3GPP TSG-RAN WG2 #115e Tdoc R2-21xxxxx

Electronic meeting, 2021-08-09 – 2021-08-27

Agenda Item: x.x.x.x

Source: Ericsson (Rapporteur)

Title: E-mail discussion summary of [Post114-e][070][NR15] Common Fields in Dedicated Signalling

Document for: Discussion, Decision

# 1 Discussion

* [Post114-e][070][NR15] Common Fields in Dedicated Signalling (Ericsson)

Scope: Continue discussion Spawned from [R2-2106451](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2106451.zip), [R2-2104919](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2104919.zip), [R2-2105933](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2105933.zip). If possible/helpful find a principle that can work, e.g. for R16 (can treat R15 and R16 differently). If found useful, discuss and find issues solutions or exception case by case.

Intended outcome: Report.

Deadline: Long (2021-08-06 0900 UTC)

Companies are invited to fill in contact details.

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| **Company** | **Contact details** |
| Ericsson | Mats Folke (mats.folke@ericsson.com) |
| Samsung | Jaehyuk Jang (jack.jang@samsung.com) |
| Qualcomm Incorporated | Masato Kitazoe (mkitazoe@qti.qualcomm.com) |
| MediaTek | Felix Tsai (chun-fan.tsai@mediatek.com) |
| Intel | Sudeep.k.palat@intel.com |
| OPPO | qianxi.lu@oppo.com |

The topic of common fields in dedicated signalling was discussed during RAN2#114 and captured as follows:

**Common fields in dedicated signalling**

Treat online

[R2-2105933](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2105933.zip) Configuration of common fields in dedicated signalling Ericsson discussion Rel-15 NR\_newRAT-Core

DISCUSSION

- Ericsson explains that the tdoc has now been updated with more examples, 2.1.2 BWP UL Common contains RACH config common, contains some parameters that are dependent on UE cap which is not signaled. Also the field PRACH root seq index has no capability.

[R2-2104919](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2104919.zip) Handling of common configuration Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core

DISCUSSION

- Ericsson wonder for the HO scenario this would apply, and for this case SI is assued included.

- QC think this may apply in any case.

- Intel think that for delta signalling common we need Need R. Has there been issues. QC think that for servingcellconfigcommonSIB this may be the case but not for servingcellconfigcommon.

- Huawei think that delta signalling for servingcellconfigcommon is not assumed as the configuration is soon overridden by servingcellconfigcommonSIB. QC think that there is a time when servingcellconfigcommon is appled. MTK are not sure it is good to replace dedicated info with SIB info. MTK think that in dedicated info UE caps shall be taken into account.

[R2-2105174](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2105174.zip) Discussion on the Common Configuration in the Dedicated Signaling ZTE Corporation, Sanechips discussion Rel-15

=> Revised in [R2-2106451](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2106451.zip)

[R2-2106451](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2106451.zip) Discussion on the Common Configuration in the Dedicated Signaling ZTE Corporation, Sanechips discussion Rel-15

DISCUSSION

- QC think we have already agreements that are opposite to P2. Network must obey the UE cap.

- Huawei think we should discuss case by case. Ericsson paper is about R16. Is there any issue for R15?

- QC think we need a principle rather than case-by-case assessment. LG agrees think we neded to set general principle first. Ericsson also prefer to set a principle.

- ZTE think we should only discuss R15 if there is a specific issue and wonder whether there should be a compliance check for R16,

- Intel think that if companies want to anayse case by case. Email discussion is very helpful

* Long email discussion

The three input documents have the following proposals:

[R2-2105933](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2105933.zip) Configuration of common fields in dedicated signalling Ericsson

**Observation 1 It is not clear if common configuration included in dedicated signaling should contain all the relevant parameters signaled in SI or whether it should be tailored according to the UE capabilities.**

**Proposal 1 RAN2 to confirm that any extensions included in the initial BWP configuration included in ServingCellConfigCommon should match MIB and SIB1 (implying that a UE should successfully decode the initial BWP configuration included in ServingCellConfigCommon).**

