3GPP TSG-RAN WG2 #114-e R2-210xxxx

eMeeting, 19th – 27th May, 2021

Agenda Item: 6.1.4.1.5

Source: MediaTek Inc.

**Title: Report of e-mail discussion [AT114-e][022][NR16] RRC II (MediaTek)**

Document for: Discussion and decision

# 1 Introduction

This is report for the following AT114-e mail discussion.

* [AT114-e][022][NR16] RRC II (MediaTek)

Scope: Treat R2-2105069, R2-2105423, R2-2105425, R2-2105427, R2-2106338, R2-2106339, R2-2106340, R2-2106382, R2-2106383, R2-2104987, R2-2104717, R2-2105713, R2-2105714, R2-2104985, R2-2104986, R2-2105712, R2-2106115, R2-2106116, R2-2106117, R2-2106118, R2-2105645, R2-2105358, R2-2106464

Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

Intended outcome: Report and Agreed CRs.

Deadline: Schedule A

Phase 1 deadline - **Friday May 21 1000 UTC**

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

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| --- | --- | --- |
| Company | Name | Email Address |
| MediaTek (Rapp) | Felix Tsai | chun-fan.tsai@mediatek.com |
| Ericsson | Oscar Ohlsson | oscar.ohlsson@ericsson.com |
| Qualcomm Incorporated | Masato Kitazoe | mkitazoe@qti.qualcomm.com |
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# 3 Discussion (Phase 1)

## 3.1 TEI16 - MPS Redirection

In this section, we discuss the MPS redirection issue with the intention to endorse some CRs. The following CRs from Perspecta Labs (and other companies) are almost endorsable in last meeting.

**CR set I**

[R2-2105069](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2105069.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile US, Ericsson, Qualcomm, NTT DoCoMo, AT&T, Verizon CR Rel-16 36.331 16.4.0 4579 4 C NR\_newRAT-Core, TEI16 R2-2103042

[R2-2105423](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2105423.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile US, Ericsson, Qualcomm, NTT DoCoMo, AT&T, Verizon CR Rel-16 38.331 16.4.1 2413 4 C NR\_newRAT-Core, TEI16 R2-2104635

[R2-2105425](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2105425.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile US, Ericsson, Qualcomm, NTT DoCoMo, AT&T, Verizon CR Rel-16 36.306 16.4.0 1804 3 C NR\_newRAT-Core, TEI16 R2-2104636

[R2-2105427](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2105427.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile US, Ericsson, Qualcomm, NTT DoCoMo, AT&T, Verizon CR Rel-16 38.306 16.4.0 0526 3 C NR\_newRAT-Core, TEI16 R2-2104637

However, there is another set of CR from ZTE that propose slightly different way (a more generic way) to perform this kind of prioritization after redirection.

**CR set II**

[R2-2106339](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106339.zip) Redirection with high priority access-38.331 ZTE corporation, Sanechips CR Rel-16 38.331 16.4.1 2691 - C NR\_newRAT-Core, TEI16

[R2-2106340](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106340.zip) Redirection with high priority access-38.306 ZTE corporation, Sanechips CR Rel-16 38.306 16.4.0 0603 - C NR\_newRAT-Core, TEI16

[R2-2106382](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106382.zip) Redirection with high priority access-36.331 ZTE corporation, Sanechips CR Rel-16 36.331 16.4.0 4685 - C NR\_newRAT-Core, TEI16

[R2-2106383](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106383.zip) Redirection with high priority access-36.306 ZTE corporation, Sanechips CR Rel-16 36.306 16.4.0 1818 - C NR\_newRAT-Core, TEI16

The rapporteur suggest to discuss the some high level principle (mentioned in discussion paper [R2-2106338](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106338.zip)) before going to CR details.

[R2-2106338](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106338.zip) Redirection with high priority access ZTE corporation, Sanechips discussion Rel-16 NR\_newRAT-Core, TEI16

The first question is whether we should use unified solution for high priority redirection.

**Question 1.1: Which approach does company prefer?**

* **Option 1 – Specific enhancement for MPS redirection (CR set I)**
* **Option 2 – A unified mechanism to support redirection with high priority access (CR set II)**

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| **Company** | **Prefer Option** | **Comments** |
| Ericsson | 1 | A generalized approach would have been good but the high services differs slightly which makes it hard to design a general solution that fits all of them. For example, setting the correct establishment cause will be difficult unless the specific service is indicated in the release with redirect. There might also be some differences in how to handle access control. It’s also a bit late now to introduce a general solution since we already introduced a service specific solution for LTE voice fallback. |
| Qualcomm Incorporated | Option 1 (Proponent) | Differences I see in the set II as compared to the set I are:   1. High priority indication only affects ACB, but not the establishment cause. 2. With high priority indication, the UE does not even check ACB for Access Identity 1 (MPS), i.e. it allows full access right regardless of ACB.   The second one especially is a major departure from the existing ACB framework and hence should be avoided. |
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Another difference between CR set I and set II is on handling of connection establishment cause. In CR set I, the establishment cause is replaced by “*mps-PriorityAccess*” or “*highPriorityAccess*” in case of MPS redirection. In CR set II, the establishment cause is not changeddue to high priority redirection and it may use the establishment cause set by NAS later. One reason from R2-2106338 for not replacing the establishment cause is to avoid CT1 impact. It is actually unclear to the rapporteur that what would be the establishment cause from NAS in this kind of redirection.

