3GPP TSG-RAN WG2 #110-e draft\_R2-200xxxx

Online, 1 – 12 June 2020

Agenda Item: 6.8.2.2

Source: Ericsson

Title: [AT110-e][605][POS] On-demand posSIBs (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This document is to kick off the following email discussion:

* [AT110-e][605][POS] On-demand posSIBs (Ericsson)

 Scope: Discuss the open issues for on-demand posSIBs:

* How many posSIBs can the UE request at a time?
* Is the request for posSIBs on SUL supported in Rel-16?
* Is T351 timer handling required also in 5.2.2.3.5 apart from 5.2.2.4.2?

 Intended outcome: Agreeable text proposal to be merged into the OdSIB running CR, in R2-2005881

 Deadline: Comments Wednesday 2020-06-03 1000 UTC; report Thursday 2020-06-04 1000 UTC

# 2 Discussion

There are some remaining questions that need to be addressed for on demand posSIB discussions.

**a) How many posSIBs can the UE request at a time?**

Companies are requested to provide their view

* Should it be configurable by NW?
* Should there be size limitation that UE may assess before sending request?
* Should there be a fixed value?

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| Company | Comments |
| Huawei, HiSilicon | For R15 on-demand SI request, a maximum of 32 SI messages can be requested at a time. For posSIB request, for IDLE/INACTIVE, the maximum number of SI message can be requested should be the same as R15. This seems already in the current running CR; For CONNECTED, the maximum number of SIB can be requested should also be a fixed value and we think can be 32 |
| CATT | We prefer to introduce a fixed value (e.g. introducing *maxOnDemandSIB* as defined in R2-2004653. But the value of *maxOnDemandSIB* (=3) in R2-2004653 is small. We need to define a bigger value, e.g. 32. |
| Intel | So far, the total number of posSIBType can be 38 for NR POS. But would be ok to stick to R15 number 32.  |
| Ericsson | 32 posSIB(s) at a time also look large value to be requested. But it does not appear of there is any right number or criteria to suggest this; so 32 could be ok. |
| vivo | It is OK to follow R15 maximum number. So 32 could be fine. |
| Samsung  | We also have the same view that 32 is ok, since there isn’t any further justification on this than the legacy number. |

1. The maximum number of posSIB(s) that UE may request is up to 32.

**b) Is the request for posSIBs on SUL supported in Rel-16?**

There were some concern on msg-1 based on demand SI request for positioning as it may increase the preamble resource load. However, it was agreed as working assumption and during RAN2#109bis it was confirmed to be supported. However, it was not clear if the support is applicable also for SUL case apart from NUL. Overall for SUL, there are more impacts such as in MAC and for positioning methods that rely on UL SRS transmission as NW may toggle between NUL and SUL by DCI.

Companies are requested to provide their view

* Support now.
* Postponed to Rel-17

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| Company | Comments |
| Huawei, HiSilicon | SUL is a basic R15 feature and should be considered as supported by default for R16 discussions. We don’t seem a motivation why it should not be supported. SUL is important since it enlarges the UL coverage of the UE, which is important for offering positioning services for UEs at the cell edge.  |
| CATT | Support now |
| Intel | Would like to understand what additional changes would be to support SUL.  |
| Ericsson | We do not have strong view. But would be good to introduce in Rel-17. |
| vivo | We should support. We already have SUL definition in current spec and there’s no proper reason we need remove them. |
| Samsung  | We support to use SUL for msg1 based SI request for positioning. There is no reason to block this. |

1. Msg-1 based on demand SI request is supported also for SUL.

**c) Is T351 timer handling required also in 5.2.2.3.5 apart from 5.2.2.4.2?**

Section 5.2.2.4.2 is where UE checks SIB1 and forwards the necessary posSIB-MappingInfo to upper layer and after that upper layer may request to obtain certain posSIBs. The UE should then check the prohibit timer and make the request accordingly. Thus, handling of T351 is specified in 5.2.2.4.2. UE should check the latest SIB1 before acquiring; hence there is further no need to specify the requirement in some other section.

Companies are requested to provide their view:

* Only 5.2.2.4.2
* Only 5.2.2.3.5
* Both

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| Company | Comments |
| Huawei, HiSilicon | A single timer is sufficient and we have the following agreement in the last meeting:* RAN2 to introduce an explicit indication within the *RRCReconfiguration* to enable/disable the on-demand SI feature in RRC\_CONNECTED. (if the UE is not allowed/network do not support, the network is responsible to deliver the SIB in some way anyway if the SIB is required).
* SIB12, SIB13, and SIB14 can be requested on-demand by UEs in RRC\_CONNECTED.
* We use a prohibit timer, per UE
* After at Pcell change the prohibit timer is reset (the common understanding is that the UE reacquires SI in the new Pcell including SIBs needed in connected, i.e. including SIBs delivered with this mechanism)
* Confirm that the UE context will not contain the UE request SIB information
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| CATT | Only 5.2.2.3.5. The similar issue is also discussed in [607][OdSIB]. We can follow the conclusions for on-demand SI in connected. |
| Intel | Follow 607. |
| Ericsson | Sounds reasonable to follow 607. |
| vivo | Follow 607 |
| Samsung  | We also have the same view that on-going OdiSIB discussion needs to be considered.  |

