTM TAs of other candidate cells is released or still valid at UE side upon CLTM execution.

6. Absolute TA value is included in the MAC CE for CLTM early TA acquisition.

7. The candidate configuration ID is included in the MAC CE for CLTM early TA acquisition. And one configuration ID for one TA in one MAC CE.

8. RAN2 assumes the CSI-RS could be associated with the indicated TCI state in LTM cell switch MAC CE and in the candidate cell TCI state Activation/Deactivation MAC CE, pending RAN1 confirmation.

9. The Measurement Report MAC CE is transmitted with a higher LCP than 'data from any Logical Channel, except data from UL-CCCH'.

10. The Measurement Report MAC CE is transmitted with the same LCH priority as MAC CE for (Enhanced) BFR.

11. The max number of N (included in the MR MAC CE) is the total number of all candidate beams without counting current serving beam.

12. There is no restriction on which serving cell(s) L1 Measurement Report MAC CE can be transmitted on, i.e. not limited to SpCell.

13. Truncated event-triggered L1 measurement report MAC CE can be used when the available grant is not sufficient to accommodate the normal measurement report MAC CE plus subheader.

**Agreements on inter-CU LTM:**

1. Using the term “LTM” to represent “intra-CU LTM” and “inter-CU LTM” in MAC specification, and introduce separate term for “conditional intra-CU LTM” in the specification(s).

2. Same as Rel-18 intra-CU LTM, Rel-19 inter-CU LTM could coexist with CovE, (e)RedCap, while couldn’t coexist with NRU. FFS on MIMO 2TA and NES.

3. Same as Rel-18 intra-CU LTM, CFRA resource configuration could be included in LTM cell switch command MAC CE for Rel-19 inter-CU LTM.

4. For inter-CU MCG LTM, when Rel-19 ID of candidate cell is different from serving cell, the UE performs PDCP re-establishment for SRB1/SRB2.

5. For inter-CU MCG LTM, when the Rel-19 ID of candidate cell is the same with serving cell, the UE performs PDCP SDU discard for SRB1/SRB2.

6. How to support shared RACH resources for inter-CU LTM is left to RAN3.

**Agreements on L1 event-triggered MR:**

1. Confirm on the previous agreement that "For measurement resource configuration, R18 LTM CSI resource configuration is reused".

2. Continue to carry the bits for SSB resource set when CSI-RS resource set is configured. FFS whether CSI-RS can be configured without SSB (up to R1 to decide).

3. Do not create a new resource configuration just for the event triggered measurements.

4. Confirm on the previous agreement "For measurement reporting configuration, R18 LTM-CSI-ReportConfig is reused".

5. Ask RAN1 what should be the maximum number of beam measurement results that can be reported in event-triggered measurement report.

6. Reuse the existing RSRP values and RSRP offset values and their interpretations in TS 38.133 for event-triggered measurement report. Can revisit if RAN4 identifies any issue.

7. TimeToTrigger and reportInterval of L3 measurement report can be reused. FFS on additional value(s) of reportInterval.

8. Cell specific offset is not supported for LTM L1 event evaluation.

9. The trigger quantity for LTM L1 event triggered measurement is the same as the report quantity.

10. Explicit indication in MR MAC CE to inform which beam(s) meets the event condition with TTT. FFS on the detailed signalling.

11. Explicit indication in MR MAC CE to inform the leaving event condition is met. FFS whether it is per beam.

12. R18 differential RSRP encoding is used as baseline.

13. LTM MR MAC CE only include one triggered measurement event and the LTM MR MAC CE can be multiplexed in any available UL grant.

14. Select the beam not satisfying the event condition, based on the measured quality (i.e. according to the best beam(s))

15. Truncated MR MAC CE includes the triggered beam information:

- One report config ID (event config ID)

- At least one triggered beam id (SSBRI or CRI) + L1 RSRP

16. Common format for normal MR MAC CE and truncated MR MAC CE is used. Details are handled by MAC running CR rapporteur.