**Question 1.2: For the connection establishment cause using in this procedure, which option does company prefer?**

* **Option 1 – Replace the establishment cause (CR set I)**
* **Option 2 – No change on establishment cause (CR set II)**

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| **Company** | **Prefer Option** | **Comments** |
| Ericsson | 1 | The establishment cause should be replaced to ensure that the connection establishment is prioritized by the network.  In our understanding, the UE will only establish a new connection in the new cell after the release with redirect if the new cell belongs to a tracking area that lies outside the UE’s current registration area. AS would report the new tracking area to NAS which would trigger a tracking area update which in turn would cause AS to establish a new RRC connection. The establishment cause will therefore be set to mo-Signalling unless we override it.  If the new cell belongs to a tracking area within the registration area there won’t be any trigger from NAS to establish a new connection and the UE would just be camping in idle/inactive mode in the new cell. |
| Qualcomm Incorporated | Option 1 |  |
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Finally companies are invite to provide other detail comment on the CRs or another aspect need to be discussed in this topic.

**Question 1.3: Do companies have further comments regarding to this issue and/or detail wording comments on the CR set I or CR set II?**

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| **Company** | **Comments** |
| Ericsson | In ZTE’s general solution (CR set II) the access barring check is always skipped which may not be desirable. In Perspecta’s MPS specific solution (CR set I) the access barring check is only skipped if the bit corresponding to the MPS access identity is set to 0, i.e. it is possible for the network to control whether access barring is skipped or not. |
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## 3.2 HARQ configuration (R2 TEI)

In this section, we discuss HARQ configuration issue raised by the following paper.

[R2-2104987](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104987.zip) Restrictions in the number of HARQ processes Nokia, Nokia Shanghai Bell discussion Rel-16 NR\_newRAT-Core, TEI16

Basically, it is proposed to extend the configuration granularity on the number of HARQ process as the sample ASN.1 code below.

PDSCH-ServingCellConfig ::= SEQUENCE {

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

...,

[[

nrofHARQ-ProcessesForPDSCH-v16xy INTEGER (1..16) OPTIONAL -- Need R

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}

The observations and proposals from [R2-2104987](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104987.zip) is copied below for reference. Companies are invited to provide comment on the proposals.

*Observation 1: It is mandatory for all NR UEs to support up to 16 HARQ processes for both uplink and downlink.*

*Observation 2: Current RRC doesn't allow full granularity for configuring amount of used PDSCH HARQ processes due to RAN1 decision in 2018.*

*Observation 3: CG and SPS allow more granular configuration of HARQ processes than PDSCH.*

*Observation 4: The limitations in number of configured HARQ processes can impact the peak UE throughput.*

*Proposal 1: Allow more granular configuration of PDSCH HARQ processes for UE.*

*Proposal 2: Adopt the more granular configuration of PDSCH HARQ processes for UE from Rel-16 onwards.*

*Proposal 3: RAN2 to adopt the CR according to Annex A changes (which has no impact to RAN1 specifications).*

**Question 2.1: Do companies agree the intention of the CR in** [**R2-2104987**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104987.zip) **? Any comment to the observations / proposals, or detail CR wording suggestion?**

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| **Company** | **Agree the intention or not** | **Comments** |
| Qualcomm Incorporated | No | It looks like an optimization and should be avoided in release-16. |
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## 3.3 Half-duplex operation (R1 TEI-16)

In this section, we discuss the R2 SPEC impact from the R1 reply LS below.

[R2-2104717](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104717.zip) Reply LS on half-duplex operation (R1-2104122; contact: Huawei) RAN1 LS in Rel-16 TEI16 To:RAN2

The LS content is copied below

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RAN1 has discussed the LS and has the following understanding/agreements:

* RAN1 agrees to use the per-serving-cell configuration of *directionalCollisionHandling* as currently implemented by RRC, and the collision handling operation is applied to the set of cell(s) configured/enabled by *directionalCollisionHandling* within the cell group.
* RAN1 also agrees that the UE does not expect any directional collision among the serving cells that the UE is not capable of simultaneous transmission and reception after the UE applies the directional collision handling within the set of cell(s).
* In addition, RAN1 agrees that

Rel-16 collision handling is applicable to TDD intra-band CA

* + UE can report *half-DuplexTDD-CA-SameSCS-r16* for a band combination that is intra-band only.
  + UE can report *half-DuplexTDD-CA-SameSCS-r16* in case of mix of intra- and inter-band CA if *simultaneousRxTxInterBandCA* is not included.