1. T351 timer handling is defined similar to T350.

**d) In** [R2-2005098](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005098.zip), **it is** **suggested to condense the on demand generic and on demand posSIB description in section 5.2.2.3.5 ; if companies can provide their view. Further for condense view, one has to mention requested posSIB rather than required posSIB. So, some update would be further needed if we go for condense way.**

* Condense as suggested in [R2-2005098](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005098.zip)
* Independent as it is in the original CR [R2-2004653](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004653.zip)

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| Company | Comments |
| Huawei, HiSilicon | For the below two paragraphs in 5.2.2.3.5 and 5.2.2.4.2, it is redundant to specify the same thing twice if a simple addition in the previous condition can do the work. |
| CATT | If prohibit timers for on demand SIB/posSIB request are moved to 5.2.2.3.5, we don’t need to condense. |
| Intel | We prefer the way in original CR, i.e. independent.  |
| Ericsson | We also prefer independent |
| vivo | We prefer the way in original CR, i.e. independent. |
| Samsung  | We prefer independent. And please note that R2-2005098 has typo in its cover sheet as the correction to 38.321. |

**e) In** [R2-2005098](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005098.zip) **it is** **further** **suggested to condense the on demand generic and on demand posSIB description in section 5.2.2.4.2; However this should be seperate as the timer T350 and T351 are independent so the check should be independent; if companies can provide their view.**

* Condense as suggested in [R2-2005098](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005098.zip)
* Independent as it is in the original CR [R2-2004653](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004653.zip)

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| Company | Comments |
| Huawei, HiSilicon | Same comments as above.  |
| CATT | We prefer to have separate prohibit timers for on demand generic and on demand posSIB. Thus, the check should be independent. |
| Intel | Same view as CATT. |
| Ericsson | Same view as CATT. |
| vivo | Same view as CATT. |
| Samsung  | We prefer to have separate prohibit timers and its description, i.e., independent as it is in the original. |

1. Independent check in procedure text is captured for prohibit timers description for generic and positioning in section 5.2.2.4.2 and 5.2.2.3.5.

**f) A draft CR has been provided in** [R2-2004653](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004653.zip) **taking into account previous comments received and further comments can be added here.**

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| Company | Comments |
| Huawei, HiSilicon | The following issue is covered by R2-2005099In the current spec, for positioning system information delivery, a new field is added in RRC reconfiguration. While this is not necessary because this can already be enabled by the message dedicatedSystemInformationDelivery that already supported in R15. ***Proposal1: Remove dedicatedPosSysInfoDelivery-r16 from RRCReconfiguration and the corresponding field description.***In the current spec, a new clause 6.3.1a is created for accomadating the newly added IEs for positioning system information. The name of the new clause is Positioning System Information Blocks while the IEs under the clause are not exactly “Positioning System Information Blocks”.* posSystemInformation-r16-IEs
	+ This can be moved under the RRC message system information, since the IE has not been used elsewhere.
* posSI-ScheudlingInfo
	+ This can be moved under 6.3.2, similar to the R15 SI-ScheudlingInfo
* SIBpos
	+ This is the only one out of the three IEs are are positonning system. There is no need to create a clause for one IE. Hence, it can be moved to 6.3.1

***Proposal2: Move PosSystemInformation-r16-IEs to 6.2.2 message definitions under the message systemInformation******Proposal3: Move posSI-SchdulingInfo to 6.3.2******Proposal4: Move SIBpos to 6.3.1 system information blocks*** |
| Ericsson | We can discuss this further. |
| vivo | We prefer separate. |
| Samsung  | We prefer separate. |

1. RAN2 to discuss if dedicatedPosSysInfoDelivery-r16 is required or legacy dedicatedSystemInformationDelivery can be reused.
2. Currently Positioning IEs are grouped together in section 6.3.1a, RAN2 to discuss if restructing of the section is needed.
* Move posSI-SchdulingInfo to 6.3.2
* Move SIBpos to 6.3.1 system information blocks

**The below sections are just for reference.**

## 2.2 Comment on the on-demand SI(B) framework for positioning

A draft CR has been provided taking into account previous comments received from R2-2004209 in section 2.3. Companies are requested to provide further input in section 2.2 by checking the draft CR.

According to this, companies are kindly requested to provide comment on the DraftCR for what concern the on-demand SI(B) only for what concern positioning.