17. For truncated LTM MR MAC CE, an LCID separate from that for non-truncated LTM MR MAC CE is used.

18. S-measureConfig is applicable to in the L1 event-triggered MR. No additional change is expected on RRC and MAC.

**Agreements on C-LTM:**

1. From a given source cell, network configures either L1 execution condition or L3 execution condition for a CLTM candidate cell.

2. The UE starts execution condition evaluation once it receives CLTM configuration including C-LTM execution condition.

3. For conditional LTM based on L1 measurements (LTM3/5-like event), the evaluation is per candidate beam. For conditional LTM based on L3 measurements (condA3/condA5 events), the evaluation is per candidate cell (i.e., with consolidation of multiple beams of the candidate cell).

4. When the C-LTM execution condition is satisfied with a candidate beam (any beam from the candidate RS set) / cell, UE performs RACH-less C-LTM (with that triggered beam for L1 based C-LTM case) if UE has a valid TA for the associated candidate cell. Otherwise, UE performs RACH-based C-LTM.

5. For L1 based C-LTM (assuming single beam fulfils C-LTM execution condition), beam selection for RACH-less LTM with CG is based on the beam meets C-LTM execution condition.

6. For L1 based C-LTM events, the C-LTM execution is triggered when at least one beam fulfills the C-LTM event condition. When multiple candidate beams satisfy the C-LTM condition, it is up to UE implementation to select a beam and perform C-LTM.

7. Do not support DG-based first UL transmission for RACH-less conditional LTM.

8. For RACH-based conditional LTM procedure, CFRA can be supported when CFRA resource is included in candidate cell configurations, otherwise CBRA is performed.

9. For intra-CU CLTM, it is up to NW implementation to ensure that only the candidate cells belonging to the same CU as the current serving cell are provided with the execution conditions.

10. Support the CLTM fast failure recovery, which reuses R18 LTM failure recovery mechanism (i.e. based on CBRA).

#### RAN2#129bis

**Agreement on RRC open issues**

1. A list of sk-counters is linked to a Rel-19 ID configured by the SN.

2. At RLF and reconfiguration with sync failure:

- If RLF: If the selected candidate cell has the same Rel-19 ID as source (no security key change), the UE performs fast RLF recovery (same as in Rel-18).

- if reconfiguration failure (inter-CU LTM): If the selected candidate cell has the same Rel-19 ID as target, the UE performs fast failure recovery. FFS if fast failure recovery with different Rel-19 IDs is allowed.

3. How to indicate whether an LTM candidate configuration is a complete configuration is the same as Rel-18 (no different indication for MCG and SCG part of the candidate configuration).

4. The indication on whether to allow or not the SN to configure an inter-SN candidate is included in the inter-node RRC message. We include this agreement in the LS to RAN3.

5. Network can send an LTM Cell Switch Command MAC CE indicating a CLTM candidate configuration (no specification change).

6. Select two values of 20ms and 60ms for the additional values.

**Agreement on MAC open issues**

1. Introducing a new R19 LTM cell switch command MAC CE with indicating the NCC value for R19 inter-CU LTM cell switch. Details will be further discussed during CR phase.

2. For differential L1-RSRP reporting, the best quality beam among the beams included in L1 MR MAC CE is taken as the reference beam as the first one. The differential L1-RSRP value is derived based on the absolute L1-RSRP of the reference beam. FFS for truncated MAC CE.

3. When UL grant is enough to accommodate only limited number of beams in MR MAC CE, the triggered beam should be included in the truncated MR MAC CE.

4. When current beam is configured to be included in the L1 MR MAC CE, 7 bits of RSRP is included and no RSRI is needed.

5. The current beam information of SpCell (if configured to be included) is always placed at the end of the normal (not truncated) MAC CE.

6. Same as Rel-18: When the C-LTM execution is triggered, if the TA of the target cell acquired by early RACH is valid, UE applies the TA acquired by early RACH, otherwise if UE has successfully measured the TA of the target cell, UE applies the measured TA.

7. FFS For MR triggered by LTM2, whether only include the current beam information in the MR MAC CE or the MR can include measurements for LTM candidates.