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The rapporteur understand that RAN2 has to update field description of the configuration and capability parameters according to the latest RAN1 agreements in the LS. There is two set of CR proposed below, the intention seems aligned at high level.

**CR Set A**

[R2-2105713](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105713.zip) CR on half-duplex operation Huawei, HiSilicon, CATT CR Rel-16 38.306 16.4.0 0590 - F TEI16

[R2-2105714](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105714.zip) CR on half-duplex operation Huawei, HiSilicon, CATT CR Rel-16 38.331 16.4.1 2642 - F TEI16

**CR Set B**

[R2-2104985](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104985.zip) Corrections to directional collision handling in half-duplex operation Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.4.0 0575 - F TEI16

[R2-2104986](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104986.zip) Corrections to directional collision handling in half-duplex operation Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.4.1 2596 - F TEI16

Rapporteur would like to check whether companies agree the intention of the CRs and which set of CR is preferable as baseline.

**Question 3.1: Which set of CR is preferred and any further comment on CR wording or coversheet?**

* **Option 1 – Take CR Set A (**[**R2-2105713**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105713.zip) **and** [**R2-2105714**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105714.zip)**) as baseline**
* **Option 2 – Take CR Set B (**[**R2-2104985**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104985.zip) **and** [**R2-2104986**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2104986.zip)**) as baseline**
* **Option 3 – No CR is needed (please explain why)**

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| **Company** | **Preferred option** | **Comments** |
| Qualcomm Incorporated | Option 2 | Text is cleaner |
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In addition, there is proposal to send reply LS to RAN1. However, maybe agree on R2 CRs is sufficient. Companies are invited to provide their view on this.

**LS out**

[R2-2105712](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105712.zip) Draft Reply LS on half-duplex operation Huawei, HiSilicon LS out Rel-16 TEI16 To:RAN1

**Question 3.2: Do companies agree to send reply LS to RAN1 and if yes, any comment/suggestion on the content of reply LS?**

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| **Company** | **Agree to send LS** | **Comments** |
| Qualcomm Incorporated | No | Not very essential. |
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## 3.4 List without ToAddMod (R2 ASN.1)

In this section, we discuss the handling on Extension of *candidateBeamRSList* based on the following papers.

[R2-2106115](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106115.zip) Extension of candidateBeamRSList set to "release" MediaTek Inc., Intel Corporation discussion Rel-16

Basically, the issue comes from non-critical extension of a list without ToAddMod as the following ASN.1 code. (Simplified version of the real ASN.1 code)

BeamFailureRecoveryConfig ::= SEQUENCE {

candidateBeamRSList SEQUENCE (SIZE(1..16)) OF PRACH-ResourceDedicatedBFR OPTIONAL, -- Need M

candidateBeamRSListExt-v1610 SetupRelease{ CandidateBeamRSListExt-r16 } OPTIONAL -- Need M

}

CandidateBeamRSListExt-r16::= SEQUENCE (SIZE(1..48)) OF PRACH-ResourceDedicatedBFR

There is ambiguity when *candidateBeamRSListExt-v1610* is set to release, does this imply that the whole list is released or just the extended elements are released.

Note that in 38.331 6.1.3, we have the following general rules on this kind of list.

Upon reception of a list not using ToAddModList and ToReleaseList structure, the UE shall delete all entries of the list currently in the UE configuration before applying the received list and shall consider each entry as newly created. This applies also to lists whose size is extended (i.e. with a second list structure in the ASN.1 comprising additional entries). This implies that Need M should not be used for fields in the entries of these lists; if used, UE will handle such fields equivalent to a Need R.

We see 3 different solutions and would like to check companies view on this.

**Question 4.1: Which of the three options above should be adopted. (when *candidateBeamRSListExt-v1610* is set to release)**

* **Option 1: The UE releases the entire concatenated list, both the entries configured with *candidateBeamRSList* and the entries configured with *candidateBeamRSListExt-v1610***
* **Option 2: The UE releases only the extended entries that were configured with *candidateBeamRSListExt-v1610*.**
* **Option 3: The *release* branch is not used, and the UE treats *candidateBeamRSList* and *candidateBeamRSListExt-v1610* as a single concatenated field with Need M. The extended list *candidateBeamRSListExt-v1610* is only included when *candidateBeamRSList* is included and fully populated**

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| **Company** | **Preferred option** | **Comments** |
| Qualcomm Incorporated | Option 2 | We prefer a simple solution in general.  Option 1 requires UE logic to release the entire list first and then configure new entries as configured in the same IE.  Option 3 is even bigger change. |
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There are CRs provided for different options. Companies are invited to comment on the following of CRs. (Based on your preferred option). The proponents have attempted to capture inter-operability impacts in the coversheets, but any comments in this direction are invited. All three options are ASN.1 BC.

