3GPP TSG-RAN WG2 #112e R2-20xxxxx

Electronic meeting, November 2nd – 13th 2020

Agenda Item: 6.1.1

Source: Ericsson

Title: Summary of [AT112-e][039][NR16] SI acquisition

Document for: Discussion, Decision

# 1 Introduction

This document is to kick off the following email discussion:

* [AT112-e][039][NR16] SI acquisition (Ericsson)

 Scope: Treat remaining aspects of papers under 6.1.1 “SI Acquisition”. Identify agreeable parts and agree them. For agreed parts, agree revised CRs.

 Intended outcome: Report, agreed CRs.

 Deadline: Agreements ready at EOM, Rapporteur may set intermediate deadlines

**Deadline Phase 1:** Collect companies’ views and formulate proposals, by Friday November 6th 12:00 UTC

**Deadline Phase 2:** Further review proposals and related CRs, by Thursday November 12nd 1100 UTC

# 2 Discussion

During the online session on Monday this topic was treated online and a preliminary agreement was made. Here you can find the summary of the discussion plus the agreement:

SI acquisition

[R2-2010272](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2010272.zip) Correction on acquisition of MIB and SIB1 Huawei, HiSilicon, Ericsson CR Rel-16 38.331 16.2.0 2198 - F NR\_pos-Core

[R2-2009101](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009101.zip) Corrections to SI acquisition in RRC\_CONNECTED Samsung Electronics Co., Ltd CR Rel-16 38.331 16.2.0 2033 - F 5G\_V2X\_NRSL-Core, NR\_pos-Core

DISCUSSION on the two CRs above, Mon NOV 2.

- Ericsson believe that if the first doc is agreed then the second doc is not needed. MTK agrees but think the text need to be changed also in the second CR, remove the word “stored”. Intel agrees.

- LG think a UE monitors notifications, and think a UE will know when SIB1 is modified and there is no issue to resolve (SS CR)

- QC think it is strange to say from current modification period, but for pos modification period does not apply so UE may need to acquire outside Mod period, but for legacy no need.

- Nokia wonder why a UE would need to acquire SIB1 again and again

- Samsung think there is no intention to impact legacy, the affected text is only executed for the R16 Si acq in connected. QC think we should be careful, and think the CR indeed change legacy behaviour. Samsung think there is some confusion there is no side effect.

- CATT think the refe to modification period in SS CR is not correct, and think it is up to UE implement when to get SIB1.

- Samsung think that 10272 says that the UE then need to always acquire SIB1. Huawei think that the Bcast status may change during modification period, and think that SIB1 would be acquired based on need from upper layer. Ericsson agrees. Samsung think we should specify the condition for acquiring SIB1. Huawei think the SIB1 would just be additionally acquired when application SIB is required.

- Chair: There seems to be support for changes in 10272.

* When UE trigger SIB acquisition in Connected and SIB Bcast status is nonbroadcast, then the UE shall acquire SIB1 without paying respect to modification period (same as Idle mode R15 procedure).

[R2-2009945](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009945.zip) Clarifications for the common search space on the active BWP Ericsson CR Rel-16 38.331 16.2.0 2146 - F NR\_newRAT-Core

Moved from 6.1.3

[R2-2009102](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009102.zip) Corrections to SI acquisition in IDLE\_INACTIVE Samsung Electronics Co., Ltd CR Rel-16 38.331 16.2.0 2034 - F 5G\_V2X\_NRSL-Core, NR\_pos-Core

Here is the following, we would like to ask companies to provide additional comments on the four CRs so to provide a revision, if needed.

## 2.1 Correction on acquisition of MIB and SIB1

[R2-2010272](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2010272.zip) Correction on acquisition of MIB and SIB1 Huawei, HiSilicon, Ericsson CR Rel-16 38.331 16.2.0 2198 - F NR\_pos-Core

