3GPP TSG-RAN WG2 #117-e Tdoc R2-22xxxxx

Electronic meeting, 2022-02-21 - 2022-03-03

Agenda Item: 8.21.2

Source: Ericsson

Title: [AT117-e][050][NR17TEI] Explicit Indication of SI Scheduling start position (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

# 1 Introduction

This document is to collect comments for the CR:

* [AT117-e][050][NR17TEI] Explicit Indication of SI Scheduling start position (Ericsson)

Scope: Treat R2-2203365

Intended outcome: Agreed CR.

Deadline: W1 Friday (if possible)

Please provide your comments related to the CR

[R2-2203365](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203365.zip) Explicit Indication of SI Scheduling start position [SI-SCHEDULING] Ericsson, Verizon, Softbank, Deutsche Telekom, vivo CR Rel-17 38.331 16.7.0 2953 - B TEI1

# 2 Contact Information

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
| Qualcomm Incorporated | Masato KITAZOE (mkitazoe@qti.qualcomm.com) |
| vivo | yangxiaodong5g@vivo.com |
| Samsung | June Hwang (june77.hwang@samsung.com) |
| Apple | Zhibin Wu (zhibin\_wu@apple.com) |
| Huawei, HiSilicon | Dawid Koziol (dawid.koziol@huawei.com) |
| Lenovo | Hyung-Nam Choi (hchoi5@lenovo.com) |
| OPPO | Jiangsheng Fan (fanjiangsheng@oppo.com) |
| SoftBank | Katsunari Uemura (katsunari.uemura@g.softbank.co.jp) |
| ZTE | Yuan Gao (gao.yuan66@zte.com.cn) |
| CATT | Jianxiang Li (lijianxiang@catt.cn) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# 3 Comments