**Proposal 2 RAN2 to discuss whether extensions to the common IEs included in the dedicated BWP configuration in ServingCellConfig should be provided according to the UE capabilities or not.**

**Proposal 3 If RAN2 concludes the network adapts extensions to the common IEs included in the dedicated BWP configuration in ServingCellConfig according to the UE capabilities, then discuss what to do with common IEs currently lacking UE capabilities.**

[R2-2104919](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2104919.zip) Handling of common configuration Qualcomm Incorporated

**Observation 1: According to TS38.331, the UE does not distinguish between dedicated configuration and common configuration in checking if the UE is able to comply with the configuration included in the RRCReconfiguration message.**

**Observation 2: No compliance check is defined for the system information. The UE is required to disregard configurations it does not support.**

**Observation 3: Handling of delta configuration for common configuration becomes ambiguous if the UE “disregards” some parameters in common configuration of dedicated signalling.**

**Proposal 1: The network shall ensure that the common configuration in dedicated signalling not only is compliant to UE capability, but also is aligned with dedicated configuration.**

[R2-2106451](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2106451.zip) Discussion on the Common Configuration in the Dedicated Signaling ZTE Corporation, Sanechips

**Observation 1: For the BWP Common configuration for the non-initial BWP, the same signalling structure as the initial BWP in the system information was adopted.**

**Proposal 1: There is no need to take the UE capability into consideration for the BWP Common Configuration in the dedicated signalling.**

**Observation 2: For the ServingCellConfigCommon, except the lte-CRS-ToMatchAround /rateMatchPatternToAddModList, all of other elements are also included in the system Information.**

**Observation 3: The main usage of lte-CRS-ToMatchAround /rateMatchPatternToAddModList is LTE/NR co-existence.**

**Proposal 2: For the lte-CRS-ToMatchAround/rateMatchPatternToAddModList configuration in the ServingCellConfigCommon, no need to match the UE capability (i.e. rateMatchingLTE-CRS /rateMatchingResrcSetSemi-Static).**

**Proposal 3: Common configuration in dedicated signalling and in broadcast information should be consistent unless explicitly specified otherwise (e.g.controlResourceSetZero   and searchSpaceZero  in the downlinkConfigCommon,  which can be  configured in ServingCellConfigCommon  even if MIB indicates that they are absent.)**

Based on the input papers the rapporteur thinks there are four issues to address.

1. Consistency of common configuration – This is about keeping a consistency between SIB1 as transmitted in broadcast and as configured with dedicated signalling at reconfiguration with sync.
2. Conformance with UE capabilities – This is about making sure the configuration can be successfully decoded by the UE according to its capabilities.
3. Contents of RRCReconfiguration – This is about which fields to include in RRCReconfiguration and comes as a consequence of the two prior issues.
4. Fields without UE capabilities – This is about how to handle fields which lack a corresponding UE capability.

## 1.1 Issue 1 – Consistency

Two of the papers directly address the issue of how to set common fields included in both SIB and dedicated message. There seems to be a common understanding to stick to the principle used at reconfiguration with sync. This is the underlying principle of providing parameters in System Information for the target cell prior to handover.

The rapporteur proposes:

1. Consistency of common information: Stick to the principle that ServingCellConfigCommon contains the same information as SIB1, i.e., fields that are present in ServingCellConfigCommon shall have the same value as the corresponding field in SIB1.

The rapporteur invites companies to comment on the proposal.

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| **Company** | **Comment** |
| Ericsson | We think this is an important principle which was established in Rel-15. |
| Samsung | Agree. |
| Qualcomm Incorporated | Agree. |
| MediaTek | Agree the priciple of consistent.  Note that some paramters only exist in *ServingCellConfigCommonSIB* of SIB1 (e.g. PCCH and BCCH configuration), the UE sitll has to read SIB1 after handover. |
| Huawei, HiSilicon | Agree. Also agree with MTK that some information in *ServingCellConfigCommonSIB* are not in *ServingCellConfigCommon.* |
| Intel | Agree |
| OPPO | Agree |

## 1.2 Issue 2 – Conformance

In one way or the other, all three papers address the issue on how to make sure the configuration can be successfully decoded by the UE according to its capabilities. There is a long-standing requirement that the RRCReconfiguration message is adopted to the capabilities of the UE and the rapporteur has not seen any interest in changing this. The rapporteur proposes:

1. Conformance with UE capabilities: Agree that the requirement that the RRCReconfiguration message shall be in accordance with the UE capabilities applies also to the xxxCommon fields and IEs therein.