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| --- | --- | --- |
| Company | Agree (Yes/No)? | Comments |
| Huawei, HiSilicon (Yinghao) | Yes | With the agreements made during the online discusison, the remaining issues is to what extent we shall specify the condition for the UE to acquire SIB1. During the meeting, some companies have proposed that the UE should not acquire the SIB1 again if it has already acquired SIB1 with broadcastStatus set to Broadcasting. We agree with this in principle, while we don’t think it is necessary to specify it in the description. IN IDLE mode R15 procedure, there is similar cases, while UE does not examine this condition and just acquire the SIB1. THis is shown in the following part of spec. 1> if the UE is in RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceSIB1* and *pagingSearchSpace* and has received an indication about change of system information; or1> if the UE is in RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceSIB1* and *pagingSearchSpace* and the UE has not stored a valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s), in accordance with sub-clause 5.2.2.1, and, UE has not acquired SIB1 in current modification period or if requested by upper layers; or1> if the UE is in RRC\_IDLE or in RRC\_INACTIVE; or1> if the UE is in RRC\_CONNECTED while T311 is running:2> if *ssb-SubcarrierOffset* indicates *SIB1* is transmitted in the cell (TS 38.213 [13]) and if *SIB1* acquisition is required for the UE:3> acquire the *SIB1,* which is scheduled as specified in TS 38.213 [13];3> if the UE is unable to acquire the *SIB1*:4> perform the actions as specified in clause 5.2.2.5;3> else:4> upon acquiring *SIB1*, perform the actions specified in clause 5.2.2.4.2.The CR can be agreed as it is. |
| Ericsson (Tony) | Yes (Proponent) | Agree with Huawei |
| Google | Yes | Same view as Huawei |
| Samsung | No | When UE decides to acquire a SIB, there are three cases:1) UE has not yet acquired SIB1 in current modifictaion period.2) UE has acquired SIB1 in current modification period and broadcastStatus is set to Broadcasting in this acquired SIB13) UE has acquired SIB1 in current modification period and broadcastStatus is set to notBroadcasting in this acquired SIB1Note that 'acquired SIB1' above can be the one received in dedicated signaling or broadcast signalingFor case 1 and 3, UE should acquire SIB1 again. For case 2, SIB 1 acquisition is not needed.The proponent proposed the correction as SIB1 acquisition is not specified for case 3. But the side effect of TP in CR is that it forces UE to acquire SIB1 even for case 2 which is unecessary.So if there is intention to make correction, suggestion is to modify as follows:1> if the UE is in RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceSIB1* and *pagingSearchSpace* and has received an indication about change of system information; or1> if the UE is in RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceSIB1* and *pagingSearchSpace* and the UE has not stored a valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s), in accordance with sub-clause 5.2.2.1, and, UE has not acquired SIB1 or broadcastStatus is set to notBroadcasting in the acquired SIB1 in current modification period or if requested by upper layers; or |
| Nokia | Partially Agree | The bullet that is being changed is about a UE in connected state that is in need of acquiring a SIB either because the UE does not have a valid version of the SIB stored in the UE or because the upper layers had requested the UE to acquire the SIB. Before the UE acquires the SIB it needs to check the broadcast status of the SIB, which requires the UE to read SIB1. If the UE has already acquired the SIB1 in the current modification period, then the UE can rely on the broadcast status of the SIB based on the already read SIB1 for that modification period. UE needs to read SIB1 only if it does not have a SIB1 in the current modification period. So, for connected state it is explicitly showing this check for prior availability of SIB1 in the current modification period. So, we see no problem with it and hence don’t see this change as essential. For idle, inactive state it does not show this explicit check but the same behaviour for checking broadcast status of a SIB applies in idle/inactive also.The removal of the paging search space check is OK since this bullet does not require the UE to look for SI change indication due to change in broadcast status of a SIB and we agree that such SI change notification is not sent for changes in broadcast status of SIBs. |
| Qualcomm Incorporated | Agree | The UE requirement that it must have the latest SIB1 to proceed to acquisition of SIBs is clear elsewhere. The current checking on whether SIB1 is received in the current modfication period looks redundant. |
| MediaTek | Agree |  |
| Apple | Agree | UE should not be limited to read SIB1 only once during one modificaiton period. We do nto have such a limitation in LTE |
| ZTE | Partly agree | 1. We agree with the first change.
2. For the second change, we share the same understanding with Samsung that the following cases should be considered.

Case 1: UE has not yet acquired SIB1 in current modification period.Case 2: UE has acquired SIB1 in current modification period and broadcastStatus is set to Broadcasting in this acquired SIB1Case3: UE has acquired SIB1 in current modification period and broadcastStatus is set to notBroadcasting in this acquired SIB1

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| UE behavior if we follow the original text |
| Case 1 | UE re-acquire SIB1 |
| Case 2 | UE continue to acquire other SIBs |
| Case 3 | * If the broadcast status remains to be notBroadcasting, UE will initiate SI request.
* If the broadcast status changes from notBroadcasting to Broadcasting while UE has not reacquire the latest SIB1 thus is not aware of the change, UE will initiate SI request but will stop sending the request after receiving the required SIB.
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| UE behavior if we follow this CR R2-2010272 |
| Case 1 | UE re-acquire SIB1 |
| Case 2 | UE re-acquire SIB1 and continue to acquire other SIBs |
| Case 3 | UE re-acquire SIB1 and continue to acquire other SIBs |

With the comparison above, if we follow this CR, unnecessary SIB1 re-acquisition would be power consuming for UE in case 2 and it is not clear which option would be better for UE (SIB1 re-acquisition VS unnecessary SI request) in case 3 but the UE behavior would be unified (i.e. to re-reacquire SIB1).From network’s perspective, either way is fine (keep the original text or follow this CR) and we slightly prefer the proposed changes in this CR. |
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## 2.2 Corrections to SI acquisition in RRC\_CONNECTED

