3GPP TSG-RAN WG2 #115e Tdoc R2-210XXXX

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

Agenda Item: 8.9.3 Other aspects RAN2 impacts

Source: Ericsson

Title: Report of [AT115-e][044][ePowSav]

Document for: Discussion, Decision

# 1 Introduction

This document is a report from the following email discussion:

* [AT115-e][044][ePowSav] TRS CSIRS for RRC Idle and Inactive (Ericsson)

      Scope: Treat R2-2109037. Attempt Agreements based on the proposals in the summary.

      Intended outcome: Agreements, Report

      Deadline: Tuesday W2 (CB only if needed).

The intention is to treat the summary in [R2-2109037](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_115-e/Docs//R2-2109037.zip).

The discussion covers the documents in 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:

|  |  |  |
| --- | --- | --- |
| [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 Contact information

For those who provide input to this email discussion, please provide your contact information below:

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email** |
| Ericsson | Mattias Bergström | mattias.a.bergstrom@ericsson.com |
| Qualcomm | Linhai He | linhaihe@qti.qualcomm.com |
| Samsung | Anil Agiwal | anilag@samsung.com |
| MediaTek | Li-Chuan TSENG | li-chuan.tseng@mediatek.com |
| Nokia | Jussi Koskinen | jussi-pekka.koskinen@nokia.com |
| Huawei, HiSilicon | Yiru Kuang | kuangyiru@huawei.com |
| CATT | Pierre Bertrand | pierrebertrand@catt.cn |
| Intel | Seau Sian Lim | seau.s.lim@intel.com |
| LGE | SangWon Kim | sangwon7.kim@lge.com |
| vivo | Chenli | Chenli5g@vivo.com |
| OPPO | Haitao Li | lihaitao@oppo.com |
| Sharp | Lei Liu | [lei.liu@cn.sharp-world.com](mailto:lei.liu@cn.sharp-world.com) |
| Apple | Sethuraman Gurumoorthy | sethu@apple.com |
| DENSO | Tatsuki Nagano | tatsuki.nagano.j7f@jp.denso.com |
| Sequans | Noam Cayron | noam.cayron@sequans.com |
| Sony | Anders Berggren | Anders.Berggren@sony.com |

# 3 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.

This is a non-controversial proposal. Please provide comments on the proposal above:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y |  |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | Y |  |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y |  |
| LGE | Y |  |
| vivo | Y | We prefer to introduce a new SIB for IDLE/INACTIVE TRS/CSI-RS configuration. And whether all TRS/CSI-RS configurations (e.g. all beams or all UEs) or partial TRS/CSI-RS configurations will be included in the new SIB should be further studied. |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | Y |  |
| DENSO | Y |  |
| Sequans | Y |  |
| Sony | Y |  |

## 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.

Note: if the above is agreed it is **not** excluded that we in a later meeting add dedicated signalling later, if an agreeable proposal emerges. With this in mind, please comment on the proposal above:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y |  |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | N | We understand if dedicated signalling can be further discussed in later meeting, then we cannot conclude that “TRS/CSI-RS configurations are only broadcasted“. We would suggest to update proposal 2 as below:  RAN2 assumes that TRS/CSI-RS configurations are ~~only~~at least broadcasted. Potential addition of dedicated signalling can be discussed in a later meeting ~~if time allows~~. |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y |  |
| LGE | Y |  |
| vivo | - | In our understanding, the SIB may not contain all TRS configurations, and there is high probability that network could provide the same TRS/CSI-RS configuration in connected mode when release/suspend UEs. When the SIB doesn’t contain the optimal TRS/CSI-RS configuration for a UE and the dedicated signalling is not allowed, then the UE may not acquire the power saving gain using idle TRS/CSI-RS.  Hence, we think potential addition of dedicated signalling to provide the optimal TRS/CSI-RS configuration for the UE has flexibility.  We can accept the proposal with the following revision if the majority agree to discuss dedicated signalling in a later meeting:  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. |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | N | We feel that the current wording “TRS/CSI-RS configurations are only broadcasted“, and “if time allows”seems too restrictive and precludes any potential improvements to have dedicated signaling.  Agree with Vivo and Huawei that a wording change to ensure that the dedicated signaling can be further discussed would be a reasonable way forward |
| DENSO | Y |  |
| Sequans | Y | Meaning is clear from the wording, but OK to replace “only” with “at least” |
| Sony | N | We think the TRS/CSI-RS configuration can be included in dedicated RRC release message. |