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| On-demand SI(B) feature for positioning |
| Company | Comments |
| CATT | 5.2.2.2.1 SIB validityThe UE shall apply the SI acquisition procedure as defined in clause 5.2.2.3 upon cell selection (e.g. upon power on), …; and whenever the UE does not have a valid version of a stored or required SIB or posSIB.**Comment#1:** As the description, “the UE has not stored a valid version of a posSIB”, has already been deleted, there is no behavior for the UE to trigger SI acquisition procedure due to an invalid version of a posSIB. So, ‘or posSIB’ can be deleted.Ericsson: One suggestion: as it sees we need based upon comment 2:; and whenever the UE does not have a valid version of a stored SIB or posSIB or a valid version of a required SIB.Comment 2 is: 1>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 **or posSIB**, in accordance with sub-clause 5.2.2.2.1,5.2.2.3.1 Acquisition of *MIB* and *SIB1*1>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 **Comment#2:** Based on the above description, if the UE can receive SIB1 and SI via broadcast with the active BWP, the UE needs to acquire the latest SIB1 before to acquire required SIB(s) to obtain the latest broadcast status. The similar procedure is needed for acquisition of required posSIB(s) requested by upper layer. Suggest to update as below:1>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 or posSIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s) or posSIB(s), in accordance with sub-clause 5.2.2.1, and, UE has not acquired SIB1 in current modification period; or Ericsson: ok for stored posSIB; however for required posSIB; there is a comment from MTK below:* In section 5.2.2.4.2, the posSIB requirements talk about „required posSIB(s), in accordance with sub-clause 5.2.2.1“, but there are no posSIB requirements in 5.2.2.1; it’s not actually clear that there should be any requirements on acquiring posSIBs in response to receiving SIB1, as opposed to in response to receiving a positioning request from upper layers.

1>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 or posSIB, 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; or5.2.2.3.5 Request for on demand system information in RRC\_CONNECTED1> if the UE is in RRC\_CONNECTED with an active BWP not configured with common search space with the field *searchSpaceOtherSystemInformation* 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 or if requested by upper layers:2> for the SI message(s) that, according to the *si-SchedulingInfo* or *posSI-SchedulingInfo* in the stored SIB1, contain at least one required SIB or posSIB:3> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;**Comment#3:** Ericsson: Regarding comment #11 and #12, we assume that since the check is done before to enter in the section where the on-demand request is actually sent, there should not be any issue. However, this is more a matter of taste and good to check companies understanding.Feedback to Ericsson’s comment:If requested by upper layers for positioning the UE is in RRC\_CONNECTED with an active BWP while not configured with common search space with the field *searchSpaceOtherSystemInformation,* the UE will execute 5.2.2.3.5 directly with the above behavior. And in this case, the UE needs to check whether the corresponding prohibit timer for transmission of on demand SIB request is running. Hence, we propose to move the judgement of timer T351 from 5.2.2.4.2 to 5.2.2.3.5.Ericsson: Ok, we will check and come back on this.Ericsson: Since to align with on demand generic framework text we can leave it as it is. |
| Apple | 5.2.2.4.2 Actions upon reception of the *SIB1*Upon receiving the *SIB1* the UE shall:1> store the acquired *SIB1*;1> forward the received *posSIB-MappingInfo* to upper layers;Comment:For the posSIB-MappingInfo, it is received in SIB only if PosSI-SchedulingInfo is included in SIB, so it is better to add a condition “if PosSI-SchedulingInfo is include in SIB1” before the sentence “forward the received *posSIB-MappingInfo* to upper layers”.Ericsson: Ok. 1> forward the received *posSIB-MappingInfo* to upper layers, if included; |
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## 2.3 Previous Comments for Tracking (from R2-2004209)