[R2-2106116](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106116.zip) Handling of candidateBeamRSListExt-v1610 set to “release” (option 1) MediaTek Inc., Intel Corporation draftCR Rel-16 38.331 16.4.1 F NR\_eMIMO-Core

[R2-2106117](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106117.zip) Handling of candidateBeamRSListExt-v1610 set to “release” (option 2) MediaTek Inc., Intel Corporation draftCR Rel-16 38.331 16.4.1 F NR\_eMIMO-Core

[R2-2106118](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2105_R2_114-e/Docs/R2-2106118.zip) Handling of candidateBeamRSListExt-v1610 set to “release” (option 3) MediaTek Inc., Intel Corporation draftCR Rel-16 38.331 16.4.1 F NR\_eMIMO-Core

**Question 4.2: Any comments on above CR contents?**

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## 3.5 IAB Misc.

Companies are invited to provide comments on the following IAB correction CRs.

[R2-2105645](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105645.zip) Resolving ambiguity in use of BAP routing ID Samsung Electronics GmbH CR Rel-16 38.331 16.4.1 2637 - F NR\_IAB-Core

**Question 5.1: Do companies agree the intention of the CR in** [**R2-2105645**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105645.zip) **? Any further comment or suggestion on CR wording or coversheet?**

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| **Company** | **Agree the intention or not** | **Comments** |
| Qualcomm Incorporated | Yes |  |
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[R2-2105358](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105358.zip) Miscellaneous corrections on IAB vivo CR Rel-16 38.331 16.4.1 2619 - F NR\_IAB-Core

**Question 5.2: Do companies agree the intention of the CR in** [**R2-2105358**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2105358.zip) **? Any further comment or suggestion on CR wording or coversheet?**

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| **Company** | **Agree the intention or not** | **Comments** |
| Qualcomm Incorporated | Yes |  |
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## 3.6 Failure type for NR SCG (LTE)

In this section, we discuss the NR SCG failure type reporting in LTE based on the following paper.

[R2-2106464](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2106464.zip) Discussion on compatibility issue on failure type for NR SCG failure CATT discussion

It is pointed out that the use of R16 code point in UL enumerated-type may cause network error as observation 1 below.

*Observation 1 For a Rel-15 eNB, receiving an SCGFailureInformationNR message with a Rel-16 failure type will cause a “transfer syntax error” and discarding of the entire message, which further blocks the network from benefit from other field, e.g. to select a new SgNB based on the measResultFreqListNR-15 field.*

failureType-r15 ENUMERATED {

t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx,

synchReconfigFailureSCG, scg-reconfigFailure,

srb3-IntegrityFailure, other-r16},

measResultFreqListNR-r15 MeasResultFreqListFailNR-r15 OPTIONAL,

//////////////////////////////////skip irrelevant codes//////////////////////////////////

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failureType-v1610 ENUMERATED {t312-Expiry, scg-lbtFailure,

beamFailureRecoveryFailure, bh-RLF-r16, spare4,

spare3, spare2, spare1} OPTIONAL

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**Question 6.1: Do companies agree the observation 1 in** [**R2-2106464**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2106464.zip) **that R16 code point in *failureType-r15* may cause syntax error in R15 gNB? If yes, any suggested solution?**

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| **Company** | **Agree or not** | **Comments** |
| Qualcomm Incorporated | Maybe | Most of the new release-16 failure causes are used only when the network is aware that related feature is used, e.g. NR-U, IAB. In those cases, we expect the network should support the “other-r16” and the corresponding new failure cause in failureType-v1610. Only exception seems "beamFailureRecoveryFailure".  We are ready to hear to network vendors’ input, but would like to avoid NBC for the UE. |
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Furthermore, it is suggested to have some general principle for the enumerated-type ASN.1.

*Proposal 2 RAN2 to specify a principle on introducing an enumerated-type ASN.1 field with the number of logically-valid code points not identical to 2ⁿ, especially for the case that the field is mandatory present.*

**Question 6.2: Do companies agree to have some general principle for enumerated-type ASN.1 field. If yes, what would be the general principle? Is the principle in Proposal 2 of** [**R2-2106464**](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_114-e\Docs\R2-2106464.zip) **agreeable?**

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| **Company** | **Comments** |
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# 4 Discussion (Phase 2)

# 5 Conclusions

Base on the discussion in section 3 and 4, we propose the following:

Phase 1

Phase 2

# 6 References