## 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.

There are three groups of proposals for how to update the TRS/CSI-RS configurations, legacy SI mechanism, use of a separate indication in the short message, and other optimizations. Please provide your view on how we should proceed:

|  |  |  |
| --- | --- | --- |
| **Company** | **Preferred approach: [Legacy, Short message indication, other]** | **Comments** |
| Qualcomm | Legacy |  |
| Samsung | Short message indication | New SIB is used to include TRS/CSI-RS configurations. Indication specific to this SIB update is included in Short message to avoid impact to UEs not supporting this new SIB. |
| MediaTek | Legacy |  |
| Xiaomi | Legacy | If SIB is used for the configuration, it will not be changed frequently. So the impact on the legacy UE can be accepted. Even if SIB signalling for TRS/CSI-RS occasion configuration can be potentially linked with the availability indication, we think it is for the case that availability indication is not changed frequently while in this case L1 based availability indication is not configured.  We think whether SIB is used for the configuration or for the availability information, for both cases, they are not changed frequently. The existing SIB update mechanism is sufficient. |
| Nokia | Legacy | We think that legacy SIB update is sufficient. |
| Huawei, HiSilicon | Open to optimizations | In the legacy procedure, the system information can only be modified at certain time boundaries, which means that the network will not be able to modify the TRS/CSI-RS configuration at any time. These reference signals, however, are originally for connected-mode UEs. The constraint caused by the configuration update procedure may affect the use of TRS/CSI-RS for connected-mode UEs. Enhancements may be necessary to allow the network to complete the TRS/CSI-RS configuration update procedure with less delay. |
| CATT | Legacy | We don’t expect the configuration (and even the availability) to change often, hence the legacy SI update mechanism is well suited for addressing the TRS/CSI-RS configuration update. |
| Ericsson | Legacy |  |
| Intel | Legacy | Even if availability indication is part of the TRS/CSI-RS configuration, our understanding is that it may not be frequent. Hence we are fine with existing SIB update mechanism |
| LGE | Legacy |  |
| vivo | Legacy with comments | Since RAN1 has agreed to further study SIB based signaling for configuration and availability information of TRS/CSI-RS.  If the availability doesn’t change frequently or SIB doesn’t used for availability, the impact of using legacy SI change mechanism is limited. In this way, we think legacy SI change mechanism is enough. Otherwise, we may need further optimization.  Thus, before we concluded on this issue, we could firstly determine whether SI will be used for availability and whether the availability change frequently. |
| ZTE | Legacy |  |
| OPPO | Legacy |  |
| Sharp | Legacy | And if TRS/CSI-RS also can be used in eDRX, SI update may need to further check. |
| Apple | Legacy |  |
| DENSO | Legacy | Legacy SI update procedure is sufficient if TRS/CSI-RS configuration doesn’t changed frequently. |
| Sequans | Short message, but OK with legacy | Though prefer to add e.g. “as baseline”. Since design of TRS is not finished we think its more prudent to leave an opening for changing this. |
| Sony | Legacy |  |

## 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.

Please provide comments on the proposal:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y |  |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | Y |  |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y |  |
| LGE | Y |  |
| vivo | Y |  |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | Y |  |
| DENSO | Y |  |
| Sequans | Y |  |
| Sony | Y |  |

## 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.

Please provide your view on whether on demand SI should be possible for the SIB with TRS/CSI-RS:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y | Follow exist framework. Network indicates whether SIB is rovideded periodically or rovided on demand. |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | Y |  |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y | Like Samsung, we assume that this is referring to existing on-demand SI. |
| LGE | Y |  |
| vivo | Y | The SIB with TRS/CSI-RS could be configurable with broadcast or on-demand at the gNB. |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | Y |  |
| DENSO | Y |  |
| Sequans | Y | Agree with above |
| Sony | Y |  |

### 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 supporting 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.