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| On-demand SI(B) feature for positioning |
| Company | Comments |
| CATT | 5.2.1 IntroductionNOTE: The physical layer imposes...**Comment#1:** The format of Note above looks wrong. Please check it.Ericsson: Ok; yes it should be ok now.5.2.2.2.1 SIB validitya valid version of a stored or required SIB or posSIB**Comment#2:** We need to clarify where the posSIB validity is during the online meeting. Is it in upper layer or in RRC? The posSIB validity in LTE is located in upper layer.Ericsson: The value tag for posSIB is optionally provided in LPP signalling [49].The above is already in RRC text.5.2.2.3.3 Request for on demand system information**Comment#3:** The title can be updated as “Request for on demand system information in RRC\_IDLE/RRC\_INACTIVE, similar to 5.2.2.3.5 Request for on demand system information in RRC\_CONNECTED.Ericsson: Ok; this is legacy text/header; not sure if we can update it. We are as such not allowed to change that.5.2.2.3.3a Request for on demand Positioning system information**Comment#4:** The title can be added with “in RRC\_IDLE/RRC\_INACTIVE”. The same reason as above.Ericsson: We can change this but then it won’t be aligned with legay title.5.2.2.3.3a Request for on demand Positioning system information2> initiate transmission of the *RRCSystemInfoRequest* message for positioning in accordance with 5.2.2.3.4a;**Comment#5:** Typo. 5.2.2.3.4a should be 5.2.2.3.4.Ericsson: thanks corrected.5.2.2.3.5 Request for on demand system information in RRC\_CONNECTED3> acquire the requested SI message(s) corresponding to the requested SIB(s) as defined in sub-clause 5.2.2.3.2.**Comment#6:** This part “3>...” can be replaced as3> acquire the requested SI message(s) corresponding to receive RRCReconfiguration meesage. Because it can be aligned with the modification in 5.3.5.3.Ericsson: This comment should be for general on demand and not for positioning specific.5.2.2.3.5 Request for on demand system information in RRC\_CONNECTED2> for the SI message(s) that, according to the *posSI-SchedulingInfo* in the stored SIB1, contain at least one required SIB and for which *posSI-BroadcastStatus* is set to *notBroadcasting*:3> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;**Comment#7:** The action 4 as below was missed here which should follow the same procedure of “*si-BroadcastStatus* is set to *notBroadcasting*”. 4> acquire the requested SI message(s) corresponding to the requested SIB(s) as defined in sub-clause 5.2.2.3.2.**Ericsson: Thanks done.**5.2.2.4.2 Actions upon reception of the *SIB1*Upon receiving the *SIB1* the UE shall:1> store the acquired *SIB1*;**Comment#8:** The action as below should be added because upper layer should send the on demand request based on *PosSI-SchedulingInfo* in SIB1.1> Send the received *PosSI-SchedulingInfo* to upper layer.Ericsson: It is RRC layer which should send the on demand request right. Anyhow, I agree the above addition is needed. Good suggestion. Thanks.5.2.2.4.2 Actions upon reception of the *SIB1*3> if the UE has not stored a valid version of a posSIB:**Comment#9:** We need to clarify where the posSIB validity is first. The posSIB validity in LTE is located in upper layer. If the validity is made in upper layer, “3> ...” should be updated as “received request from higher layer”.Ericsson: as commented above posSIB validity is in LPP. In that view agree that received request from higher layer is correct.**Comment#10**: “3> ... set to *broadcasting*:” was missed between “3> if...” and “4> acquire...” shown as below:3> if the UE has not stored a valid version of a posSIB:3> for the SI message(s) that, according to the pos*SI-SchedulingInfo*, contain at least one required posSIB and for which *posSI-BroadcastStatus* is set to *broadcasting*:4> acquire the SI message(s) corresponding to the requested posSIB(s) as defined in sub-clause 5.2.2.3.2;**Comment#11:** The judgment of timer T351 can be moved to 5.2.2.3.5, because 5.2.2.3.5 also need evaluate the timer T351. When there is a upper layer request, UE can step into 5.2.2.3.5 directly without following 5.2.2.4.2.3> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one required posSIB and for which *posSI-BroadcastStatus* is set to *notBroadcasting* and timer T351 is not running:4> start or restart timer T351 with the timer value set to the *onDemandPosSIBRequestProhibitTimer*;4> trigger a request to acquire the required posSIB(s) as defined in sub-clause 5.2.2.3.5;5.2.2.4.2 Actions upon reception of the *SIB1*2> else if the UE has an active BWP not configured with common search space configured with the field *searchSpaceOtherSystemInformation* 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 or according to the request from upper layers:3> if *onDemandSibRequest* is set to *true* and timer T350 is not running:4> start or restart timer T350 with the timer value set to the *onDemandSIBRequestProhibitTimer*;4> trigger a request to acquire the required SIB(s) as defined in sub-clause 5.2.2.3.5;**Comment#12:** Positioning part was missed here. Again, we suggest to move T351 timer judgment into 5.2.2.3.5 as comment #11.– *RRCSystemInfoRequest**RRCSystemInfoRequest message*RRC-PosSystemInfoRequest-IEs-r16 ::= SEQUENCE { requested-PosSI-List BIT STRING (SIZE (maxSI-Message)), --32bits spare BIT STRING (SIZE (12))}Ericsson: Regarding comment #11 and #12, we assume that since the check is done before to enter in the section where the on-demand request is actually sent, there should not be any issue. However, this is more a matter of taste and good to check companies understanding.**Comment#13:** size in “spare BIT STRING (SIZE (12))” should “11” because the choice is added as below.criticalExtensionsFuture-r16 CHOICE { rrcPosSystemInfoRequest-r16 RRC-PosSystemInfoRequest-IEs-r16, criticalExtensionsFuture SEQUENCE {} }Ericsson: Comment 13: Done ThanksB.1 Protection of RRC messages*RRCSystemInfoRequest* + + + Justification for A-I and A-C: the message can be sent in SRB0 in RRC\_INACTIVE state, after the AS security is activated.**Comment#14:** There is no need to add it.Ericsson: Right; it already exists. |
| MediaTek | 1. In section 5.2.2.4.2, the requirements in case T351 is not running include „start or restart timer T351“. We can’t restart it if it’s not running, so the highlighted part seems spurious.Ericsson: Agree that this is a bit strange. We just aligned the text to that one that is already present for other prohibit timers. However, if the handling is clear we can also delete the highlighted part.2. Section 5.2.2.4.2, typos: „uppler layers“ should be „upper layers“, and „acquisiotion“ should be „acquisition“. Also missing italics on „broadcasting“ in the next-to-last level 4 bullet.Ericsson: Will fix these when providing an update on the CR3. The definition of the IE PosSIB-ReqInfo is missing ::=, and missing the „r“ in its -r16 suffix.4. The field name onDemandPosSIBRequestProhibitTimer needs a hyphen: onDemandPosSIB-RequestProhibitTimer5. dedicatedPosSysInfoDelivery-r16 should probably be Need N, similar to the existing dedicatedSystemInformationDelivery.6. onDemandPosSibRequestConfig is missing from the field description table for RRCReconfiguration.7. In section 5.2.2.3.3a, there is a case of referring to „RRCPosSystemInfoRequest message“, instead of „RRCSystemInfoRequest for positioning“ (last level 2 bullet).Ericsson: Will fix 3,4,5,6,7 when providing an update on the CR8. Section 5.3.5.3 says:1> if the *RRCReconfiguration* message includes the *dedicatedPosSysInfoDelivery*:2> perform the action upon reception of System Information as specified in 5.2.2.4;This isn’t quite right, because dedicatedPosSysInfoDelivery doesn’t contain a SystemInformation message but a lower-level IE (PosSystemInformation-r16-IEs). We might instead say „perform the actions upon reception of the contained posSIB(s), as specified in sub-clause 5.2.2.4.16“. However, this is kind of a theoretical detail, because anyway there are no requirements in 5.2.2.4.16...Ericsson: Agree there is some missing piece here. Good to discuss how to handle it.Ericsson: this has been corrected.9. In RRCReconfiguration-v16xy-IEs, onDemandPosSibRequestConfig-r16 should be onDemandPosSIB-RequestConfig-r16 („SIB“ is an acronym).Ericsson: Will fix this when providing an update on the CR10. In OnDemandPosSibRequest-r16, the larger values of onDemandPosSIBRequestProhibitTimer seem excessive. This could cause multiple positioning operations to fail because the prohibit timer is still running from the first operation.Ericsson: Values for the prohibit timer are just indicative. However, we agree that very larger values doe not make sense in this case.11. onDemandPosSIBRequestProhibitTimer needs a hyphen: onDemandPosSIB-RequestProhibitTimer.12. In RRC-PosSystemInfoRequest-IEs-r16, requested-PosSI-List should not have the first hyphen: requestedPosSI-List („requested“ is not an acronym). (It’s wrong in the legacy RRCSystemInfoRequest-IEs too.)Ericsson: Will fix this when providing an update on the CR |
| Nokia | 5.2.2.2.1: Why mention "required SIB/posSIB" here. 5.2.2.3 describes acquisition of all SIB/posSIB including the required SIB/posSIB. Don't see a need to highlight required SIB/posSIB here.Ericsson: Not strong view on it. We can delete this text is there are no complains by other companies.5.2.2.3.2: Change to SIB1 in the following:3> determine the number *m* which corresponds to the number of SI messages with an associated *si-Periodicity* of 8 radio frames (80 ms), configured by *schedulingInfoList* in *SystemInformationBlockType1*;Ericsson: thanks done.5.2.2.3.3a: Change Positioning to lower case in the section headingEricsson: thanks done.5.2.2.3.3a: Change references of “UE requires to operate within the cell” in the positioning case to “UE upper layers requires for positioning operations”Ericsson: thanks done.5.2.2.3.3a: Change “initiate transmission of the RRCSystemInfoRequest message for positioning in accordance with 5.2.2.3.4” To: “initiate transmission of the *RRCSystemInfoRequest* message including *rrcPosSystemInfoRequest* in accordance with 5.2.2.3.4”Ericsson: thanks done.5.2.2.3.3a: In “2> if SI request is based on RRCPosSystemInfoRequest message:” message name is incorrect. May be the text should be “if the *RRCSystemInfoRequest* message was sent including *rrcPosSystemInfoRequest*”Ericsson: We will correct all the above in the next update of the CR.5.2.2.3.4: UE should execute the steps in this section conditionally based on whether SIB or posSIB is required. Right now, it executes both steps for both SIB and posSIB requests.Ericsson: We agree with the changes and in our initial version of the draftCR submitted in 6.21 this was implemented. Will fix in the next update of the draftCR.5.2.2.3.5: Change “or according to the request from upper layers” To: “or if requested by upper layers”5.2.2.3.5: In this section there are mentions of “stored SIB1”. Why mention “stored”. UE is free to check stored SIB1 if it has but the text should be mentioning just SIB1Ericsson: We think current text is correct since the UE cannot request the SIB while in CONNECTED if it does not have a stored/received SIB1. Without receiving SIB1 there is no on-demand request in CONNECTED (the SIB1 should also be valid).5.2.2.4.2: “forward the received PosSI -SchedulingInfo to upper layers”. PosSI -SchedulingInfo should be lower case but I don’t think this should be forwarded to upper layers. This is a info from SIB1 used by RRC layer. It is up to inter-layer interactions, which is up to implementation, to forward relevant positioning assistance data. At most just the PosSIB-MappingInfo (PosSibType, GNSS ID, SBAS ID etc) is what can be forwarded to upper layers.Ericsson: Good to further discuss this issue. Ericsson: It has been corrected. forward the received posSIB-mapping5.2.2.4.2: Change “if onDemandSibRequest is set to true” To: “if UE is configured with *onDemandSibRequestConfig* and *onDemandSibRequest* is set to true”Ericsson: We will correct all the above in the next update of the CR.5.2.2.4.2: “3> if the UE has received request from higher layer:”. Change higher layer to upper layersEricsson: We will correct all the above in the next update of the CR.Ericsson: corrected6.2.2, DedicatedSIBRequest message: Field description of requestedSIB-List: change to “requested by the UE while in while in RRC\_CONNECTED”Field description of requestedPosSIB-List: change to “Contains a list of posSIB(s) requested by the UE while in RRC\_CONNECTED. See TS 37.355 [49]”Ericsson: We will correct all the above in the next update of the CR.6.2.2, RRCReconfiguration message: onDemandSIBRequest in OnDemandSibRequest-r16 is close in name to parent IE. Rename one of them.Ericsson: We have other example where this convention has been used. If majority view it to change it, we are ok to do it.6.3.1a: Description missing for PosSI-SchedulingInfo IEEricsson: We will correct all the above in the next update of the CR.6.3.1a: Confusing to read with two IEs close in name. PosSI-SchedulingInfo and PosSchedulingInfo. Rename PosSchedulingInfoEricsson: We have other example where this convention has been used. If majority view it to change it, we are ok to do it.6.3.1a: Type is defined as Pos-SchedulingInfo-r16 but it is referenced as PosSchedulingInfo6.3.1a: posSI-BroadcastStatus is missing -r16 suffix6.3.1a: In the conditional presence description for MSG-1 a space is missing after Need REricsson: We will correct all the above in the next update of the CR.6.3.2: si-RequestResources in SI-RequestConfig: Since the concatenated SI message list is doubled due to positioning, is maxSI-Message number of resources enough resources? Should we define a separate si-RequestConfig-r16?6.3.2: Since SI-RequestConfig is used by positioning also, it should be moved out to be a common IE?Ericsson: Good to clarify the two comment above during the online session.Ericsson: maxSI-Message is 32; that is the maximum allowed. So, that should be ok.6.3.2: Since SI-RequestConfig is used by positioning also, it should be moved out to be a common IE?Yes agree on the restructuring. Done in recent version.6.3.2: si-RequestResources: Description needs update to apply for positioning also. Right now it only references si-BroadcastStatusEricsson: We will correct all the above in the next update of the CR. |
| ZTE | 1. It is not clear to us why we have separate indications showing allowance of on demand SI request in connected for SIB and posSIB: onDemandPosSibRequestConfig-r16 & onDemandSibRequestConfig-r16. And why we have separate timer (T350 and T351)? Did we make any agreement about that. In our understanding, one common indication and timer will be sufficient.