**Please provide the comments on the CR here:**

|  |  |
| --- | --- |
| Company | Comments |
| Qualcomm Incorporated | The following text for *Cond FIRST-SI* is more about semantics (rather than presence condition) and should be moved to the field description.   * *If this field is absent for the subsequent SI messages, the field value is the value of the previous entry in the schedulingInfoList2 plus 1, i.e the SI messages are scheduled in consecutive SI window order (plus one) until the field is present again.* * *Rapp: As indicated by other companies the conditional presence have been removed* |
| vivo | Agree with Qualcomm. Moreover, suggest the “SI window start position” is changed to “SI window position”.  Rapp: done |
| Samsung | Agree with QC comment. |
| Apple | 1. We share the same view as Qualcomm that this needs to be moved to field description. 2. Also, regarding the same sentence, there is no real “field value” if the field is absent. So, we suggest to make the following change: If this field is absent for the subsequent SI message, the window position of the corresponding SI message is determined based on the field value of the most recent present entry in the *schedulingInfoList2* by assumingthe SI message(s) after that entry are scheduled in consecutive SI window order (plus one) until the field is present again   *Rapp: As indicated by other companies the conditional presence have been removed* |
| Huawei, HiSilicon | 1. We agree with the comment from QCM. 2. We think it is better from overhead perspective to introduce this change via nonCriticalExtension of SIB1, i.e.:   SIB1-v17xy-IEs ::= SEQUENCE {  SI-SchedulingInfo-v17xy SEQUENCE {  schedulingInfoList2-r17 SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo2-r17 OPTIONAL -– Need R  } OPTIONAL, -- Need R  nonCriticalExtension SEQUENCE {} OPTIONAL  }  Rapp: Ok   1. On the following field:   si-WindowPosition-r17 INTEGER (1..256)  We are wondering why such large values are required which wastes a lot of memory for the UE. Considering the maximum number of SI messages is 32, we think the maximum value for si-WindowPosition of 96 is enough.  Rapp: *The shortest configurable si-WindowLengh is 5 slots. With 120 kHz SCS there can be 80 slots per frame.*  *The largest possible si-Periodicity (T) is 512 frames.*  *=> 80 slots/frame \* 512 frames / 5 slots = 8192*  *If we want full flexibility, we need a value range of 0.. 8191 SI-Windows. So, 13 bits. But then would (could) one configure an si-Window of only 5 slots in FR2? Considering that there is beam-sweeping, one would have no soft-combining possibilities.*  *So, a value range of 1..256 should certainly be sufficient/ok. we have not considered for NR extension to 71GhZ. So, 256 is 8-bits whereas 96 will be 7 bits.*   1. On “-- Cond FIRST-SI” – we would prefer to make this field always present (i.e. make it non-optional). Current handling of its absence is unnecessarily complicated. 2. On the following line:   valueTag-r17 INTEGER (0..31) OPTIONAL, -- Cond SIB-TYPE  “Cond SIB-TYPE” cannot be reused here as:   * SIB6, SIB7 or SIB8 cannot be scheduled in SchedulingInfo2 anyway. * Value tag is not used for posSIBs   So we would need a code described as follows for example:  “The field is mandatory present when *sibType* is set to *type1*. Otherwise, it is absent.”   1. For sib-MappingInfo field description, posSIBs should be mentioned as well. 2. In type1 and posSibType field descriptions, do we need to mention exact types that cannot be configured? Perhaps it is OK as a placeholder/reminder, but in the end the applicable posSIB and SIB types will be anyway part of ASN.1 signalling, right?   Rapp: Thanks above comment can been taken into account |
| Lenovo | 1. We agree with Huawei’s comment #2, i.e. to limit signaling overhead schedulingInfoList2-r17 should be introduced using R17 SIB1 NCE. 2. Regarding the max value of 256 for si-WindowPosition-r17:   We did some calculations and we think the value of 256 is justified to support new SCS of 480/960kHz in the context of NR extension to 71GHz. Acc. to our calculations it covers the max configuration of 5120ms si-periodicity, 1280 slots si-WindowLength and 960 kHz SCS.   1. Regarding the UE support of this feature we suppose it is conditionally mandatory, i.e. a UE that supports the R17 SIBs and posSIBs has to support this feature. This should be clarified/confirmed.   Rapp: Thanks above comment can been taken into account |
| OPPO | We think *si-WindowPosition-r17* should be always present, handling of its absence is totally an overhead optimization and but this optimization is not so critical and make the spec complex, so prefer to not have this “-- Cond FIRST-SI”.  Rapp: Thanks above comment can been taken into account |
| SoftBank | Agree with Lenovo’s comment#3. This feature should be conditionally mandatory for the UE supporting Rel-17 SIBs. We think 38.306 may be needed for clarifying this point.  Minor suggestions: 1) use the latest version of coversheet, 2) remove 5.2.2.3.3 from the “Clauses affected:”.  Rapp: Thanks above comment can been taken into account |
| ZTE | * Agree with QC’s comment that some text for *Cond FIRST-SI* should be moved to field description and prefer the rewording from Apple. Having the *si-WindowPosition-r17* mandatory present is also fine to us. * Agree with Lenovo’s comment#3 that this field should be conditionally mandatory for UE supporting Rel-17 SIBs and onwards.   Rapp: Thanks above comment can been taken into account |
| LGE | Agree with Huawei on On “-- Cond FIRST-SI”, it is much simpler have it always present.    Agree with Lenovo’s comment#3.  Rapp: Thanks above comment can been taken into account |
| CATT | Agree with QC comment.  SIB-TypeInfo-r17 should be SIB-TypeInfo-v17xy. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# Conclusion for section 3

* All the corrections have been incorporated in new version
* As indicated preference by 4 companies *si-WindowPosition-r17* should be mandatory, the conditional presence has been removed.

# 4 Comments for Phase 2

**Please provide the comments on the CRs here:**

**TS 38.306**

|  |  |
| --- | --- |
| Company | Comments |
| Lenovo | We have uploaded an update “v2\_Len” with following comments:   * Minor changes on cover page. * We suggest to change the name of the feature to “Acquisition of SI messages with explicit SI window positions”. * We suggest to change the description of the feature to:   “It is mandatory to support acquisition of SI messages with explicit SI window positions for UEs which support the SIB types in *schedulingInfoList2* as specified in TS 38.331 [9].”  Rapporteur: Changes have been done in v3 version |
|  |  |
|  |  |
|  |  |

