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

Electronic Meeting, April 20th – 30th 2020

Agenda Item: 6.0.1

Source: Ericsson

Title: [AT109bis-e][072][NR RIL] DiscMail11 + DiscMail12 (Ericsson)

Document for: Discussion, Decision

# Introduction

This document is to kick off the following email discussion:

* [AT109bis-e][072][NR RIL] DiscMail11 + DiscMail12 (Ericsson)

Scope: Discussion and implementation of review issues.

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

Deadline: **Email discussion Stop at EOM, April 30 (short extension 1 week could be considered if needed).**

The following issues are addressed in this document:

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Work Item** | **Section** | **Rapporteur Comment** |
| Z302 | DCCA | 5.3.5.3 Reception of an RRCReconfiguration by the UE |  |
| E038 | DCCA, MobEnh | 5.3.10.3 Detection of radio link failure | Discussion ongoing in WI MobEnh, need not be discussed here. |
| E008 | MDT, NR-U | 5.3.10.3 Detection of radio link failure | Discussed in WI MDT/SON session, need not be discussed here. |
| I904 | NR\_unlic-Core | 5.3.10.3 Detection of radio link failure |  |
| Q010 | TEI | 5.3.10.3 Detection of radio link failure |  |
| I905 | NR\_unlic-Core | 5.3.10.3 Detection of radio link failure |  |
| E055 | CLI, GEN | 5.5.3.2 Layer 3 filtering |  |
| I906 | NR\_unlic-Core | 5.7.3.5 Actions related to transmission of SCGFailureInformation message |  |
| Q011 | TEI | 5.7.6.3 Reception of DLDedicatedMessageSegment by the UE |  |
| S402 | PowSave | – PDSCH-Config, maxMIMO-Layers-r16 |  |
| I679 | NR-U | – PhysicalCellGroupConfig, nfi-TotalDAI-Included-r16 etc |  |
| S657 | MIMO | – PTRS-DownlinkConfig | Discussed in MIMO session, agreement to be included in MIMO WI CR, need not be discussd here. |
| I648 | NR-U | – PUCCH-Config, resourceToAddModList |  |
| I649 | MIMO | – PUCCH-Config, spatialRelationInfoToAddModList |  |
| Q007 | 2Step RA/TEI | – RACH-ConfigCommonTwoStepRA, ra-Prioritization-r16 |  |
| Q008 | 2Step RA/TEI | – RACH-ConfigCommonTwoStepRA, ra-PrioritizationForAI-r16 |  |

# ASN.1

## Z302

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| --- | --- | --- | --- | --- | --- | --- |
| Z302 | ZTE (LiuJing) | DCCA | 2 | None | There are similar description in section 5.3.5.3 (see below), we suggest to remove one of them. 2> if the RRCReconfiguration message was included in an RCResume message: 3> include the RRCReconfigurationComplete message in the nr-SCG-Response within the scg-Response in the RRCResumeComplete message; 2> if the RRCReconfiguration message was included in E-UTRA RRCConnectionResume message: 3> include the RRCReconfigurationComplete message in the E-UTRA MCG RRC message RRCConnectionResumeComplete in accordance with TS 36.313 [10], clause 5.3.3.4a; | Remove the following sentences from this section. 2> if the RRCResume message includes the mrdc-SecondaryCellGroupConfig with mrdc-SecondaryCellGroup set to eutra-SCG: 3> include in the eutra-SCG-Response the E-UTRA RRCConnectionReconfigurationComplete message in accordance with TS 36.331 [10] clause 5.3.5.3; 2> if the RRCResume message includes the mrdc-SecondaryCellGroupConfig with mrdc-SecondaryCellGroup set to nr-SCG: 3> include in the nr-SCG-Response the SCG RRCReconfigurationComplete message; |

5.3.5.3 Reception of an *RRCReconfiguration* by the UE

<Cut>

1> set the content of the *RRCReconfigurationComplete* message as follows:

2> if the *RRCReconfiguration* includes the *masterCellGroup* containing the *reportUplinkTxDirectCurrent*:

3> include the *uplinkTxDirectCurrentList* for each MCG serving cell with UL;

3> include *uplinkDirectCurrentBWP-SUL* for each MCG serving cell configured with SUL carrier, if any, within the *uplinkTxDirectCurrentList*;

2> if the *RRCReconfiguration* includes the *secondaryCellGroup* containing the *reportUplinkTxDirectCurrent*:

3> include the *uplinkTxDirectCurrentList* for each SCG serving cell with UL;

3> include *uplinkDirectCurrentBWP-SUL* for each SCG serving cell configured with SUL carrier, if any, within the *uplinkTxDirectCurrentList*;

2> if the *RRCReconfiguration* message was included in an *RRCResume* message:

3> include the *RRCReconfigurationComplete* message in the *nr-SCG-Response* within the *scg-Response* in the *RRCResumeComplete* message;

2> if the *RRCReconfiguration* message was included in E-UTRA *RRCConnectionResume* message:

3> include the *RRCReconfigurationComplete* message in the E-UTRA MCG RRC message *RRCConnectionResumeComplete* in accordance with TS 36.313 [10], clause 5.3.3.4a;

2> if the *RRCReconfiguration* is applied due to a conditional configuration execution and included a s*econdaryCellGroupConfig*:

3> if the applied *RRCReconfiguration* message was received via SRB1:

4> if the applied *RRCReconfiguration* message was received via E-UTRAN:

5> FFS;

<cut>

**Rapporteur:**

**We noted the text proposed to be deleted is Rel-15 text. So the proposed change in this RIL should be Rejected, and other proposal related to this can be discussed**

**We ask companies to comment on**

1. **Reject the proposal in the RIL**
2. **Discuss if other change of proceduure text is needed in this context.**

