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Electronic meeting, 2021-08-16 - 2021-08-27

Agenda Item: 8.9.3 Other aspects RAN2 impacts

Source: Ericsson

Title: Summary of 8.9.3 - Other aspects RAN2 impacts

Document for: Discussion, Decision

# 1 Introduction

This document summarizes agenda item 8.9.3, **including** [**R2-2108263**](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2108263.zip) (moved to 8.9.3) **excluding** [**R2-2108013**](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2108013.zip) **and** [**R2-2107409**](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_114-e/Docs//R2-2107409.zip). Meaning that the following documents are covered in this summary:

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| [R2-2108535](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108535.zip) | Considerations on TRS/CSI-RS occasion(s) for idle/inactive UE(s) | CMCC |
| [R2-2108030](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108030.zip) | Discussion on potential TRS/CSI-RS | Huawei, HiSilicon |
| [R2-2107070](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107070.zip) | Discussion on signaling aspects of TRS/CSI-RS occasion(s) for idle/inactive Ues | OPPO |
| [R2-2107536](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107536.zip) | Discussion on TRS CSI-RS for RRC-IDLE and RRC-INACTIVE State UE | Xiaomi Communications |
| [R2-2107408](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107408.zip) | Discussion on TRS CSI-RS in idle inactive mode | vivo |
| [R2-2108063](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108063.zip) | Discussion on TRS/CSI-RS configuration of idle/inactive-mode UEs | Sony |
| [R2-2108687](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108687.zip) | Further Consideration on Configuration of TRS/CRI-RS | CATT |
| [R2-2108271](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108271.zip) | Further Consideration On TRS and CSI-RS for idle and inactive UE | ZTE Corporation |
| [R2-2107537](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107537.zip) | LS to RAN1 on TRS CSI-RS for RRC-IDLE and RRC-INACTIVE State UE | Xiaomi Communications |
| [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip) | Provision of TRS Configurations to UEs in idle and inactive | Ericsson |
| [R2-2108240](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108240.zip) | TRS Availability Signaling to UEs in idle and inactive | Ericsson |
| [R2-2107550](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107550.zip) | TRS/CSI-RS configuration and availability for idle/inactive-mode UE | Intel Corporation |
| [R2-2107901](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107901.zip) | TRS/CSI-RS configuration for Idle/inactive mode UE | Lenovo, Motorola Mobility |
| [R2-2107596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107596.zip) | TRS/CSI-RS signalling aspects for IDLE/INACTIVE UEs for enhanced power save | Apple |
| [R2-2107001](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107001.zip) | TRS\_CSIRS for RRC IDLE and RRC INACTIVE | Samsung Electronics Co., Ltd |
| [R2-2108263](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108263.zip) | Potential TRS/CSI-RS occasion(s) | Nokia, Nokia Shanghai Bell |

# 2 Discussion

## 2.1 Which SIB provides the TRS/CSI-RS config

RAN2 should decide if a new or existing SIB should provide the TRS/CSI-RS configurations.

All papers touching this topic ([R2-2107001](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107001.zip), [R2-2107408](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107408.zip), [R2-2107536](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107536.zip), [R2-2107537](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107537.zip), [R2-2107550](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107550.zip), [R2-2107596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107596.zip), [R2-2107901](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107901.zip), [R2-2108030](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108030.zip), [R2-2108063](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108063.zip), [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip), [R2-2108271](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108271.zip), [R2-2108687](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108687.zip)) suggest to use a new SIB.

Example motivations for a new SIB compared to an existing SIB:

* The TRS/CSI-RS information does not belong well with any existing SIB
* UEs not supporting this feature should not be impacted

Hence it is proposed:

1. [Easy] The TRS/CSI-RS configuration is provided in a new SIB.

## 2.2 Dedicated signalling of TRS/CSI-RS config

The TRS/CSI-RS configuration can be provided in system information. But it is discussed if also dedicated signalling should be used.