**Agreement on UE capability**

1. No need to define a separate capability for the reference configuration for inter-CU LTM.

2. Define per-UE capabilities for security key change of MCG LTM (e.g. ltm-KeyUpdate-MCG-r19) and security key change of SCG LTM (e.g. ltm-KeyUpdate-SCG-r19). UE supports these capabilities should also support ltm-MCG-IntraFreq-r18 or ltm-SCG-IntraFreq-r18 respectively. No new UE capability on inter-CU MCG LTM with SN unchanged and inter-CU MCG LTM SN with SCG addition.

3. Define a per-band capability for L1 execution condition, e.g. cltm-ExecutionConditionL1-r19 is defined to indicate whether the UE supports L1 execution condition for CLTM and subsequent CLTM.

4. Define a per-band capability for L3 execution condition, e.g. cltm-ExecutionConditionL3-r19 is defined to indicate whether the UE supports L3 execution condition for CLTM and subsequent CLTM and whether the UE supports 2 trigger events for same execution condition.

5. A UE that supports conditional LTM should indicate the support for at least one of cltm-ExecutionConditionL3-r19 or cltm-ExecutionConditionL1-r19.

6. When a UE indicates support for both conditional LTM and ltm-RACH-LessCG-r18, it implies that the UE supports RACH-less conditional LTM with a configured grant. Whether/how to update the field description of ltm-RACH-LessCG-r18 can be addressed in the running CR review.

7. Rely on the R18 capability (i.e., ue-TA-Measurement-r18) to indicate whether UE supports UE-based TA measurement for C-LTM. There is no need to define a separate capability for this purpose.

8. Define a new per UE capability for UE support of early TA MAC CE reception for CLTM and also the max number of maintaining TA values. The value range is (1~8).

9. Rely on the R18 capability (i.e., ltm-MAC-CE-JointTCI-r18 and ltm-MAC-CE-SeparateTCI-r18) to indicate whether the UE supports MAC-CE activated joint/separate LTM TCI states for CLTM.

**Agreements on inter-CU LTM**

1. For security key update in inter-CU LTM, RAN2 agree to include actual NCC value in the LTM cell switch command MAC CE.

2. NCC is included in the LTM cell switch command MAC CE if the R19 set ID is different between the target cell and source cell. Conversely, if the R19 set ID is same for both cells, the NCC will not be included.

3. NW configures the corresponding sk-Counter in all LTM candidate configurations, and UE uses the configured value for generating the SN key when security key update is performed in MCG.

4. From RAN2 point of view, UE-based TA measurement can be also applicable for the synchronized inter-CU LTM scenario, and no additional RAN2 specification impact is expected. Final decision is up to RAN4.

5. MIMO 2TA can be configured with inter-CU LTM using PDCCH-order based TA measurement.

6. If UE-based TA measurement is supported for inter-CU LTM, it cannot be configured if candidate cell is configured with MIMO 2TA.

7. An LTM target cell will not apply cell DTX/DRX until LTM cell switch is completed. RAN2 will not consider any specification impacts needed for LTM RACH-less cell switch to an NES candidate cell.

**Agreements on L1 event-triggered MR**

1. Introduce new MAC CE to activate/deactivate the semi-persistent CSI-RS resource.

2. The new MAC CE includes: A/D indication, Target configuration id or {SP CSI-RS resource set id and/or candidate id}, TCI state id.

3. In L1 reporting configuration, the UE can be configured with a list of candidate IDs. For each listed candidate ID, the network can configure an offset, this offset applies to all the RSs belong the candidate ID that associated with the reporting configuration (the offset value also includes 0dB); If a candidate ID is not provided in the reporting configuration, it means the UE is not required to measure/evaluate the RSs that belonging to the candidate ID for this event, even if these are configured within the L1 resource configuration (to which the L1 reporting configuration points to).

4. In the MR MAC CE, adopt a uniform format for all the reported beams (i.e., using the same format for beams leaving the entering condition, beams met the entering condition, beams not satisfying the event). Introduce two bits per beam.