**Z302: Please provide your comments.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| ZTE | see comment | Seems we put this RIL in wrong place and proposed wrong solution. Sorry. It should be in 5.3.13.4 (we raised the issue during email disc[Post109e#37], and the rapporteur suggests to discuss it during ASN.1 review).  In section 5.3.13.4, we had the following duplicated descriptions:   1. The yellow highlight part is duplicated with section 5.3.5.3 in TS38.331. (see above yellow part provided by the rapporteur) 2. The green highlight part is duplicated with section 5.3.5.3 in TS36.331.   So we suggest to remove the descriptions from section 5.3.13.4. 5.3.13.4 Reception of the *RRCResume* by the UE \*\*skip non-related part\*\*  3> else if the SIB1 contains *idleModeMeasurements*:  4> include the *idleMeasAvailable*;  ~~2> if the~~ *~~RRCResume~~* ~~message includes the~~ *~~mrdc-SecondaryCellGroupConfig~~* ~~with~~ *~~mrdc-SecondaryCellGroup~~* ~~set to~~ *~~eutra-SCG~~*~~:~~  ~~3> include in the~~ *~~eutra-SCG-Response~~* ~~the E-UTRA~~ *~~RRCConnectionReconfigurationComplete~~* ~~message in accordance with TS 36.331 [10] clause 5.3.5.3;~~  ~~2> if the~~ *~~RRCResume~~* ~~message includes the~~ *~~mrdc-SecondaryCellGroupConfig~~* ~~with~~ *~~mrdc-SecondaryCellGroup~~* ~~set to~~ *~~nr-SCG~~*~~:~~  ~~3> include in the~~ *~~nr-SCG-Response~~* ~~the SCG~~ *~~RRCReconfigurationComplete~~* ~~message;~~  2> if the UE has logged measurements available for NR and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:  3> include the *logMeasAvailable* in the *RRCResumeComplete* message*;*  <cut>  #TS 36.331 (for reference)  5.3.5.3 Reception of an *RRCConnectionReconfiguration* not including the *mobilityControlInfo* by the UE  \*\*skip non-related part\*\*  2> if the received *RRCConnectionReconfiguration* message was included in an NR *RRCResume* message:  3> include the *RRCConnectionReconfigurationComplete* message in the NR MCG RRC message *RRCResumeComplete* in accordance with TS 38.331 [82], clause 5.3.13.4;  <cut> |
|  | For further discussion | We think the proposed changes are not aligned with R15 but some changes are needed to align with R15. We need more time to think about it. If the green part is removed, NE-DC seems has no where to refer to.  In the case of reconfiguation for NR-DC (R15), the setting of the SCG RRCReconfigurationComplete messge in the MCG message is executed when 5.3.5.3 is executed for the MCG.  To align with this for resume, the setting of SCG RRCReconfigurationComplete message in the MCG message should be in 5.3.13.4 (it is indeed there) and the following should be removed from 5.3.5.3:  ~~2>  if the~~ *~~RRCReconfiguration~~* ~~message was included in an~~ *~~RRCResume~~* ~~message:~~  ~~3>  include the~~ *~~RRCReconfigurationComplete~~* ~~message in the~~ *~~nr-SCG-Response~~* ~~within the~~ *~~scg-Response~~* ~~in the~~ *~~RRCResumeComplete~~* ~~message;~~  In the case of NGEN-DC, for reconfiguration, there is a statement in 5.3.5.3 when it is executed for the SCG:  1>  if the UE is configured with E-UTRA *nr-SecondaryCellGroupConfig* (UE in (NG)EN-DC):  2>  if the *RRCReconfiguration* message was received via E-UTRA SRB1 as specified in TS 36.331 [10]; or  2>  if the *RRCReconfiguration* message was received via SRB3 within *DLInformationTransferMRDC*  3>  submit the *RRCReconfigurationComplete* via E-UTRA embedded in E-UTRA RRC message *RRCConnectionReconfigurationComplete* as specified in TS 36.331 [10], clause 5.3.5.3/5.3.5.4;  For resume in NGEN-DC, the statement is:  2>  if the *RRCReconfiguration* message was included in E-UTRA *RRCConnectionResume* message:  3>  include the *RRCReconfigurationComplete* message in the E-UTRA MCG RRC message *RRCConnectionResumeComplete* in accordance with TS 36.313 [10], clause 5.3.3.4a;  In general, we find the R16 wording clearer than the R15 wording but maybe we should align R16 with R15.  2>  if the *RRCReconfiguration* message was included in E-UTRA *RRCConnectionResume* message:  3>  ~~include~~submit the *RRCReconfigurationComplete* message via E-UTRA embedded in the E-UTRA MCG RRC message *RRCConnectionResumeComplete* in accordance with TS 36.313 [10], clause 5.3.3.4a; |
| MediaTek | Suggest to postpone | This dose not looks like that a critical issue and it is not releatd to ASN.1. In general, it seems that the current text is fine although there may be duplication. I guess further discussion is needed. |
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## E038, I904, Q010, I905

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| |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | E038 | Ericsson (Tony) | | DCCA, MobEnh | | 2 | | R2-2003201 | | In the procedural text in 5.3.10.3 there are different handling on whether dapsConfig is configured or not. However, in case daspConfig is configured and there is a failure on the MCG, the MCG failure procedure should be called. Further, the related part on dasp can be merged into the existing text thus avoid unnecessary and confusing procedural text. We will bring a draft CR addressing this issue. | |  | | I904 | Intel (Seau Sian) | | NR\_unlic-Core | | 2 | | None | | Text is not aligned with the others like: upon random access problem indication from MCG MAC while neither T300, T301, T304, T311 nor T319 are running | | Propose to change to: upon consistent uplink LBT failure indication from MCG MAC or upon indication from MCG MAC that consistent uplink LBT failure has occurred | | Q010 | Qualcomm (Masato) | TEI | | 2 | | None | | This is about discarding "stored" segments. | | Change as follows. 3> discard any segments of segmented RRC messages received stored according to 5.7.6.3 | | |  |  | 2 | None | This is about discarding "stored" segments. | Change as follows. 3> discard any segments of segmented RRC messages received stored according to 5.7.6.3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| I905 | Intel (Seau Sian) | NR\_unlic-Core | 2 | None | Text is not aligned with the others like: upon random access problem indication from SCG MAC | Propose to change to: upon consistent uplink LBT failure indication from SCG MAC or upon indication from SCG MAC that consistent uplink LBT failure has occurred |

**Text proposal:**

5.3.10.3 Detection of radio link failure

The UE shall:

1> if *dapsConfig* is configured for any DRB:

2> upon T310 expiry in source; or

2> upon random access problem indication from source MCG MAC; or

2> upon indication from source MCG RLC that the maximum number of retransmissions has been reached:

3> consider radio link failure to be detected for the source MCG i.e. source RLF;

4> suspend all DRBs in the source;

4> release the source connection.