The rapporteur invites companies to comment on the proposal.

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| **Company** | **Comment** |
| Ericsson | We think this is also important. |
| Samsung | See Issue 5 below. |
| Qualcomm Incorporated | Agree. We understand this has been the principle. There is one example this was confirmed by RAN2 as follows.  - RAN2#104: UEs indicating the support via the existing IOT bit (rateMatchingLTE-CRS) will support the reception of the correponding parameters in ServingCellConfig.  - RAN2#105bis: Cell level rate matching parameters, i.e., lte-CRS-ToMatchAround, rateMatchPatternToAddModList, and rateMatchPatternToReleaseList, if different parameters are configured in ServingCellConfigCommon and ServingCellConfig, the UE behaviour is not specified. |
| MediaTek | Agree  BTW, we also wonder is there any IOT issue in the field that trigger this discussion ? If yes, which configuaiton cause the IOT issue between UE and NW ? |
| Huawei, HiSilicon | The ServingCellConfig which is UE specific should be signalled in accordance with UE capabilities.  However, the ServingCellConfigCommon which is cell specific is not necessarily signalled according to UE capabilities. In other words, if the UE doesn’t support the corresponding parameters, the UE can just ignore it. This is in line with *dedicatedSIB1-Delivery* in RRCReconfiguration message, as well as UE capabilities without signalling defined. |
| Intel | While this proposal is acceptable to us, we are not sure why such network requirement is essential.  If the UE and network are of the same release, UE should be able to decode the ASN.1. Even if the network is of a later release than the UE, the non-critical extension mechanism will allow UE to decode the ASN.1 according to the UE’s release.  UE ignores the fields that it doesn’t support for xxxCommon fields. This is the same UE behaviour when receiving the SIBs. And the same behaviour as is considered acceptable when SIB is provided over dedicated signalling in 1.5.  The requirement of network having to comply with the UE capability was, in our understanding, meant to handle UE dedicated configuration rather than UE dedicated signalling carrying common fields. |
| OPPO | Agree.  As quoted by QC, when there is collision between common field carried in SIB and in dedicated signaling, the UE behavior is not clearly defined as far, so we have similar doubt as MTK – it would be easier to focus on the concrete issue. |

## 1.3 Issue 3 – Contents

How does the network set the contents of RRCReconfiguration message based on the principles outlined in issue 1 and 2? If a field in e.g. ServingCellConfigCommon is present in SIB1 and the UE does not support it, the only reasonable conclusion is not to include it when transmitted as a dedicated message. That way the principles outlined in issue 1 and 2 are upheld. The rapporteur proposes:

1. Contents of xxxCommon IEs in RRCReconfiguration message: As a consequence of the previous two principles, the NW omits fields in xxxCommon IEs in the RRCReconfiguration message if they are present in SIB1 but not supported by the UE.

The rapporteur invites companies to comment on the proposal.