5. RAN2 will consider only the following options:

- Option1: To introduce four codepoints to represent one of {type1, type2, type3, type4}

- Option3: To introduce three codepoints to represent one of {type1\_or\_type3, type2, type4}, i.e., type1 beam and type3 beam are not distinguished in reporting.

Type1 beam: a beam that has satisfied the entry condition of the event for TTT and thus triggers the MR MAC CE.

Type2 beam: a beam that has satisfied the leaving condition of the event for TTT and thus triggers the MR MAC CE.

Type3 beam: a beam that is neither type1 nor type2 but has remained in beamsTriggeredList (the beam was reported as type1 beam before).

Type4 beam: a beam that is neither type1 nor type2 and not included in beamsTriggeredList (i.e., just extra beam info)

6. Working assumption: Option1: To introduce four codepoints to represent one of {type1, type2, type3, type4}

7. Intention is that the UE should be able to report the event-triggered beam(s) that were not included in the truncated MR MAC CE by the following grant. Detailed wording can be further discussed as part of the running CR.

8. For co-existence with mTRP, will be revisited in August. If one simple solution is not prepared / agreed until / in August meeting, we will not apply mTRP in Rel-19 event-triggered MR.

**Agreements on C-LTM**

1. Upon C-LTM execution, UE performs the following for received TA values and TA timers for other candidate cells than the target candidate cell: Maintain the TA value and Keep the early TA timer running.

2. C-LTM TAT for target cell is not stopped upon C-LTM cell switch execution to the target cell if it is running, and starts the PTAG using the remaining time from the C-LTM timer.

3. RAN2 confirm CLTM with Rel-18 MIMO 2TA is supported, introducing TAG ID field in LTM candidate TAC MAC CE.

1. For CLTM with Rel-18 MIMO 2TA, two TA timer length (i.e. ltm-TimeAlignmentTimer) can be configured via RRC.

# Annex: List of RAN1 agreements during R19 Mobility discussion

#### RAN1#117

**Agreement**

* Measurements related enhancements for purpose of supporting LTM:
  + Measurement related enhancements are applicable to Intra-CU MCG/SCG LTM and Inter-CU MCG/SCG LTM
  + Specify necessary components to support event triggered L1 measurement reporting
  + Specify support for CSI-RS measurements for LTM procedures and enable CSI-RS based beam management, and/or other necessary physical layer operations on candidate cells before LTM
* Specify support of conditional LTM
  + Specify UE evaluated conditions for triggering LTM
  + Aim to support conditional LTM including subsequent LTM
    - Prioritise intra-CU LTM

#### RAN1#118

**Agreement**

- Support L1-RSRP measurement based on CSI-RS

- FFS: Support L1-SINR measurement based on CSI-RS

**Agreement**

* Explicit configuration of CSI-RS resource(s) for candidate cell(s) for L1-measurement is supported

**Agreement**

- CSI-RS based L1-RSRP report is supported for gNB scheduled measurement reporting

- FFS: CSI-RS based L1-SINR report is supported for gNB scheduled measurement reporting

- Rel-18 LTM CSI reporting framework is the baseline for CSI-RS based L1-measurement report by gNB scheduled measurement reporting

**Agreement**

- SSB based L1-RSRP measurements is supported for event triggered reporting

- CSI-RS based L1-RSRP measurements is supported for event triggered reporting

- FFS: CSI-RS based L1-SINR measurements is supported for event triggered reporting

**Agreement**

For gNB scheduled reporting and event triggered reporting

- At least periodic CSI-RS is supported for L1-RSRP measurement for candidate cell

FFS: aperiodic and semi-persistent CSI-RS

- At least CSI-RS for beam management is supported for L1-RSRP measurement for candidate cell

FFS: CSI-RS for mobility

**Agreement**

For the identification of the serving cell RS for event evaluation,

- At least the following options are further studied in RAN1, where different options could apply to different LTM event