1> else:

2> upon T310 expiry in PCell; or

2> upon T312 expiry in PCell; or

2> upon random access problem indication from MCG MAC while neither T300, T301, T304, T311 nor T319 are running; or

2> upon indication from MCG RLC that the maximum number of retransmissions has been reached; or

2> upon indication from SCG MAC that consistent uplink LBT failure has occurred, or

2> if connected as an IAB-node, upon BH RLF indication received on BAP entity from the MCG:

3> if the indication is from MCG RLC and CA duplication is configured and activated, and for the corresponding logical channel *allowedServingCells* only includes SCell(s):

4> initiate the failure information procedure as specified in 5.7.5 to report RLC failure.

3> else:

4> consider radio link failure to be detected for the MCG i.e. RLF;

4> discard any segments of segmented RRC messages received;

4> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:

<cut>

The UE shall:

1> upon T310 expiry in PSCell; or

1> upon T312 expiry in PSCell; or

1> upon random access problem indication from SCG MAC; or

1> upon indication from SCG RLC that the maximum number of retransmissions has been reached; or

1. upon indication from SCG MAC that consistent uplink LBT failure has occurred, or

1> if connected as an IAB-node, upon BH RLF failure indication received on BAP entity from the SCG;

1>

2> if the indication is from SCG RLC and CA duplication is configured and activated; and for the corresponding logical channel *allowedServingCells* only includes SCell(s):

3> initiate the failure information procedure as specified in 5.7.5 to report RLC failure.

2> else if MCG transmission is not suspended:

3> consider radio link failure to be detected for the SCG, i.e. SCG RLF;

3> initiate the SCG failure information procedure as specified in 5.7.3 to report SCG radio link failure.

2> else:

3> if the UE is in NR-DC:

4> initiate the connection re-establishment procedure as specified in 5.3.7;

3> else (the UE is in (NG)EN-DC):

4> initiate the connection re-establishment procedure as specified in TS 36.331 [10], clause 5.3.7;

**E038, Rappporteur:** **There is open discussion in WI eMOB, proposed to await outcome and not discuss the issue here.**

**I904: Do companies agree Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | Yes | This looks like an editorial change and we are fine with it. |
| OPPO | Yes | We can align the text |
| Qualcomm Incorporated | Yes |  |
| MediaTek | Yes | Looks like wording impromvement |
|  |  |  |

**Q010: Do companies agree Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | Yes | Stored seems a more accurate wording. |
| OPPO | Yes |  |
| MediaTek | Yes | “Stored” is more accurate |
|  |  |  |

**I905: Do companies agree Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | Yes | This looks like an editorial change and we are fine with it. |
| OPPO | Yes | We can align the text |
| Qualcomm Incorporated | Yes |  |
| MediaTek | Yes |  |
|  |  |  |

## E055

**[Description]:**

The procedural text captures the following:

… for other measurements, *a* = 1/2(*k*/4), where *k* is the *filterCoefficient* for the corresponding measurement quantity received by the *quantityConfig;…*

This description is used for EUTRA and CLI related measurements. The existing text was referring only to EUTRA measurements and it was clear as to which field should be used (*quantityConfigEUTRA* in *quantityConfig*). In the current specification, it is confusing as to which ‘corresponding’ field to be used.

**Text Proposal:**

5.5.3.2 Layer 3 filtering

The UE shall:

1> for each cell measurement quantity, each beam measurement quantity and for each CLI measurement quantity that the UE performs measurements according to 5.5.3.1:

2> filter the measured result, before using for evaluation of reporting criteria or for measurement reporting, by the following formula:

***F*n = (1 – *a*)\**F*n-1 + *a*\**M*n**

where

***Mn*** is the latest received measurement result from the physical layer;

***Fn*** is the updated filtered measurement result, that is used for evaluation of reporting criteria or for measurement reporting;

***Fn-1*** is the old filtered measurement result, where ***F0*** is set to ***M1*** when the first measurement result from the physical layer is received; and for *MeasObjectNR*, ***a*** = 1/2(***ki***/4), where ***ki*** is the *filterCoefficient* for the corresponding measurement quantity of the i:th *QuantityConfigNR* in *quantityConfigNR-List*, and *i* is indicated by *quantityConfigIndex* in *MeasObjectNR*; for *measObjectEUTRA*, ***a*** = 1/2(***k***/4), where ***k*** is the *filterCoefficient* for the corresponding measurement quantity received by *quantityConfigEUTRA* in the *quantityConfig*; for *MeasObjectCLI*, ***a*** = 1/2(***k***/4), where ***k*** is the *filterCoefficient* for the corresponding measurement quantity received by *quantityConfigCLI* in the *quantityConfig*; for *MeasObject*UTRA-FDD, a = 1/2(k/4), where k is the filterCoefficient for the corresponding measurement quantity received by *quantityConfigUTRA-FDD* in the *QuantityConfig*;

2> adapt the filter such that the time characteristics of the filter are preserved at different input rates, observing that the *filterCoefficient k* assumes a sample rate equal to X ms; The value of X is equivalent to one intra-frequency L1 measurement period as defined in TS 38.133 [14] assuming non-DRX operation, and depends on frequency range.