[R2-2009101](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009101.zip) Corrections to SI acquisition in RRC\_CONNECTED Samsung Electronics Co., Ltd CR Rel-16 38.331 16.2.0 2033 - F 5G\_V2X\_NRSL-Core, NR\_pos-Core

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| --- | --- | --- |
| Company | Agree (Yes/No)? | Comments |
| Huawei, HiSilicon (Yinghao) | No | Our thinking is that SIB1 can be stored. The motivation for this is that when the broadcastStatus is set to Broadcasting in the current MP. While the correction seems redundant. When the UE is in CONNECTED and POS/V2X services triggers requirements for posSIB or V2X SIB, the UE would acquire the SIB1 if there is SIB1-SS or send SI request directly with dedicated signalling. with the first CR, it can be ensured that the SIB1 is acquired for hte current MP. The change is not needed |
| Ericsson (Tony) | No | As commented online, we believe that this CR is not needed as the CR in [R2-2010272](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2010272.zip) already address the issue. |
| Google | No | Same view as Ericsson. R2-2010272 already covers this issue. |
| Samsung | Yes (proponent) | CR [R2-2010272](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2010272.zip) is about when the SIB1 is acquired in connected. This CR is related to SI request.Lets say UE has acquired SIB1 in modification period 'n' and is stored. SIB X is needed in modification period 'n+1'. UE will initiate SIB1 acquisition as per section 5.2.2.3.1 in modification period 'n+1'. UE will also perform SI request procedure as per 5.2.2.3.5 in modification period 'n+1'. The intention of correction was to make sure that UE applies the procedure in 5.2.2.3.5 after reacquiring SIB1 as per section 5.2.2.3.1. |
| Nokia | No | We think the specification is already clear that the UE needs to use current SIB1 information to check the broadcast status of a SIB. This can be seen from the field description of si-BroadcastStatus. |
| Qualcomm Incorporated | No | The UE requirement that it must have the latest SIB1 to proceed to acquisition of SIBs is clear elsewhere.It should also be noted that the section 5.2.2.3.5, is executed either after acquisition of SIB1 (5.2.2.4.2 > 5.2.2.3.5) or via dedicatedSIB1-Delivery in RRCReconfiguration (5.3.5.3 > 5.2.2.4.2 > 5.2.2.3.5). So the wording "acquired in current modification period" as proposed in the CR is not always applicable. |
| MediaTek | No | If really necessary, we could just delete the “stored” in the wording“stored SIB1”. |
| Apple  | No | If change in R2-10272 is agreed, then this change is not necessary. |
| ZTE | No | Has been covered by the discussion in 2.1. |

## 2.3 Corrections to SI acquisition in IDLE\_INACTIVE

[R2-2009102](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009102.zip) Corrections to SI acquisition in IDLE\_INACTIVE Samsung Electronics Co., Ltd CR Rel-16 38.331 16.2.0 2034 - F 5G\_V2X\_NRSL-Core, NR\_pos-Core

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| Company | Agree (Yes/No)? | Comments |
| Huawei, HiSilicon (Yinghao) | No | Similar to the commetns for the second CR |
| Ericsson (Tony) | No | Similar comment as the CR in [R2-2009101](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009101.zip). Further, the changes for the IDLE/INACTIVE case (not related to positioning) are NBC since they impact Rel-15. |
| Google | No | Same comment as the CR in [R2-2009101](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2009101.zip). |
| Samsung | Yes | CR raises two issues:**Issue 1:** I understand the comments from HW/E/Google for Issue 1 in CR. If SIB1 is always acquired when a SIB is needed, changes related to issue 1 may not be needed.**Issue 2** is a different issue and is not related to CR R2-2009101 or R2-2010272.For non positioning SIB, UE try to use the stored version of required SIB if it is valid as highlighted in yellow. However for positioning SIBs, such behaviour is missing. The intention is to change the text as highlighted in green.**Modifications for only ISSUE 2 in CR:**4> if the UE has a stored valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, that the UE requires to operate within the cell in accordance with sub-clause 5.2.2.1:5> use the stored version of the required SIB;4> if the UE has not stored a valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s), in accordance with sub-clause 5.2.2.1:5> for the SI message(s) that, according to the *si-SchedulingInfo*, contain at least one required SIB and for which *si-BroadcastStatus* is set to broadcasting:6> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;5> for the SI message(s) that, according to the *si-SchedulingInfo*, contain at least one required SIB and for which *si-BroadcastStatus* is set to *notBroadcasting*:6> trigger a request to acquire the SI message(s) as defined in sub-clause 5.2.2.3.3;4> if the UE has received request from upper layers:5> if the UE has a stored valid version of a posSIB, in accordance with sub-clause 5.2.2.2.1, that the UE requires to operate within the cell in accordance with sub-clause 5.2.2.1:6> use the stored version of the required posSIB;5> else:6> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one requested posSIB and for which *posSI-BroadcastStatus* is set to *broadcasting*:7> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;6> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one requested posSIB for which *posSI-BroadcastStatus* is set to *notBroadcasting*:7> trigger a request to acquire the SI message(s) as defined in sub-clause 5.2.2.3.3a; |
| Nokia | No | The emphasis seems to be about using the most recently **stored** SIB1 but the reason for change is not crystal clear to me. If such a clarification is required for SIBs of specific service like V2X, this can be clarified as part of some V2X SIB acquisition section. The changes proposed seems too drastic and we prefer not to change SI acquisition in a major way at this time. |
| Qualcomm Incorporated | Yes partially | We see some merit in clarifying that the UE only goes acquiring posSIB if the stored version is not valid. |
| MediaTek | Partially | The logic seems correct but it contain too much changes. We have some sympathy on the intention but no sure whether this kind of restructure is necessary. |
| Apple | Yes with Issue 2 | Changes to posSIB are agreeable |
| ZTE | Yes with Issue 2 | Changes to posSIB are agreeable |