* Option. 1: Derived from QCL (type-D) RS(s) of the indicated joint/DL TCI state for the serving cell
* Option. 2: Derived from QCL RS(s) or SSB QCLed with the QCL RS of the indicated joint/DL TCI state for the serving cell. QCL RS or SSB is configured by the network
* Option. 3: Measurement RS(s) is/are explicitly configured
* Option. 4: Derived from QCL RSs of activated TCI states with the best quality, or SSB which is QCLed with the QCL RSs of activated TCI states with the best quality.
* Option 6: Derived from QCL RSs of activated TCI states, or SSB which is QCLed with the QCL RSs of activated TCI states

- The RSs of the candidate cell(s) for event evaluation are explicitly configured

- Note: Companies are encouraged to take into account the RAN2 agreement (i.e current beam rather than best beam) for their further study.

#### RAN1#118bis

**Agreement**

The agreement “Rel-18 LTM CSI reporting framework is the baseline for CSI-RS based L1-measurement report by gNB scheduled measurement reporting” made in RAN#118 is further clarified for L1-RSRP as follows:

* UCI format defined in Table 6.3.1.1.2-8C of TS38.212 can be used by replacing SSBRI with CRI.
* Whether the L1-RSRP(s) of serving cell is always included is configurable (in line with Rel-18)
* The quantization method defined in clause 5.2.1.4.3 of TS38.214 and bit width defined in Table 6.3.1.1.2-6 of TS38.212 can be used
* No L1 specified filtering for time and spatial domain is introduced
* No enhancement on how to report L cells x M beams
* Periodic reporting on PUCCH is supported
  + FFS: semi-persistent reporting on PUCCH/PUSCH, and aperiodic reporting on PUSCH

**Agreement**

From RAN1 perspective, there is no restriction with regards to the frequency location of CSI-RS used for L1-measurement.

**Agreement**

For CSI-RS based L1-measurement report by gNB scheduled measurement reporting, semi-persistent reporting on PUCCH/PUSCH and aperiodic reporting on PUSCH are supported

**Agreement**

The serving cell RS for event evaluation is at least derived from QCL RS or SSB QCLed with the QCL RS of the indicated joint/DL TCI state for the serving cell

* QCL RS above is the RS w.r.t. QCL-TypeD when the indicated joint/DL TCI state is configured with two QCL RSs
* FFS: Details on determination of QCL RS or SSB QCLed with QCL RS

Note: This does not imply the support of mTRP scenarios

**Conclusion**

There is no consensus in RAN1 on the support L1-SINR measurement based on CSI-RS for candidate cells

**Agreement**

The following alternatives are further studied:

* Alt-1: CSI-RS measurement and CSI reporting operations are performed before reception of LTM Cell Switch Command (CSC) MAC CE.
  + The report is sent to the serving cell and transferred to the candidate/target cell(s)
* Alt-2: CSI-RS measurement can start before reception of LTM CSC MAC CE and CSI reporting operation is performed after reception of LTM CSC MAC CE.
  + The report is sent directly to target cell
* Alt-3: CSI-RS measurement and CSI reporting operations are performed after reception of LTM CSC MAC CE.
  + The report is sent directly to target cell

Companies are requested to provide the details of exact report timing and triggering mechanism in the next meeting

Working Assumption

In addition to periodic CSI-RS, semi-persistent CSI-RS is supported for candidate cell L1-RSRP measurement for gNB scheduled reporting from RAN1 perspective

* Send an LS to RAN3 (CC RAN2) to ask for the feasibility of specifying the signalling for coordination between serving cell and candidate cell(s) on the transmission of semi-persistent CSI-RS(s) and any other potential issues (e.g. RAN3 workload).

Support of semi-persistent CSI-RS is subject to UE capability.

Final LS in R1-2409283.

#### RAN1#119

**Agreement**

For the identification of the serving cell RS for event evaluation,

If the RS(s) for candidate cell(s) are CSI-RS configured in a CSI-RS resource set configured with repetition, QCL RS of the indicated TCI-state is used for the serving cell; otherwise, SSB QCLed with QCL RS of the indicated TCI-state is used for the serving cell.