Ericsson: It is of course possible to use a single field in the RRC message for both general procedure and posSIB. However, please not that SIB and posSIB are difference as also the fields and messages used for requesting them on-demand. For this reason, we believe that is a cleaner to have them separated also here. Regarding the timer, we agreed that the on-demand SIB request RRC message used will have a prohibit timer and since, this same message is used for positioning, it is a natural consequence to have a prohibit timer for both the normal and positioning on-demand procedure. On top of this, the handling and request of posSIB could be difference from legacy SIBs and thus it does make sense to have two difference timers.1. We do not think the *dedicatedPosSysInfoDelivery-r16* field is needed in *RRCReconfiguration* message. The positioning system Information blocks are still conveyed to UE via *SystemInformation* message. The existing *dedicatedSystemInformationDelivery* field (copied below) is sufficient to covey the positioning SIBs to UE.

dedicatedSystemInformationDelivery OCTET STRING (CONTAINING SystemInformation) OPTIONAL, -- Need N1. It is not clear to us why the *rrcPosSystemInfoRequest-r16* is introduced in *RRCSystemInfoRequest* message because the positioning system Information blocks are still conveyed to UE via *SystemInformation* message and the SI request in idle and inactive state is made per SI message. There is no need to change the ASN.1. The field description for *requested-SI-List* can be updated to cover the positioning SIBs.