**Only broadcast:**

Samsung [R2-2107001](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107001.zip), OPPO [R2-2107070](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107070.zip), Xiaomi [R2-2107536](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107536.zip), ZTE [R2-2108271](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108271.zip), CATT [R2-2108687](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108687.zip) argue that it is sufficient to rely on system information. Their main arguments are:

* A dedicated config received in connected mode will be obsolete after a cell change, potentially obsolete after a certain period of time.
* If the network need to change a configuration which was provided to a UE with dedicated signalling because it has become obsolete, would need to page the UE to change it.
* It causes additional complexity.

**Also dedicated:**

Vivo [R2-2107408](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107408.zip), Apple [R2-2107596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107596.zip), Sony [R2-2108063](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108063.zip), argue that additional power saving can be achieved by having dedicated signalling of TRS/CSI-RS configurations. Details on how dedicated configurations could interwork with the broadcasted configurations are not fully described though.

**Non-conclusive / if time allows:**

Huawei [R2-2108030](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108030.zip), Ericsson [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip), CMCC [R2-2108535](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108535.zip), are either non-conclusive in their proposals or want to consider dedicated signalling if time allows.

Since there is no clear proposal on the table **how** a dedicated signalled configuration could inter-work with the broadcasted configuration, the rapporteur proposes:

1. [To discuss] RAN2 assumes that TRS/CSI-RS configurations are only broadcasted. Potential addition of dedicated signalling can be discussed in a later meeting if time allows.

## 2.2 Updating the TRS/CSI-RS config

Another topic being discussed in the contributions to this meeting is how the TRS/CSI-RS configuration(s) (not TRS/CSI-RS availability) can be updated.

**Legacy SI mechanism:**

Nokia [R2-2108263](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108263.zip), OPPO [R2-2107070](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107070.zip), vivo [R2-2107408](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107408.zip), Xiaomi [R2-2107536](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107536.zip), Intel [R2-2107550](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107550.zip), Ericsson [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip), CATT [R2-2108687](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108687.zip) claims that the legacy SI update procedure is sufficient to change the TRS/CSI-RS configurations.

**Short message:**

Samsung [R2-2107001](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107001.zip) suggests using a separate short message indication to indicate an SI change of TRS/CSI-RS configuration(s).

**Open to optimizations:**

Huawei [R2-2108030](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108030.zip) are open to consider potential optimizations for SI change of TRS/CSI-RS configuration(s).

Assuming that the legacy SI update procedure is the baseline and that it works (at least sufficiently) well. The legacy SI update procedure can perhaps be considered a baseline. Based on the input documents, it seems difficult to reach consensus around any particular optimization on this topic. With that it is proposed:

1. [To discuss] The legacy SI update procedure is used for changing TRS/CSI-RS configurations.

## 2.4 TRS/CSI-RS availability indication

Above it was discussed how TRS/CSI-RS configurations can be updated. However, indicating **availability** of TRS/CSI-RS is still up for discussion. RAN1 are discussing a L1 based availability indication. But RAN1 are also discussing a SIB based indication.

**Postpone until more RAN1 progress:**

Samsung [R2-2107001](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107001.zip), Ericsson [R2-2108240](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108240.zip), OPPO [R2-2107070](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107070.zip) suggests to postpone this discussion until further progress has been reached in RAN1.

**Paging PDCCH:**

vivo [R2-2107408](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107408.zip) proposes that TRS/CSI-RS availability can be indicated in paging PDCCH.

**Presence/absence of new SIB:**

Xiaomi [R2-2107536](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107536.zip) proposes that presence/absence of the SIB with the TRS/CSI-RS configurations will indicate availability of the TRS/CSI-RSs.

**Time info:**

Lenovo [R2-2107901](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107901.zip) proposes that time-information is provided which indicate during which times TRS/CSI-RS is available and not. Nokia [R2-2108263](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108263.zip) are in their paper discussing a time table-approach for availability.

Based on the papers above, there seem that currently there is no consensus about which direction to take with regards to TRS/CSI-RS availability in RAN2. It is expected that RAN1 will continue their discussions on this topic. RAN2 can of course discuss the topic further in the future, however at this point in time it seems not easy to reach any consensus around any of the proposals on the table in this RAN2 meeting.

It is therefore proposed that the topic is postponed for now, which hopefully is an easy agreement considering the diverging input:

1. [Easy] Postpone the topic about TRS/CSI-RS availability until a later meeting when RAN1 also has progressed.