* UE does not expect the following configuration:
  + CSI-RS resource in the indicated TCI state of serving cell is NOT configured in a CSI-RS resource set configured with repetition, and
  + CSI-RS is configured as measurement resource for the candidate cell(s).

**Agreement**

CSI-RS for BM as the *referenceSignal* with QCL-TypeD is supported for an LTM TCI state, where TRS is configured as *referenceSignal* with QCL-TypeA

**Working Assumption**

As baseline, CSI-RS measurement and CSI reporting operations are performed after reception of LTM CSC MAC CE.

* The report is sent directly to target cell
* Introduce UE capability for CSI-RS measurement can start before reception of LTM CSC MAC CE
  + Other than UE capability, strive for no additional spec impact compared to the baseline (only one triggering mechanism will be specified)

**Conclusion**

* No consensus to support CSI-RS for mobility for L1 measurement in Rel-19 LTM
* Note: From the actual gNB transmission viewpoint, CSI-RS for mobility and CSI-RS for BM may be the same

#### RAN1#120

**Agreement**

* Confirm the following working assumption made in RAN1#118bis

***Working Assumption(RAN1#118bis)***

*In addition to periodic CSI-RS, semi-persistent CSI-RS is supported for candidate cell L1-RSRP measurement for gNB scheduled reporting from RAN1 perspective*

*Send an LS to RAN3 (CC RAN2) to ask for the feasibility of specifying the signalling for coordination between serving cell and candidate cell(s) on the transmission of semi-persistent CSI-RS(s) and any other potential issues (e.g. RAN3 workload).*

*Support of semi-persistent CSI-RS is subject to UE capability.*

* MAC CE is used to activate/deactivate the semi-persistent CSI-RS resource similarly to the legacy mechanism for a serving cell which will be specified in RAN2

Send an LS to RAN2 to inform this agreement. Final LS in R1-2501500.

**Conclusion**

There is no RAN1 consensus to support SP CSI-RS for event triggered reporting

**Conclusion**

There is no consensus on the support of aperiodic CSI-RS resource for gNB scheduled reporting or event triggered reporting

**Agreement**

The parameters defined in legacy *NZP-CSI-RS-resource* can be different for CSI-RS resources associated with the resource set

**Agreement**

An LTM report configuration for L1-RSRP is associated with a single resource config that includes:

* + Alt.A: a single resource set containing CSI-RS resources corresponding to multiple candidate cells. i.e., the same design as that of SSB in Rel-18 LTM.
  + FFS: how to associate between the measurement CSI-RS resources and candidate cells
    - explicit or implicit signaling of candidate cells

**Conclusion**

There is no consensus in RAN1 to support specified filtering of L1-RSRP for LTM.

Send an LS to RAN2 to inform that L1 filtering is up to UE implementation. Final LS in R1-2501577.

**Agreement**

For target cell CSI acquisition,

1. A UE is provided with RRC configurations for periodic CSI-RS resource(s) and CSI report(s) for one or more candidate cell
   * For a candidate cell,
     + down-select from the following alternatives:
       - Alt 1: A single CSI report configuration is configured
       - Alt 2: Multiple CSI report configurations can be configured
     + down-select from the following alternatives:
       - Alt X: A single CSI-RS resource for CMR is associated with a CSI report configuration
       - Alt Y: Multiple CSI-RS resources for CMR can be associated with a CSI report configuration
   * FFS: Semi-persistent CSI-RS resource
2. After the RRC configuration and before the reception of CSC, the UE may measure CSI based on the configured CSI-RS resource(s), which is subject to UE capability
   * FFS: whether or how to select a subset of CSI-RS resources to measure
   * FFS: when the UE may start measuring the configured CSI-RS resources
3. UE determines the CSI report configuration based on the CSC
4. After the reception of cell switch command, the UE may measure (depending on the timeline) CSI-RS resource(s) associated with determined CSI report configuration
5. The latest available measured CSI on target cell resource(s) is conveyed at least by a single report, and the report is sent to the target cell
   * Option 1: to use UCI
   * Option 2: to use MAC CE

Note: with this agreement, the working assumption made in RAN1#119 is automatically confirmed.