**TS 38.331**

|  |  |
| --- | --- |
| Company | Comments |
| Apple | In phase 1 discusison, we think only three companies (Huawei, OPPO, CATT) suggest to make “***si-WindowPosition***“ mandatory.  But we think there are some obvious benefits to keep it optional:   1. Reduce the Sib size 2. Ensure the SI message in the list are organized in the ascending order in schedulinginfolist accoedinfg to each SI’s window position   If we make this windowm position mandatory in each SI, it seems gNB can arbitray broadcasting the wndow positons of Sis in the schedulingInfoList2-r17 in a random order, e.g. ”2, 1,4, 3”. Such a flexibilty has no use in gNB side, but increase the UE side complexity (e.g. sorting).,  If we really want to make this mandatory, we suggest to add an additional requirement. ”NW SHALL provides the window positions of schedulingInfoList2-r17 in ascending order”, which is also the assumption for legacy SI/posIS schedules in NR Rel-15/16.  Rapp: Added ”The network provides *si-WindowPosition* in an ascending order.”  For the conditon ”SIB-TYPE2”, I think this conditon is depednsons on whethe a SIB is posSIB or not., maybe we can be more intuituve to just name the condition as ” SIB-TYPE-POS”  Rapp: Done |
| Lenovo | In v1 we suggest the following changes:   * Cover page: in “Clauses affected” to add clause “6.2.2”. Rapp: Done * In ASN.1 of SIB1-v17xy-IEs to add R17 NCE of si-SchedulingInfo (and not schedulingInfoList2-r17) as shown below:   SIB1-v17xy-IEs ::= SEQUENCE {  si-SchedulingInfo-v17xy SI-SchedulingInfo-v17xy OPTIONAL, -– Need R  nonCriticalExtension SEQUENCE {} OPTIONAL  }  Rapp: ok; done.   * In ASN.1 of SI-SchedulingInfo IE to add IE SI-SchedulingInfo-v17xy as shown below:   SI-SchedulingInfo-v17xy ::= SEQUENCE {  schedulingInfoList2-r17 SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo2-r17  }   * In ASN.1 of SIB-TypeInfo-v17xy to correct field name posSIBType-r17 to posSibType-r17 to be consistent with posSibType-r16. Rapp: Done * In the description of condition SIB-TYPE-POS to replace „posSIBType” by “type2”.: Rapp: Done   “The field is mandatory present if the SIB type is type1. For posSIBType it is absent.” |
| vivo | As Apple said above, only **3** companies (Huawei, OPPO, CATT) from the **11** companies have the preference to make “*si-WindowPosition*“ mandatory. The only argument from the 3 companies is the spec complexity. It is obvious that the spec change is quite small and the argument seems to be untenable. The benefit of optional “*si-WindowPosition*“ is quite obvious.  We notice that most companies really care about the overhead of SIB1, even including Huawei. The example is the place of the new introduced list “*schedulingInfoList2-r17*”. In general, the new introduced list should be put in the “SI-SchedulingInfo” since the new introduced list is really related to SI scheduling and related fields should be put together. **However, Huawei suggested the new list is introduced via nonCriticalExtension of SIB1, not in the “*SI-SchedulingInfo*”. Actually, the saved overhead is just the overhead of the extension marker "...", which is only 1 or 2 bytes. For the overhead reduction of 1 or 2 bytes, companies support the new list via nonCriticalExtension of SIB1.**  **We want to emphasize that the overhead reduction of optional “*si-WindowPosition*“ may be much more than 1 or 2 bytes.** For example, if 10 SI messages needs to be added, 10 bytes are needed for the “*si-WindowPosition*“ if the field is mandatory. However, if the field is optional, it is possible only the first “*si-WindowPosition*“ needs to be present since idle SI windows are always consecutive till the tail of certain periodicity. In such case, only 1 byte + 10 bits = 2.128 bytes are needed. If two “si-WindowPosition“ need to be present, only 2 tytes + 10 bytes = 3.128 bytes are needed.  **For SI scheduling, the whole topic is optimization, we shall tale the overhead into account also. Therefore, we strongly suggest to make “si-WindowPosition“ optional.**  Rapp: Ok, a new revision with Optional Indication has been provided. |
|  |  |

# Conclusion

In the previous sections we made the following observations:

**3 companies are opposing to the Conditional Presence of the field SI-WindowPosition and they think that mandatory presence is simpler where as some other companies have indicated the benefit and prefers to have the Option to save the SIB1 size.**

1. RAN2 to agree to have the Conditional Presence of the field SI-WindowPosition
2. The Capability CR for TS 38.306 in R2-22xxxxx is agreed.
3. The RRC CR in R2-22xxxxx is agreed.