<cut>

**E055: Do companies agree to to Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| ZTE | Yes | The proposed TP looks more clear, we agree. |
| Huawei, Hisilicon | Yes | We think this is to make an accurate description and is fine to have it. |
| Qualcomm Incorporated | Yes |  |
| MediaTek | Yes |  |
| Lenovo | Yes |  |

## I906

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| I906 | Intel (Seau Sian) | NR\_unlic-Core | 2 | None | Need to add the following for NRNR-u DC case as LBT may occur on SCG : 1> else if the UE initiates transmission of the SCGFailureInformation message due to consistent uplink LBT failures: 2> set the failureType as scg-lbtFailure. | Propose to add: 1> else if the UE initiates transmission of the SCGFailureInformation message due to consistent uplink LBT failures: 2> set the failureType as scg-lbtFailure. |

5.7.3.5 Actions related to transmission of *SCGFailureInformation* message

The UE shall set the contents of the *SCGFailureInformation* message as follows:

1> if the UE initiates transmission of the *SCGFailureInformation* message due to T310 expiry:

2> set the *failureType* as *t310-Expiry*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to T312 expiry:

2> set the *failureType* as *t312-Expiry*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide reconfiguration with sync failure information for an SCG:

2> set the *failureType* as *synchReconfigFailure-SCG*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide random access problem indication from SCG MAC:

2> set the *failureType* as *randomAccessProblem*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide indication from SCG RLC that the maximum number of retransmissions has been reached:

2> set the *failureType* as *rlc-MaxNumRetx*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to SRB3 IP check failure:

2> set the *failureType* as *srb3-IntegrityFailure*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to Reconfiguration failure of NR RRC reconfiguration message:

2> set the failureType as scg-reconfigFailure.

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to consistent uplink LBT failures:

2> set the *failureType* as *scg-lbtFailure*.

1> include and set *MeasResultSCG*-Failure in accordance with 5.7.3.4;

1> for each *MeasObjectNR* configured by a *MeasConfig* associated with the MCG, and for which measurement results are available:

2> include an entry in *measResultFreqList*;

**<cut>**

**I906: Do companies agree on Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, Hisilicon | No | We think this has already been covered in 5.7.3.3?  1>  else if the UE initiates transmission of the *SCGFailureInformationNR* message due to Reconfiguration failure of NR RRC reconfiguration message:  2>  set the *failureType* as *scg-reconfigFailure*.  1>  else if the UE initiates transmission of the *SCGFailureInformationNR* message due to consistent uplink LBT failures:  2>  set the *failureType* as *scg-lbtFailure*. |
| OPPO | Yes | It seems we miss this part for the case of NR-NRU-DC case |
| Intel | Yes | But this will probably be handled in the WI CR per agreement from NR-u session for NR-DC:  (Issue U555) Introduce text for setting failureType as scg-lbtFailure in 5.7.3.5 (corresponding to NR-NRU DC)  5.7.3.3 is just for EN-DC |
| Qualcomm Incorporated | Yes | 5.7.3.3 is only for EN-DC. |
| MediaTek | Yes |  |
|  |  |  |

## Q011

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| --- | --- | --- | --- | --- | --- | --- |
| Q011 | Qualcomm (Masato) | TEI | 2 | None | The text can be a bit more specific what the segment is, e.g. by aligning with the ASN.1 field description. | Change as follows. 1> store the segment of the encoded DL DCCH message included in rrc-MessageSegmentContainer: |

**Text proposal:**

5.7.6.3 Reception of *DLDedicatedMessageSegment* by the UE

Upon receiving *DLDedicatedMessageSegment* message, the UE shall:

1> store the segment of the encoded DL DCCH message included in *rrc-MessageSegmentContainer*;

1> if all segments of the message have been received:

2> assemble the message from the received segments and process the message according to 5.3.5.3 for the *RRCReconfiguration* message or 5.3.13.4 for the *RRCResume* message;

2> discard all segments.

**Q011: Do companies agree on Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | Yes | It is clearer to define the specific segments. |
| ZTE | Yes | Agree with the proposed change to clearly specify what the segement is. |
| MediaTek | Yes |  |
| Lenovo | Yes but | We can keep it simple as it is already described in the field description of rrc-MessageSegmentContainer that it includes a segment of the encoded DL DCCH message. So, our proposal is to say:  “store the segment included in *rrc-MessageSegmentContainer*;” |

## S402

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S402 | Samsung (soenghun Kim) | PowSave | 2 | None | Need code is Need M while IE is INTEGER. Should be SetupRelease to be able to release it. | maxMIMO-Layers-r16 SetupRelease { maxMIMO-Layers } OPTIONAL, -- Need M [Comments]: |

Text proposal:

***PDSCH-Config* information element**

-- ASN1START

-- TAG-PDSCH-CONFIG-START

PDSCH-Config ::= SEQUENCE {

dataScramblingIdentityPDSCH INTEGER (0..1023) OPTIONAL, -- Need S

<CUT>

sp-ZP-CSI-RS-ResourceSetsToReleaseList SEQUENCE (SIZE (1..maxNrofZP-CSI-RS-ResourceSets)) OF ZP-CSI-RS-ResourceSetId

OPTIONAL, -- Need N

p-ZP-CSI-RS-ResourceSet SetupRelease { ZP-CSI-RS-ResourceSet }

OPTIONAL, -- Need M

...,

[[

maxMIMO-Layers-r16 SetupRelease { MaxMIMO-LayersDL-r16 } OPTIONAL, -- Need M

minimumSchedulingOffsetK0-r16 SetupRelease { MinSchedulingOffsetK0-Values-r16 } OPTIONAL, -- Need M

prb-BundlingTypeForDCI-Format1-2-r16 CHOICE {

staticBundling-r16 SEQUENCE {

bundleSize-r16 ENUMERATED { n4, wideband } OPTIONAL -- Need S

<CUT>

pdsch-TimeDomainAllocationList-v16xy SetupRelease { PDSCH-TimeDomainResourceAllocationList-v16xy } OPTIONAL, -- Need M

repetitionSchemeConfig-r16 SetupRelease { RepetitionSchemeConfig-r16} OPTIONAL -- Need M