**Conclusion**

The following is up to RAN2: Coexistence of LTM event triggered reporting and mTRP operation at serving cells

#### RAN1#120bis

**Agreement**

* *Repetition=off* is supported for candidate cell CSI-RS in Rel-19.
* *Repetition=on* is not supported for candidate cell CSI-RS in Rel-19.

**Conclusion**

RAN1 assumes the SSB QCLed with CSI-RS is used for timing reference of candidate cell CSI-RS measurement in LTM.

**Agreement**

In the resource set configured for candidate cell L1-RSRP measurement, a sequence of candidate cell indices is included together with a sequence of CSI-RS resource indices, where each CSI-RS resource index is associated with one candidate cell index.

**Agreement**

Regarding the LS from RAN2 (R1-2501686) the following contents are included in the reply LS.

* RAN1 assumes at maximum 16 beams can be reported by a single event triggered reporting
  + Regardless whether or not the report includes the current beam
  + Note: The maximum number of beams that can be reported by a UE subject to UE capability is under discussion in RAN1

**Agreement**

For candidate cell CSI acquisition

* In addition to periodic CSI-RS resource, semi-persistent CSI-RS resource is supported
  + Support of semi-persistent CSI-RS resource is subject to separate UE capability.
* MAC CE is used to activate/deactivate the semi-persistent CSI-RS resource similarly to the legacy mechanism for a serving cell which will be specified in RAN2

Send an LS to RAN2 and RAN3 to inform this agreement

**R1-2503076** [Draft] Reply LS on number of beam measurements in the measurement report MAC CE Moderator (Fujitsu)

**Agreement**

Reply LS on number of beam measurements in the measurement report MAC CE is agreed.

*RAN1 would like to thank RAN2 for their LS on number of beam measurements in the measurement report MAC CE.*

*RAN1 assumes at maximum 16 beams can be reported by a single event triggered reporting regardless whether or not the report includes the current beam. It is noted that the maximum number of beams that can be reported by a UE is subject to UE capability which is under discussion in RAN1.*

Final LS in R1-2503077.

**R1-2503078** [Draft] LS on the support of semi-persistent CSI-RS resource for LTM CSI acquisition for candidate cells Moderator (Fujitsu)

**Agreement**

LS on the support of semi-persistent CSI-RS resource for LTM CSI acquisition for candidate cells is agreed. Final LS in R1-2503079.

**Agreement**

For the RS type determination for event triggered reporting with event LTM2,

* Alt 1-2: At least one candidate RS shall be configured

**Agreement**

For the container of LTM CSI report to a target cell, UCI is used with a solution to avoid blind detection at gNB if valid CSI is not available

* FFS: the definition of valid CSI

**Agreement**

For the solution to avoid blind detection for LTM CSI report if valid CSI is not available,

* Option 1: CSI is reported when valid CSI is not available
  + Option 1-1: one CQI codepoint is used to indicate that valid CSI is not available
    - Option 1-1-1: Codepoint with the lowest CQI index is reported

**Agreement**

Regarding CSI acquisition, for a candidate cell,

* A single CSI report configuration is configured
* Multiple CSI-RS resources for CMR can be associated with the CSI report configuration
  + The number of CSI-RS resources for CMR is subject to UE capability

**Agreement**

Following restrictions are introduced

* For the codebook configurations in report configuration, *typeI-SinglePanel* is supported for LTM CSI acquisition
* For report frequency configuration in report configuration, wideband CQI and wideband PMI are supported for LTM CSI acquisition
* For the report quantity in report configuration, *cri-RI-PMI-CQI* is supported for LTM CSI acquisition
  + The supported max rank is up to separate UE capability
* For the number of CSI-RS ports of CSI-RS resource(s) associated with a CSI report configuration for a candidate cell for LTM CSI acquisition
  + Up to 128 ports is supported
  + The supported max number of CSI-RS ports is up to separate UE capability