## 2.4 Clarifications for the common search space on the active BWP

[R2-2009945](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009945.zip) Clarifications for the common search space on the active BWP Ericsson CR Rel-16 38.331 16.2.0 2146 - F NR\_newRAT-Core

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| Company | Agree (Yes/No)? | Comments |
| Ericsson (Martin) | Partially | After further review, we propose the following change to the *proposed corrections in section* 5.2.2.2.:UEs in RRC\_IDLE or in RRC\_INACTIVE shall monitor for SI change indication in its own paging occasion every DRX cycle. UEs in RRC\_CONNECTED shall monitor for SI change indication in any paging occasion at least once per modification period if the UE is provided with common search space, including *pagingSearchSpace*, *searchSpaceSIB1* and *searchSpaceOtherSystemInformation*, on the active BWP to monitor paging, as specified in TS 38.213 [13], clause 13.ETWS or CMAS capable UEs in RRC\_IDLE or in RRC\_INACTIVE shall monitor for indications about PWS notification in its own paging occasion every DRX cycle. ETWS or CMAS capable UEs in RRC\_CONNECTED shall monitor for indication about PWS notification in any paging occasion at least once every *defaultPagingCycle* if the UE is provided with common search space, including *pagingSearchSpace*, *searchSpaceSIB1* and *searchSpaceOtherSystemInformation,* on the active BWP to monitor paging.For Short Message reception in a paging occasion, the UE monitors the PDCCH monitoring occasion(s) for paging as specified in TS 38.304 [20] and TS 38.213 [13].If the UE receives a Short Message, the UE shall:1> if the UE is ETWS capable or CMAS capable, the *etwsAndCmasIndication* bit of Short Message is set, and the UE is provided with *~~pagingSearchSpace~~*, *searchSpaceSIB1* and *searchSpaceOtherSystemInformation* on the active BWP or the initial BWP:2> immediately re-acquire the *SIB1*;When the UE receives a Short Message, then apparently the UE was configured with a paging search space on the active BWP. We also think that the proposed changes in section 5.2.2.3.5 are not needed, because the UE does not need a paging search space nor SIB1 search space on the active BWP to receive SI on-demand in connected mode. |
| Huawei, HiSilicon (Yinghao) | Yes, partially | We think some clarifications will be helpful because the current term „common search space“ is too generic. Agree with E// that pagingSS is not necessary since tehe UE has already received a Short message |
| Google | Yes | We also think the clarification in Ericsson's CR is helpful. For the pagingSearchSpace, we also think it is not needed since the UE already received a paging message. |
| Samsung | Yes partially | Agree with changes suggested by Ericsson above. |
| Nokia | No | All changes in this CR are nothing but an explicit mention of which search spaces are required for which purpose. We do not see these as essential changes. |
| Qualcomm Incorporated | Yes partially | We are fine after Ericsson’s clarification above. |
| MediaTek | Yes | The further change from Ericsson is also fine. |
| Apple | Partially | The changes in 5.2.2.3.5 are not needed.Fort the first two changes in 5.2.2.2 as Ericsson suggested in comments, we need to use plural form of common search space, "common search spaces, including pagingSearchSpace, searchSpaceSIB1 and searchSpaceOtherSystemInformation “ |
| ZTE | Yes | We are fine after Ericsson’s clarification above. |

# 3 Conclusion

According to the previous sections the following proposals are made:

# 4 Contact Information

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| --- | --- |
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