]]

}

RateMatchPatternGroup ::= SEQUENCE (SIZE (1..maxNrofRateMatchPatternsPerGroup)) OF CHOICE {

cellLevel RateMatchPatternId,

bwpLevel RateMatchPatternId

}

MaxMIMO-LayersDL-r16 ::= INTEGER (1..8)

MinSchedulingOffsetK0-Values-r16 ::= SEQUENCE (SIZE (1..maxNrOfMinSchedulingOffsetValues-r16)) OF INTEGER (0..maxK0-SchedulingOffset-r16)

-- TAG-PDSCH-CONFIG-STOP

-- ASN1STOP

We noted that also max-MIMO-Layers in PDSCH-ServingCellConfig could use this new-defined IE MaxMIMO-LayersDL-r16, to be consistent. But Rapporteur proposes not to do this change.

PDSCH-ServingCellConfig ::= SEQUENCE {

codeBlockGroupTransmission SetupRelease { PDSCH-CodeBlockGroupTransmission } OPTIONAL, -- Need M

xOverhead ENUMERATED { xOh6, xOh12, xOh18 } OPTIONAL, -- Need S

nrofHARQ-ProcessesForPDSCH ENUMERATED {n2, n4, n6, n10, n12, n16} OPTIONAL, -- Need S

pucch-Cell ServCellIndex OPTIONAL, -- Cond SCellAddOnly

...,

[[

maxMIMO-Layers INTEGER (1..8) OPTIONAL, -- Need M

processingType2Enabled BOOLEAN OPTIONAL -- Need M

]],

[[

pdsch-CodeBlockGroupTransmissionList-r16 SetupRelease { PDSCH-CodeBlockGroupTransmissionList-r16 } OPTIONAL -- Need M

]]

}

**S402: Do companies agree Text Proposal above, and to not change PDSCH-ServingCellConfig?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | Yes | We are fine to use setuprelease for Rel-16 IEs, but we should not touch Rel-15 signaling and we agree with the rapporteur that the Rel-15 part should not be changed. |
| Qualcomm Incorporated | Yes |  |
| MediaTek | Yes | In general, it is good allow NW to release the configuration. But we also prefer not to change the Rel-15 ASN.1. |
|  |  |  |

## I679

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| I679 | Intel (Sudeep) |  | 2 | None | ENUMERATED true Need M cannot be released once configured. | Consider changing to Need R or BOOLEAN. |

Text Proposal:

-- ASN1START

-- TAG-PHYSICALCELLGROUPCONFIG-START

PhysicalCellGroupConfig ::= SEQUENCE {

harq-ACK-SpatialBundlingPUCCH ENUMERATED {true} OPTIONAL, -- Need S

<cut>

harq-ACK-SpatialBundlingPUSCH-secondaryPUCCH-group-r16 ENUMERATED {true} OPTIONAL, -- Cond twoPUCCHgroup

pdsch-HARQ-ACK-Codebook-secondaryPUCCH-group-r16 ENUMERATED {semiStatic, dynamic} OPTIONAL, -- Cond twoPUCCHgroup

p-NR-FR2-r16 P-Max OPTIONAL, -- Need R

p-UE-FR2-r16 P-Max OPTIONAL, -- Cond MCG-Only

nrdc-PCmode-FR1-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic} OPTIONAL, -- Cond MCG-Only

nrdc-PCmode-FR2-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic} OPTIONAL, -- Cond MCG-Only

pdsch-HARQ-ACK-Codebook-r16 ENUMERATED {enhancedDynamic, spare1} OPTIONAL, -- Need R

nfi-TotalDAI-Included-r16 ENUMERATED {true} OPTIONAL, -- Need R

ul-TotalDAI-Included-r16 ENUMERATED {true} OPTIONAL, -- Need R

pdsch-HARQ-ACK-OneShotFeedback-r16 ENUMERATED {true} OPTIONAL, -- Need R

pdsch-HARQ-ACK-OneShotFeedbackNDI-r16 ENUMERATED {true} OPTIONAL, -- Need R

pdsch-HARQ-ACK-OneShotFeedbackCBG-r16 ENUMERATED {true} OPTIONAL, -- Need R

downlinkAssignmentIndexForDCI-Format0-2-r16 ENUMERATED { enabled } OPTIONAL, -- Need S

downlinkAssignmentIndexForDCI-Format1-2-r16 ENUMERATED {n1, n2, n4} OPTIONAL, -- Need S

pdsch-HARQ-ACK-CodebookList-r16 SetupRelease {PDSCH-HARQ-ACK-CodebookList-r16} OPTIONAL, -- Need M

ackNackFeedbackMode-r16 ENUMERATED {joint, separate} OPTIONAL -- Need R

]]

}

<cut>

-- TAG-PHYSICALCELLGROUPCONFIG-STOP

-- ASN1STOP

**I679: Do companies agree on Text Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | Yes | We agree with the principle, maybe better to check from RAN1 point of view whether it is a one shot configuration or not. |
| Qualcomm Incorporated | Yes |  |
| MediaTek | Yes |  |
|  |  |  |

## S657

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S657 | Samsung (Seungri Jin) | MIMO | 2 | None | According to RAN1 (R1-2001478), this field is only configured for single-PDCCH based multi-TRP operation. | Add this condition in the field description or make this field as OPTIONAL with Cond sPDCCH-mTRP i.e. need the description for this condition. |

Rapporteur: Discussed in MIMO session, agreement to be included in MIMO WI CR:

1. Agree with the proposed change

a) Change the signalling of maxNrofPorts from ENUMERATED {n2} to ENUMERATED {n1, n2}

b) add the condition when n2 can be selected in the field description: 2 PT-RS ports can only be configured for single-PDCCH based multi-TRP operation.

