3GPP TSG-RAN WG2 #115-e electronic R2-210xxxx

Electronic, 1 – 12 Nov 2021

Agenda Item: Tbd

Source: Ericsson

Title: [Post115-e][054][NR15] Common Fields Dedicated Signalling (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [Post115-e][054][NR15] Common Fields Dedicated Signalling (Ericsson)

 Scope: Continue discussion from baseline at R2 115-e.
1) to address specific issues, such as SUL/IAB.

 2) to find an agreeable description of the desired behaviour, e.g. a generic statement such as: “Fields that are dedicated configurations should be subject to UE capability check (regardless IE name). Fields that are cell specific configurations, but also distributed in dedicated signalling does not need to be subject to UE capability check”; OR e.g. a list of fields and how each should be handled, OR both/combination.

 Intended outcome: Report

 Deadline: Long

Deadline: October 21th, 0900 UTC

Contact person(s) for each participating company:

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| **Company** | **Email** |
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# 2 Discussion

## 2.1 Agreements reached so far

At RAN2-115e the following agreements were captured in the chairman notes:

* **Fields that are present in ServingCellConfigCommon delivered by dedicated signalling shall have the same value as the corresponding field in SIB1.**
* **Confirm that dedicatedSIB1-Delivery shall have the same fields and values as the broadcasted SIB1.**

According to the first agreement above, the need for alignment with SIB1 applies only for the bold fields in the RRCReconfiguration message:

1> RRCReconfiguration-IEs

2> secondaryCellGroup (type *CellGroupConfig*)

3> spCellConfig

4> reconfigurationWithSync

5> **spCellConfigCommon** (type ServingCellConfigCommon)

3> sCellToAddModList

4> **sCellConfigCommon** (type ServingCellConfigCommon)

2> nonCriticalExtension (RRCReconfiguration-v1530-IEs)

3> masterCellGroup (type *CellGroupConfig*)

4> spCellConfig

5> reconfigurationWithSync

6> **spCellConfigCommon** (type ServingCellConfigCommon)

4> sCellToAddModList

5> **sCellConfigCommon** (type ServingCellConfigCommon)

The **content of fields outside those occurrences of ServingCellConfigCommon is independent of values configured in MIB or SIB and it is subject to capability validation**. And this is independent of the names of those fields or types, i.e., it applies even if the name of the containing IE ends with „*Common*“. Prominent examples are ...

1> RRCReconfiguration-IEs

1> nonCriticalExtension (RRCReconfiguration-v1530-IEs)

2> masterCellGroup (type CellGroupConfig)

3> spCellConfig

4> spCellConfigDedicated

5> downlinkBWP-ToAddModList

6> bwp-**Common** (type BWP-DownlinkCommon)

7> pdcch-Config**Common**

7> pdsch-Config**Common**

5> uplinkConfig

6> uplinkBWP-ToAddModList

7> bwp**-Common**

5> supplementaryUplink

6> uplinkBWP-ToAddModList

7> bwp-**Common**

## 2.2 Remaining issues

### 2.2.1 Need to omit fields in ServingCellConfigCommon

The agreements cited in section 2.1 state that fields in *RRCReconfiguration-> ...-> ServingCellConfigCommon* shall have the same values as in the corresponding SIB. However, it has been suggested that the gNB should **omit** fields in those IEs for which the UE does not support the corresponding functionality.

In the recent discussions some companies said that a UE should in any case be able to parse the ASN.1 even if it does not support the functionality associated to some of the contained fields. Hence, it should be easy for a UE to accept the RRCReconfiguration even if it does not comprehend the purpose of some of the fields in ServingCellConfigCommon.

However, one company raised the concern that the (unfortunate) use of “Need M” on various levels of ServingCellConfigCommon would require that a UE handles those fields in terms of delta signalling.

Example: A UE does not support SUL on the band of the current PCell but the cell provides *supplementaryUplinkConfig* in *ServingCellConfigCommon* and in *ServingCellConfigCommonSIB*. Since the UE does not support the feature, it could in principle ignore the fields in ASN.1. However, if the network triggers an inter-frequency handover to a PCell on which the UE supports SUL and on which the network uses SUL, the UE must have maintained the *supplementaryUplinkConfig* of the source cell to correctly interpret the delta configuration obtained from the target cell in *ServingCellConfigCommon*.

**Q1: Should the gNB omit fields in “*RRCReconfiguration-> ...-> ServingCellConfigCommon*” and/or in “*dedicatedSIB1-Delivery*” for which the UE does not support the corresponding feature? If not, is the UE required to handle delta signalling (Need M) for those fields?**

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| **Company** | **Comments** |
| Ericsson | No, the gNB should not be required to omit those fields. The intention has always been that the fields in ServingCellConfigCommon are treated as if the UE had received them via system information. This means that the gNB should provide the same value as in SIB1 (otherwise the UE would override the value with the value found in SIB1 of the target cell) and that the gNB does not need to validate them against the UE capabilities. For some fields the gNB could in principle omit the value if the UE does not support the associated feature according to its capabilities. However, for some fields no capability bit exists. Introducing a capability bit later is not backwards compatible. We agree to the complication due to the use of Need M in ServingCellConfigCommon and its child IEs. However, in the example with *supplementaryUplinkConfig* the UE supports the feature on another band and hence knows how to deal with the delta signalling of those parameters. For all future additions to ServingCellConfigCommon (including all child IEs) RAN2 should use “Need R” and “Need N” only. |
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It has been mentioned that some legacy UEs cause problems when they detect certain fields in ServingCellConfigCommon (e.g. due to the above-mentioned challenges related to delta signalling).

**Q2: Is there a need to introduce exceptions for dealing with issues identified in legacy UEs?**

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| **Company** | **Comments** |
| Ericsson | Preferably not. But if legacy UEs are known to have issues with presence of individual fields or with handling delta signalling thereof, we are open for work-arounds.  |
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To avoid the above-mentioned problems in future and to simplify the handling of the fields in *ServingCellConfigCommon* and *ServingCellConfigCommonSIB*, it seems advisable to mark all optional fields added to those two IEs in future with “Need R” or “Need N”. In this context it should be noted that section 6.1.2 of 38.331 says already: “*Any field with Need M or Need N in system information shall be interpreted as Need R*”.

**Q3: Should all optional fields added in future to ServingCellConfigCommon and ServingCellConfigCommonSIB (including their child IEs) be marked as “Need R” or “Need N” (not as “Need M”)?**

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| **Company** | **Comments** |
| Ericsson | Yes!  |
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# 4 Conclusion

<To be added later>