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| **Company** | **Comment** |
| Ericsson | We think the rapporteur is correct in that if there must be a consistency (i.e. all fields must have same value) and conformance (i.e. the message must adhere to the capabilities of the UE) then this proposal is the logical conclusion. |
| Samsung | Regardless of conclusion, we think the clear guidance should be specified in the specification to avoid any ambiguity in the implementation in both UE and network, although RAN2 might end up with general principle statement only, considering the contents of RRCReconfiguration message... |
| Qualcomm Incorporated | Agree. |
| MediaTek | We would like to clarify the proposal first. There are 4 possible cases.  Case 1 – The feature is disabled in both SIB1 and dedicated message.   * NW does not support (does not enable) this feature * No ambigulity   Case 2 – The feature is enabled in both SIB1 and dedicated message.   * (Case 2.1) For UE supports this feature   + Valid configuration * (Case 2.2) For UE does not support   + This configuration is NOT allowded * This does not follow proposal 1 strictly (but maybe ok)   Case 3 – The feature is enabled in dedicated message but disabled in SIB1   * (Case 3.1) For UE supports this feature   + Valid configuration? We understand UE should follow dedicated signaling so the UE should eanble the feature   + This does not follow proposal 1 strictly * (Case 3.2) For UE does not support   + This configuration is NOT allowded   Case 4 – The feature is enabled in SIB1 but disabled in dedicated message   * (Case 4.1) For UE supports this feature   + Unclear on whether UE should enable or disable the feature   + We believe that UE should follow dedicated message * (Case 4.2) For UE does not support   + The UE should ignore the unsupported feature in SIB1   + This does not follow proposal 1 strictly, but maybe okay   We understand the proposal implies that case 2.1 and 4.2 are used if NW supports this feature. If that is the case, we are okay with this proposal. Note that we think case 3.1 and 4.1 should be avoided.  [Rapp] Thanks for the extensive review. It is correct that if the proposal is agreed then cases 2.1 and 4.2 are used. |
| Huawei, HiSilicon | As we mentioned in Question 1, we would like to leave the UE to ignore the unsupported configuration signalled in the ServingCellConfigCommon which is cell specific. |
| Intel | While this proposal is acceptable, as mentioned in our response to issue 2, we are not sure if such network behaviour is essential. |
| OPPO | Agree, and same view as MTK above for the detailed cases. |

## 1.4 Issue 4 – Lack of capability

One of the papers identified some fields lacking UE capability. This implies the network is unaware of the UE support and thus is unable to omit the fields as proposed in issue 3. The rapporteur thinks this was an unfortunate oversight and believes RAN2 should remember to add capabilities for all fields in the future. The rapporteur proposes:

1. Fields without UE capabilities: Fields for which no UE capability exists do not need to be removed from the xxxCommon fields and IEs in RRCReconfiguration message, i.e., the UE should support the decoding thereof. RAN2 should remember to define UE capabilities for such cases in future.

The rapporteur invites companies to comment on the proposal.

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| **Company** | **Comment** |
| Ericsson | It is unfortunate that some fields lack capability. We need to be more careful in the future. We support the proposal. |
| Samsung | Agree. |
| Qualcomm Incorporated | The network is not aware of the UE capability, then no other choice. We agree that this case should be avoided in the future.  We were wondering though what the features of this category are.  [Rapp] In R2-2105933 the parameter *prach-RootSequenceIndex-r16* was mentioned as a parameter which lacks UE capability. |
| MediaTek | Similar clarificaion as in previous preoposal.  Case 1 – The feature is disabled in both SIB1 and dedicated message.   * NW does not support (does not enable) this feature * No ambigulity   Case 2 – The feature is enabled in both SIB1 and dedicated message.   * (Case 2.1) For UE supports this feature   + Valid configuration * (Case 2.2) For UE does not support   + The UE should ignore the unsupported feature in common configuraiton (No matter it is present in SIB1 or dedicated message). * This does not follow proposal 1 strictly (but maybe ok)   Case 3 – The feature is enabled in dedicated message but disabled in SIB1   * (Case 3.1) For UE supports this feature   + Valid configuration? We understand UE should follow dedicated signaling so the UE should eanble the feature   + This does not follow proposal 1 strictly * (Case 3.2) For UE does not support   + This configuration is NOT allowded   Case 4 – The feature is enabled in SIB1 but disabled in dedicated message   * (Case 4.1) For UE supports this feature   + Unclear on whether UE should enable or disable the feature   + We believe that UE should follow dedicated message * (Case 4.2) For UE does not support   + The UE should ignore the unsupported feature in SIB1   + This does not follow proposal 1 strictly, but maybe okay   We understand the proposal implies that **case 2.1** and **2.2** are used if NW supports this feature. For case 2.2, we wonder if it is possible to have some guideline in the SPEC?  [Rapp] If the proposal is agreed it would be beneficial to add some text related to case 2.2, i.e. the parameters the UE must ignore, even though it does not support them. |
| Huawei, HiSilicon | Agree. The common principle can be:  The UE ignores the unsupported configuration signalled in the ServingCellConfigCommon, whether or not there is a UE capability defined. |
| Intel | UE has to be able to receive common fields and decode them for at least these features pre-Rel-17. In our understanding, this was not an oversight - that capability was not introduced for these features which do not need UE dedicated configuration or where the network does not need to know the UE capability for functional reasons.  Would this approach mean that we have to start adding capability for features that are only in common fields from Rel-17 onwards? As mentioned above, UE should be able to ignore the ASN.1 of the common fields. Defining UE capability for each of these seems a more complex approach to us.  The other approach is to continue with Rel-16 behaviour proposed for the future: that network does not signal common fields where UE capability is defined. And UE ignores common fields without UE capability. This mixed approach can be confusing and seems unnecessary to us. |
| OPPO | Agree, and same view as MTK above for the detailed cases. |