Ericsson: We believe that this is more a matter of implementation on how the SIBs and posSIBs are delivered tot he UE. However, good to discuss this online.Ericsson: This is RAN2 decision already to have seperate or extention.Msg1-based SI request mechanism should be extended to support posSIBs request. We need a separate procedure for positioning (separate procedure exist in procedure section) and then clean solution ASN.1 wise would be to not merge with existing. |
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## ANNEX Previous comments from Part 1

### A.1 Introduction of on-demand SIB in CONNECTED with positioning ([R2-2003787](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003787))

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| Company | Comments |
| MediaTek | We find a few detailed issues with this CR as follows:* Section 5.2.2.3.3a refers to RRCPosSystemInfoRequest as if it were a separate message, which it isn’t (it’s a critical extension of RRCSystemInfoRequest). So this section should talk about initiating transmission of the RRCSystemInfoRequest for positioning, rather than initiating transmission of the RRCPosSystemInfoRequest „message“.
* Similarly, section 5.2.2.3.4a should be merged into section 5.2.2.3.4.
* Section 5.2.2.3.6 has a grammatical problem: It should say „include requestedSIB-List in the onDemandSIB-RequestList to indicate the requested SIB(s)“ (and mutatis mutandis for posSIBs).
* In section 5.2.2.4.2, the posSIB requirements talk about „required posSIB(s), in accordance with sub-clause 5.2.2.1“, but there are no posSIB requirements in 5.2.2.1; it’s not actually clear that there should be any requirements on acquiring posSIBs in response to receiving SIB1, as opposed to in response to receiving a positioning request from upper layers.
* In the field description table for the message DedicatedSIBRequest, the description for requested-posSIB-List is missing its field name.
* Per the ASN.1 conventions, the field name should be requestedPosSIB-List (without the first hyphen).
* In RRCReconfiguration-v1600-IEs, the OCTET STRING should just contain SystemInformation; there is no PosSystemInformation message.
* In PosSI-SchedulingInfo, the conditional MSG-1 is not defined (should be cloned from SI-SchedulingInfo).
* In PosSI-SchedulingInfo, it seems wrong for posSI-BroadcastStatus to be OPTIONAL. What does it mean for it to be absent? This field is mandatory in SchedulingInfo for regular SI.
 |
| Nokia | The instructions for this email discussion says “Treat papers under 6.21, by treating R2-2003204, R2-2003203 and taking into account comments”. Why is this R2-2003787 and ASN.1 class 2 issues (section 2.4) part of this email discussion? The background on R2-2003787 is not described this discussion document and the CR cover for R2-2003787 is not clear as to which Tdoc containing the last agreed running CR for OSI for positioning was used to implement on top of 38.331 v16.0.0. |
| Samsung | We need more time to look into the details of the positioning CR but some general comments. We noticed procedural text is duplicated for the positioning aspects which makes the bulky. Since the functionality is similar for OSI request from IDLE/INACTIVE (i.e. SI message level) while for connected OSI request for regular SIBs is on SIB level while for positioning it is SI message level. Apart from this all the functionality in terms of info in SIB1 for regular SIBs is duplicated for positioning SIBs. With this background it would be desirable to merge procedural text if possible. We will provide details comments on the CR later.  |
| Huawei,HiSilicon | We prefer tdoc R2-2003637 to be the baseline for introducing on-demand SI in CONNECTED mode for positioning, because this CR includes quite a lot of corrections that are not only applicable for OdSIB in connected for positioning, but also for the general OdSIB procedures |
| Lenovo | After first review the following issues were spotted:* Cover page: WI code “NR\_unlic-Core” can be removed. My understanding is that OSI in connected does not need to be supported for NR-U.
* 5.2.2.3.3a (Request for on demand Positioning system information): shouldn’t SI request in RRC IDLE/INACTIVE supported on supplementary uplink as well?
* Constant “maxPosSIB-Message” is not defined in 6.4. Furthermore, it may be better renamed to “maxPosSIB”.
* We have not agreed yet to support SIB12, SIB13, SIB14, and SIB10 may need to be supported as well, see my comment to the feature summary document.
* RRCPosSystemInfoRequest is missing in the table in B.1.
 |
| CATT | 5.2.2.3.3a Request for on demand Positioning system information2> if acknowledgement for *RRCPosSystemInfoRequest* IE~~message~~ is received from lower layers:Comments #1: “Message” should be changed into “IE” because RRCPosSystemInfoRequest is not a message.5.2.2.3.5 Request for on demand system information in RRC\_CONNECTEDThe UE shall:1. if the UE is in RRC\_CONNECTED with an active BWP not configured with common search space configured with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB or the UE has received a positioning request from higher layer,

Comments #2: Added positioning request from higher layer condition.5.2.2.4.2 Actions upon reception of the *SIB1*3> if the UE has not stored a valid version of a posSIB, in accordance with sub-clause 5.2.2.2.1, of one or several required posSIB(s), in accordance with sub-clause 5.2.2.1:Comments #3: The validity of posSIB is not mentioned in 5.2.2.2.1 while there is no posSIB validity. We share the same view of MTK’s. |
| ZTE | Agree with Nokia this CR is a little bit out of the scope of this email discussion but we are also interested in it. We would like to have more time to check all the details inside. |

## A.2 ASN.1 class 2 Review issues

According to the agenda item 6.0.1, the following RILs have been added concerning the on-demand SIB procedure (i.e., including positioning).