Rapporteur proposes not to dicuss S657 here in this email discussion.

## I648

|  |
| --- |
| ***resourceToAddModList, resourceToReleaseList***  Lists for adding and releasing PUCCH resources applicable for the UL BWP and serving cell in which the *PUCCH-Config* is defined. The resources defined herein are referred to from other parts of the configuration to determine which resource the UE shall use for which report. |

The Rapporteur’s understanding is that network configures either *resourceToAddModList* (without suffix) or *resourceToAddModList-16*, there is never a mix. Since max number of PUCCH resource is the same, both *PUCCH-Resource* (without suffix) and *PUCCH-Resource-16* have a *PUCCH-ResourceId* (without suffix). Only one toRelease list seems needed.

Since the term “the network configures the field…” means that the network included the field in this or a previous message, the intended behaviour could be captured by adding the following to the field description:

|  |
| --- |
| ***resourceToAddModList, resourceToReleaseList***  Lists for adding and releasing PUCCH resources applicable for the UL BWP and serving cell in which the *PUCCH-Config* is defined. The resources defined herein are referred to from other parts of the configuration to determine which resource the UE shall use for which report. The network configures either *resourceToAddModList* (without suffix) or *resourceToAddModList-r16*. |

**I648: Please provide your comments on the discussion and Text Proposal.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | To be further discussed | We think it perhaps worth a discussion on whether we should have some generic principle on this issue. We have one contribution in R2-2003716 in 2.1.2 which is for searchSpacesToAddModList but can be adopted as it is for this field as this is exactly the same situation (as discussed in the paper). |
| MediaTek | Further discussed | This is an issue that we have to clarify. We are fine to discuss more genral rule based on HW paper. |
|  |  |  |

## I649

|  |
| --- |
| ***spatialRelationInfoToAddModList***  Configuration of the spatial relation between a reference RS and PUCCH. Reference RS can be SSB/CSI-RS/SRS. If the list has more than one element, MAC-CE selects a single element (see TS 38.321 [3], clause 5.18.8 and TS 38.213 [13], clause 9.2.2). |

-- ASN1START

-- TAG-PUCCH-CONFIG-START

PUCCH-Config ::= SEQUENCE {

resourceSetToAddModList SEQUENCE (SIZE (1..maxNrofPUCCH-ResourceSets)) OF PUCCH-ResourceSet OPTIONAL, -- Need N

resourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofPUCCH-ResourceSets)) OF PUCCH-ResourceSetId OPTIONAL, -- Need N

resourceToAddModList SEQUENCE (SIZE (1..maxNrofPUCCH-Resources)) OF PUCCH-Resource OPTIONAL, -- Need N

resourceToReleaseList SEQUENCE (SIZE (1..maxNrofPUCCH-Resources)) OF PUCCH-ResourceId OPTIONAL, -- Need N

format1 SetupRelease { PUCCH-FormatConfig } OPTIONAL, -- Need M

format2 SetupRelease { PUCCH-FormatConfig } OPTIONAL, -- Need M

format3 SetupRelease { PUCCH-FormatConfig } OPTIONAL, -- Need M

format4 SetupRelease { PUCCH-FormatConfig } OPTIONAL, -- Need M

schedulingRequestResourceToAddModList SEQUENCE (SIZE (1..maxNrofSR-Resources)) OF SchedulingRequestResourceConfig

OPTIONAL, -- Need N

schedulingRequestResourceToReleaseList SEQUENCE (SIZE (1..maxNrofSR-Resources)) OF SchedulingRequestResourceId

OPTIONAL, -- Need N

multi-CSI-PUCCH-ResourceList SEQUENCE (SIZE (1..2)) OF PUCCH-ResourceId OPTIONAL, -- Need M

dl-DataToUL-ACK SEQUENCE (SIZE (1..8)) OF INTEGER (0..15) OPTIONAL, -- Need M

spatialRelationInfoToAddModList SEQUENCE (SIZE (1..maxNrofSpatialRelationInfos)) OF PUCCH-SpatialRelationInfo

OPTIONAL, -- Need N

spatialRelationInfoToReleaseList SEQUENCE (SIZE (1..maxNrofSpatialRelationInfos)) OF PUCCH-SpatialRelationInfoId

OPTIONAL, -- Need N

pucch-PowerControl PUCCH-PowerControl OPTIONAL, -- Need M

...,

[[

resourceToAddModList-r16 SEQUENCE (SIZE (1..maxNrofPUCCH-Resources)) OF PUCCH-Resource-r16 OPTIONAL, -- Need N

dl-DataToUL-ACK-r16 SEQUENCE (SIZE (1..8)) OF INTEGER (-1..15) OPTIONAL, -- Need M

dl-DCI-triggered-UL-ChannelAccess-CPext-r16 SEQUENCE (SIZE (1..16)) OF INTEGER (0..15) OPTIONAL, -- Need M

subslotLengthForPUCCH-r16 ENUMERATED {n2,n7} OPTIONAL, -- Need M

dl-DataToUL-ACK-ForDCI-Format1-2-r16 SEQUENCE (SIZE (1..8)) OF INTEGER (0..15) OPTIONAL, -- Need M

numberOfBitsForPUCCH-ResourceIndicatorForDCI-Format1-2-r16 INTEGER (0..3) OPTIONAL, -- Need M

dmrs-UplinkTransformPrecodingPUCCH-r16 ENUMERATED {enabled} OPTIONAL, -- Cond PI2-BPSK

spatialRelationInfoToAddModList-r16 PUCCH-SpatialRelationInfoList-r16 OPTIONAL, -- Need N

spatialRelationInfoToReleaseList-r16 PUCCH-SpatialRelationInfoIdList-r16 OPTIONAL, -- Need N

resourceGroupToAddModList-r16 SEQUENCE (SIZE (1..maxNrofPUCCH-ResourceGroups-r16)) OF PUCCH-ResourceGroup-r16