## 1.5 Potential exceptions

It is the intention of the rapporteur that the proposals presented above should make up principles which cover all cases. The rapporteur invites companies to provide exceptions or examples where the outlined principles would not be beneficial to the operation of the system.

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| **Company** | **Comment** |
| Samsung | We would like to ask whether *dedicatedSIB1-Delivery* which is also part of the *RRCReconfiguration* message is also subject to the requirement. Note that we are not challenging the proposal 2 above, but merely want to have clear understanding for all the cases. |
| Qualcomm Incorporated | To Samsung’s comment. We understand the UE decoding behaviour for SIB1 delivered via *dedicatedSIB1-Delivery* should be the same as the SIB1 reception from the broadcast. The difference is merely for the delivey method. Therefore no need for the network to modify the content. |
| MediaTek | For the dedicate SIB1 content included *dedicatedSIB1-Delivery*, we prefer to have the same values as SIB1 in broadcasted. This makes the concept simpler. |
| Ericsson | We agree with Qualcomm and Mediatek. |
| Intel | Agree that dedicated SIB delivery should be the same as broadcast. |

## 1.6 Other issues

The rapporteur invites companies to provide other related issues that RAN2 should settle.

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| **Company** | **Comment** |
| Ericsson | At RAN2#114 there was an issue raised relating to delta signalling. Indeed, all fields in the xxxCommon IEs should have been marked as “Need R”, i.e., one should not have tried to define delta signalling for any of those. Fortunately, there does not seem to be any real problem since the field descriptions were adjusted late in Rel-15 to overcome potential problems.  Anyway, for all fields added in xxxCommon IEs in future, RAN2 should use Need R. |
| MediaTek | We agree that optional fields in boradcast message should be Need R. There is no delta configruation for two broadcast message. However, for handover case, should the UE release the parameter based on SIB1 Need R if the parameter is configruaed in dedicated message? (See case 3.1, Our view – NO, UE should not release). |
| Ericsson | Comment to Mediatek: No need for changes to existing ASN.1 at the moment, but we should remember to use Need R for new additions. |
| Huawei, HiSilicon | We wonder if there is a real issue found in the field for Need codes in ServingCellConfigCommon (if there is, it should have been a serious one that makes NR not workable).  This is also an envidance that the UE should treat ServingCellConfigCommon like ServingCellConfigCommonSIB, i.e. ignore the configuration not supported by itself. |
| Intel | MediaTek comment is not clear to us. Is the comment that if the common field for the target cell contained a field that is not present in SIB1 of the target cell, should the UE release the value? Firstly, such mismatch is unlikely. But in terms of UE behaviour, we think UE should follow the configuration in SIB1 after it reads SIB1 – that is, if the field is not present in SIB1 and it is Need R (as SIB fields are), UE should release the configuration. Otherwise, target will never be able to release a common configuration provided in HO command? |
| OPPO | We understand the issue of need-R is essentially an issue how to interpret the configuration when an new configuration arrives with the absence of a specific field, when the new configuration and the old configuration are SIB (or dedicated signaling) and dedicated signaling (or SIB) respectively, limited to the case of UE supporting the capability. This is somehow related to the case 3.1 and 4.1 in MTK reply. |

# 2 Conclusion

TBD.