## 2.5 Miscellaneous

Below are topics which only a few companies brought up in their papers.

### 2.5.1 On demand SI for SIB with TRS/CSI-RS information

Two papers are proposing that the SIB with TRS/CSI-RS information could be configured to be sent on-demand.

Apple [R2-2107596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107596.zip) suggests that this would be beneficial since only UEs that would be interested in the information would acquire the SIB.

Ericsson [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip) that on-demand for this SIB is motivated by that the network may not want to broadcast the SIB unless there is a UE which needs it.

1. [To discuss] RAN2 to discuss if on demand SI should be possible for the SIB with TRS/CSI-RS information.

### 2.5.2 Segmentation of TRS/CSI-RS SIB

Apple [R2-2107596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107596.zip) says that the TRS/CSI-RS information may be very large and hence they suggest to support segmentation for the SIB. Other companies have not provided any view on this topic. We note though that RAN1 are still discussing the actual content of the SIB, meaning that it may be too early to make any agreement with regards to the need for segmentation. Given this it is proposed:

1. [To discuss] Postpone the discussion on segmentation of the new SIB until RAN1 has sent the list of the parameters and a potential structure.

### 2.5.3 Split configuration

Huawei [R2-2108030](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108030.zip) proposes that the TRS/CSI-RS information should be split in to a common part and an RS-specific part and that the details of this would depend on RAN1 progress. This, as also indicated by Huawei, depends on RAN1 progress and hence can be postponed to a later RAN2 meeting. If the rapporteur has understood Huawei's view correctly, it should probably be an easy agreement that this is postponed.

1. [Easy] Postpone the discussion on splitting the TRS/CSI-RS information to a common and RS-specific part until RAN1 has sent the list of the parameters and a potential structure.

### 2.5.4 RAN1 parameters

Ericsson [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip) proposes to wait for RAN1 to provide the complete list of parameters needed for TRS/CSI-RS configuration. Other companies seem to have the same understanding without mentioning it.

1. [Easy] RAN2 expects to get the list of parameters from RAN1 for the TRS/CSI-RS configuration info.

### 2.5.5 Area specific SI for TRS/CSI-RS configuration

Ericsson [R2-2108239](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108239.zip) proposes to discuss if the SIB with the TRS/CSI-RS configuration should be area-specific. However, if that discussion is needed it could perhaps be postponed to a later meeting.

1. [Easy] Postpone the discussion about if special handling is needed w.r.t. area specificity for TRS/CSI-RS configuration.

# 3 Conclusion

Based on the discussion in the previous sections we propose the following:

[Proposal 1 [Easy] The TRS/CSI-RS configuration is provided in a new SIB.](#_Toc79497198)

[Proposal 2 [To discuss] RAN2 assumes that TRS/CSI-RS configurations are only broadcasted. Potential addition of dedicated signalling can be discussed in a later meeting if time allows.](#_Toc79497199)

[Proposal 3 [To discuss] The legacy SI update procedure is used for changing TRS/CSI-RS configurations.](#_Toc79497200)

[Proposal 4 [Easy] Postpone the topic about TRS/CSI-RS availability until a later meeting when RAN1 also has progressed.](#_Toc79497201)

[Proposal 5 [To discuss] RAN2 to discuss if on demand SI should be possible for the SIB with TRS/CSI-RS information.](#_Toc79497202)

[Proposal 6 [To discuss] Postpone the discussion on segmentation of the new SIB until RAN1 has sent the list of the parameters and a potential structure.](#_Toc79497203)

[Proposal 7 [Easy] Postpone the discussion on splitting the TRS/CSI-RS information to a common and RS-specific part until RAN1 has sent the list of the parameters and a potential structure.](#_Toc79497204)

[Proposal 8 [Easy] RAN2 expects to get the list of parameters from RAN1 for the TRS/CSI-RS configuration info.](#_Toc79497205)

[Proposal 9 [Easy] Postpone the discussion about if special handling is needed w.r.t. area specificity for TRS/CSI-RS configuration.](#_Toc79497206)