Please provide comments on the proposal:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y |  |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | Y |  |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y |  |
| LGE | Y |  |
| Vivo | Y |  |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | Y |  |
| DENSO | Y |  |
| Sequans | Y |  |
| Sony | Y |  |

### 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.

Please provide comments on the proposal:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y |  |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | Y |  |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y |  |
| LGE | Y |  |
| Vivo | Y |  |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | Y |  |
| DENSO | Y |  |
| Sequans | Y |  |
| Sony | Y |  |

### 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.

Please provide comments on the proposal:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | Y |  |
| Samsung | Y |  |
| MediaTek | Y |  |
| Xiaomi | Y |  |
| Nokia | Y |  |
| Huawei, HiSilicon | Y |  |
| CATT | Y |  |
| Ericsson | Y |  |
| Intel | Y |  |
| LGE | Y |  |
| Vivo | Y |  |
| ZTE | Y |  |
| OPPO | Y |  |
| Sharp | Y |  |
| Apple | Y |  |
| DENSO | Y |  |
| Sequans | Y |  |
| Sony | Y |  |

### 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.

Please provide comments on the proposal:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree [Y/N]** | **Comments** |
| Qualcomm | - | We don’t support this egacyl. If we‘ve understood it correctly, it means that the new SIB introduced in P1 can include different configuration information on different beams. This is not desirable for UEs, because Ues may have to process SIBs on multiple beams to decide which one to use. It is much simpler if network transmits the same information of all TRS/CSI-RS on all beams (as for all legacy SIBs). |
| Samsung | Y | Our understanding is that SIB carrying TRS/CSI-RS configuration can be cell specific or area specific. In the existing SI delivery framework, network indicates in SIB1 for each SIB whether the SIB is cell specific or area specific. Same framework can be followed for SIB carrying TRS/CSI-RS configuration |
| MediaTek | Y |  |
| Xiaomi | - | SIB carrying TRS/CSI-RS configuration can only be cell specific.  The available TRS/CSI-RS is shared by UE in connected mode to the UE in idle/inactive. We think different cells will have different Ues in connected mode. It is not likely they provide the same available TRS/CSI-RS resources. |
| Nokia | - | TRS/CSI-RS is for connected mode Ues and idle/inactive Ues can use it. This information may not be cell specific. |
| Huawei, HiSilicon | - | OK to postpone and this should be discussed in RAN1. |
| CATT | N | We are not sure why we need to discuss this at all. In our understanding, SIB1 already has an indicator (*areaScope*) per SIB indicating if the SIB is area specific or cell specific, and it is left to gNB implementation to set it properly. Then basically the proposal is already implemented, as for any SIB, if we agree to carry the TRS/CSI-RS config in a new SIB. So we don’t get what we need to discuss. Or do we misunderstand the proposal? |
| Ericsson | Y | We can postpone this. |
| Intel | Y | Like others, we are wondering whether this is referring to the existing area scope for SIB? If so there is no need to discuss further. |
| LGE |  | Even though area specific TRS/CSI-RS configuration is supported, the egacy mechanism, i.e. area specific SIB, is suffucuent. |
| Vivo | Y |  |
| ZTE | - | Tend to agree with CATT, we already have a new SIB for CSI-RS/TRS config, it is up to gNB implementation to decide whether it is area specific or cell specific according to the SIB1. Therefore, if there is anything changed in RAN2 it shall be raised from RAN1. |
| OPPO | N | Agree with CATT. |
| Sharp | - | Whether “area” here means the existing area in SIB1 is not clear and more clarification is helpful. |
| Apple | N | Agree with CATT |
| DENSO | Y | The new SIB introduced for TRS/CSI-RS configuration can be area specific SIB similar to the existing framework. |
| Sequans | Y |  |
| Sony | Y |  |

# 3 Conclusion

**To be updated**: [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.](#_Toc80178820)

[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.](#_Toc80178821)

[Proposal 3 [To discuss] The legacy SI update procedure is used for changing TRS/CSI-RS configurations.](#_Toc80178822)

[Proposal 4 [Easy] Postpone the topic about TRS/CSI-RS availability until a later meeting when RAN1 also has progressed.](#_Toc80178823)

[Proposal 5 [To discuss] RAN2 to discuss if on demand SI should be possible for the SIB with TRS/CSI-RS information.](#_Toc80178824)

[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.](#_Toc80178825)

[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.](#_Toc80178826)

[Proposal 8 [Easy] RAN2 expects to get the list of parameters from RAN1 for the TRS/CSI-RS configuration info.](#_Toc80178827)

[Proposal 9 [Easy] Postpone the discussion about if special handling is needed w.r.t. area specificity for TRS/CSI-RS configuration.](#_Toc80178828)

**]**