OPTIONAL, -- Need N

resourceGroupToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofPUCCH-ResourceGroups-r16)) OF PUCCH-ResourceGroupId-r16

OPTIONAL -- Need N

]]

}

PUCCH-SpatialRelationInfoList-r16 ::= SEQUENCE (SIZE (1..maxNrofSpatialRelationInfos-r16)) OF PUCCH-SpatialRelationInfo-r16

PUCCH-SpatialRelationInfoIdList-r16 ::= SEQUENCE (SIZE (1..maxNrofSpatialRelationInfos-r16)) OF PUCCH-SpatialRelationInfoId-r16

PUCCH-ResourceGroup-r16 ::= SEQUENCE {

pucch-ResourceGroupId-r16 PUCCH-ResourceGroupId-r16,

resourcePerGroupList-r16 SEQUENCE (SIZE (1..maxNrofPUCCH-ResourcesPerGroup-r16)) OF PUCCH-ResourceId

}

PUCCH-ResourceGroupId-r16 ::= INTEGER (0..maxNrofPUCCH-ResourceGroups-1-r16)

-- TAG-PUCCH-CONFIG-STOP

-- ASN1STOP

maxNrofSpatialRelationInfos INTEGER ::= 8

maxNrofSpatialRelationInfos-r16 INTEGER ::= 64

PUCCH-SpatialRelationInfoId ::= INTEGER (1..maxNrofSpatialRelationInfos)

PUCCH-SpatialRelationInfoId-r16 ::= INTEGER (1..maxNrofSpatialRelationInfos-r16)

The Rapporteur’s understanding is that

1. PUCCH-SpatialRelationInfo-r16 is a true critical extension of PUCCH-SpatialRelationInfo.
2. Network configures either spatialRelationInfoToAddModList (without suffix) or spatialRelationInfoToAddModList-16, there is never a mix.
3. Since max number of PUCCH spatial relations is different, there is both PUCCH-SpatialRelationInfoId (without suffix) and PUCCH-SpatialRelationInfoId -16, as well as both spatialRelationInfoToReleaseList (without suffix).
4. The “intermediate IEs” PUCCH-SpatialRelationInfoList-r16 and PUCCH-SpatialRelationInfoIdList-r16 are not needed, and can be deleted (to maintain consistency with the Rel-15 fields).
5. E130 above can be closed with no change to the specification text.
6. Since the term “the network configures the field…” means that the network included the field in this or a previous message, the intended behaviour could be captured by adding the following to the field description:

|  |
| --- |
| ***spatialRelationInfoToAddModList***  Configuration of the spatial relation between a reference RS and PUCCH. Reference RS can be SSB/CSI-RS/SRS. If the list has more than one element, MAC-CE selects a single element (see TS 38.321 [3], clause 5.18.8 and TS 38.213 [13], clause 9.2.2). The network configures either *spatialRelationInfoToAddModList* (without suffix) or *spatialRelationInfoToAddModList-r16*. |

**I649: Please provide your comments on the discussion and Text Proposal.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | To be further discussed | Similiarly as the above, we think it perhaps worth a discussion on whether we should have some generic principle on this issue.  The meaning of the proposed text is not clear because a ToAddModList is a one shot field. We suggest to say:  "That network can only configure instances of PUCCH-SpatialRelationInfo-r16 if all instances of PUCCH-SpatialRelation (without suffix) in the UE configuration are released (possibly in the same message), and vice-versa."  Besides, it may be good to clarify that "spatialRelationInfoToAddModList (without suffix) can only be used to release spatial relation info created using spatialReleationInfoToAddModList (without suffix).  spatialRelationInfoToAddModList-r16 can only be used to release spatial relation info created using spatialReleationInfoToAddModList-r16." |
| Qualcomm Incorporated | Yes |  |
| MediaTek | To be further discussed | We have similar as Huawei |
|  |  |  |

## Q007, Q008

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q007 | Qualcomm (Masato) | TEI | 2 | None | "If not configured" can mean either RACH-ConfigCommonTwoStepRA is not included or ra-PrioritizationForAI is absent in RACH-ConfigCommonTwoStepRA. The first approach does not allow RACH prioritization to be configured only for 4-step RACH. | We should discuss if such signalling optimization is needed. If deemed necessary, make the following change, and put a suitable need code. If not configured the field is absent in RACH-ConfigCommonTwoStepRA, the UE shall use the values in the corresponding 4-step configuration if configured. |
| Q008 | Qualcomm (Masato) | TEI | 2 | None | "If not configured" can mean either RACH-ConfigCommonTwoStepRA is not included or ra-Prioritization is absent in RACH-ConfigCommonTwoStepRA. The first approach does not allow RACH prioritization to be configured only for 4-step RACH. | We should discuss if such signalling optimization is needed. If deemed necessary, make the following change, and put a suitable need code. If not configured the field is absent in RACH-ConfigCommonTwoStepRA, the UE shall use the values in the corresponding 4-step configuration if configured. |

ra-PrioritizationForAccessIdentityTwoStep-r16 SEQUENCE {

ra-Prioritization-r16 RA-Prioritization OPTIONAL, -- Need S

ra-PrioritizationForAI-r16 BIT STRING (SIZE (2)) OPTIONAL -- Need S

} OPTIONAL, -- Need R

|  |
| --- |
| *RACH-ConfigCommonTwoStepRA* field descriptions |
| ***groupB-ConfiguredTwoStepRA***  Preamble grouping for 2-step random access type. If the field is absent then there is only one preamble group configured and only one msgA PUSCH configuration. |
| ***msgA-CB-PreamblesPerSSB-PerSharedRO***  Number of contention-based preambles used for 2-step RA type from the non-CBRA 4-step type preambles associated with each SSB for RO shared with 4-step type RA. The number of preambles for 2-step RA type shall not exceed the number of preambles per SSB minus the number of contention-based preambles per SSB for 4-step type RA. The possible value range for this parameter needs to be aligned with value range for the configured SSBs per RACH occasion in *SSB-perRACH-OccasionAndCB-PreamblesPerSSB* in *RACH-ConfigCommon*. The field is only applicable for the case of shared ROs with 4-step type random access. |
| ***msgA-PRACH-RootSequenceIndex***  PRACH root sequence index. If the field is not configured, the UE applies the value in field *prach-RootSequenceIndex* in *RACH-ConfigCommon* in the configured BWP. |
| ***msgA-RestrictedSetConfig***  Configuration of an unrestricted set or one of two types of restricted sets for 2-step random access type preamble. If the field is not configured, the UE applies the value in field *restrictedSetConfig* in *RACH-ConfigCommon* in the configured BWP. |
| ***msgA-RSRP-Threshold***  The UE selects 2-step random access type to perform random access based on this threshold (see TS 38.321 [3], clause 5.1.1). This field is only present if both 2-step and 4-step RA type are configured for the BWP. |
| ***msgA-RSRP-ThresholdSSB***  UE may select the SS block and corresponding PRACH resource for path-loss estimation and (re)transmission based on SS blocks that satisfy the threshold (see TS 38.213 [13]). |
| ***msgA-RSRP-ThresholdSSB-SUL***  The UE selects SUL carrier to perform random access based on this threshold (see TS 38.321 [3], clause 5.1.1). The value applies to all the BWPs where 2-step RA is configured. |
| ***msgA-RSRP-ThresholdSUL***  The UE selects 2-step random access type to perform random access if SUL carrier is selected based on this threshold (see TS 38.321 [3], clause 5.1.1). This field is only present if both 2-step and 4-step RA type are configured for the BWP. |
| ***msgA-SSB-PerRACH-OccasionAndCB-PreamblesPerSSB***  The meaning of this field is twofold: the CHOICE conveys the information about the number of SSBs per RACH occasion. Value *oneEight* corresponds to one SSB associated with 8 RACH occasions, value *oneFourth* corresponds to one SSB associated with 4 RACH occasions, and so on. The ENUMERATED part indicates the number of Contention Based preambles per SSB. Value *n4* corresponds to 4 Contention Based preambles per SSB, value *n8* corresponds to 8 Contention Based preambles per SSB, and so on. The total number of CB preambles in a RACH occasion is given by *CB-preambles-per-SSB* \* max(1, *SSB-per-rach-occasion*). If the field is not configured and both 2-step and 4-step are configured for the BWP, the UE applies the value in the field *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* in *RACH-ConfigCommon*. |
| ***msgA-SSB-SharedRO-MaskIndex***  Indicates the subset of 4-step type ROs shared with 2-step random access type for each SSB. This field is configured when there is more than one RO per SSB. If the field is absent, and 4-step and 2-step has shared ROs, then all ROs are shared. |
| ***msgA-SubcarrierSpacing***  Subcarrier spacing of PRACH (see TS 38.211 [16], clause 5.3.2). Only the values 15 or 30 kHz (FR1), and 60 or 120 kHz (FR2) are applicable. The field is only present in case of 2-step only BWP, otherwise the UE applies the SCS as derived from the *msgA-PRACH-ConfigurationIndex* in *RACH-ConfigGenericTwoStepRA* in the configured BWP (see tables Table 6.3.3.1-1 and Table 6.3.3.2-2, TS 38.211 [16]). The value also applies to contention free 2-step random access type (*RACH-ConfigDedicated*). |
| ***msgA-TotalNumberOfRA-Preambles***  Indicates the total number of preambles used for contention-based and contention-free 2-step random access type when ROs for 2-step are not shared with 4-step. If the field is absent, and 2-step and 4-step does not have shared ROs, all 64 preambles are available for 2-step random access type. |
| ***ra-PrioritizationForAI***  Indicates whether the field ra-Prioritization-r16 applies for Access Identities. The first/leftmost bit corresponds to Access Identity 1, the next bit corresponds to Access Identity 2. Value 1 indicates that the field ra-Prioritization-r16 applies, otherwise the field does not apply. If the field is absent, the UE shall use the values in the corresponding 4-step configuration if configured. |
| ***ra-ContentionResolutionTimer***  The initial value for the contention resolution timer for fallback RAR in case no 4-step random access type is configured (see TS 38.321 [3], clause 5.1.5). Value *sf8* corresponds to 8 subframes, value *sf16* corresponds to 16 subframes, and so on. |
| ***ra-Prioritization***  Parameters which apply for prioritized random access procedure for specific Access Identities. If the field is absent, the UE shall use the values in the corresponding 4-step configuration if configured. |
| ***rach-ConfigGenericTwoStepRA***  2-step random access type parameters for both regular random access and beam failure recovery. |

These RILs are leated to 2Step-RA  
The Rapporteur provided text proposal according to RILs (modified need code and modified field descriptions).

Q007, Q008: RAN2 is asked to discuss:

1. If this signalling optimization is needed (alternative would be to have fields ra-Prioritization-r16 and ra-PrioritizationForAI-16 mandatory within ra-PrioritizationForAccessIdentityTwoStep-r16).
2. If signaling optimization is needed, is text proposal agreeable?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Reason** |
| Huawei, HiSilicon | No | We think the description is linked to the corresponding field and therefore there seems no confusion. |
| Qualcomm Incorporated | Yes | 1. OK to have such optimization. 2. Yes, agreeable.   Sorry I do not understand Huawei’s comment above. |
| MedaiTek | See comment | Prefer NOT to have signalling optimiation and suggest to make 2 field mandatory. This is just simpler and avoid confusion.  If companies really want to reuse the configuration from 4-step RACH, it is suggested to make the field (*ra-PrioritizationForAccessIdentityTwoStep-r16*) to “Need S” and could be reuse the whole configuration from 4-step RACH. The 2 sub field could still be mandatory. But we think this is also not really necessary and prefer to use simple solution. |
|  |  |  |

# Conclusion

The followings are proposed:

To be agreed:

Further discussion:

# References