On-demand SI in Connected

[R2-2003634](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_109bis-e/Docs/R2-2003634.zip) [H207][H208][H209][H211][H218] DraftCR for on-demand SI request for positioning in RRC\_CONNECTED Huawei, HiSilicon draftCR Rel-16 38.331 16.0.0 NR\_pos-Core Late

[R2-2003635](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_109bis-e/Docs/R2-2003635.zip) [H221] DraftCR for DedicatedSIB-Request Huawei, HiSilicon draftCR Rel-16 38.331 16.0.0 NR\_pos-Core Late

[R2-2003636](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_109bis-e/Docs/R2-2003636.zip) [H215][H216][H217][H219] DraftCR for Actions upon reception of the SIB1 Huawei, HiSilicon draftCR Rel-16 38.331 16.0.0 NR\_pos-Core Late

[R2-2003637](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_109bis-e/Docs/R2-2003637.zip) [H222] DraftCR for on-demand SI request for positioning in RRC\_CONNECTED Huawei, HiSilicon draftCR Rel-16 38.331 16.0.0 NR\_pos-Core Late

For what concern these contributions, the tdocs R2-2003634, R2-2003635, and R2-2003636 have been already addressed in the latest version of the Draft CR that has been submitted in this meeting (i.e., in R2-2003787). However, companies may provide additional comments on this three CRs.

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| R2-2003634, R2-2003635, and R2-2003636 |
| Company | Tdoc | Comments |
| Samsung | R2-2003634 | The below text in 5.2.2.3.5 need to be restored:2> for the SI message(s) that, according to the *si-SchedulingInfo* in the stored SIB1, contain at least one required SIB and for which *si-BroadcastStatus* is set to *Broadcasting*:3> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2; |
| Samsung | R2-2002626 | The cross-referencing of the subclauses is not correct. See below yellow highlight:2> else if the UE has an active BWP configured with common search space configured by *SearchSpaceOtherSystemInformation* 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 5.2.2.1:3> 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*:4> acquire the SI message(s) corresponding to the requested SIB(s) as defined in sub-clause 5.2.2.3.2;3> 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*:4> trigger a request to acquire the required SIB(s) as defined in sub-clause 5.2.2.3.5; |
| Lenovo | R2-2003635 | The list of supported Rel-16 SIBs is not complete as SIB10 (HRNN) for NPN should be supported as well.The values of SIB-ReqInfo-16 can be simplified by “sib10”, “sib11” etc. Furthermore, we need to discuss whether to add extension marker in the ENUMERATED type. In general, extension markers should be added when otherwise extension is cumbersome. |
| Intel | R2-2003634 | Once the revision marks are gone in the final specs, the following is a bit difficult to read:“with an active BWP not configured with common search space configured with the field *searchSpaceOtherSystemInformation*”Can it be simplified for example as:“if the active BWP does not have a common search space configured by *searchSpaceOtherSystemInformation*” |
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For the tdoc R2-2003637, instead, a further checking is needed since this Draft CR it was not implemented on top of the CR that I provided. Therefore, we would like to ask company to double check this contribution and provide comment on what should be implemented with respect to the Draft CR currently submitted in R2-2003787.

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| R2-2003637 |
| Company | Comments |
| MediaTek | Adding „request from higher layer for posSIB“ to section 5.2.2.3.5 seems needed, and we slightly prefer this tdoc’s construction of section 5.2.2.3.6, as the version of 5.2.2.3.6 in R2-2003787 could be read to suggest that the procedure is either for SIBs or posSIBs (not both). |
| Samsung | We prefer the general approach suggested in the draft CR to implement the procedural text related to positioning OSI i.e. our earlier comment on the rapporteur CR was to avoid duplicate sub clauses and consider the approach in this draft CR |
| Huawei | Same view as MTK and SS |
| CATT | We think R2-2003637 on demand SI for positioning in Connected mode looks good in principle.The text proposal in R2-2003637 can be merged into R2-2003787. |
| Intel | Agree with others that this draft CR R2-2003637 captures well the positioning SIBs handling. |
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# Conclusion

A draft CR has been provided which is based upon the comments and discussions listed in above document.

There are few outstanding issues that we need to discuss online.

a) How many posSIBs UE may request at a time?

b) Is SUL supported for positioning purpose in Rel-16?

c) Is T351 timer handling required also in 5.2.2.3.5 apart from 5.2.2.4.2

Based on the discussion in section 2 we observe and propose the following:

Proposal 1 The maximum number of posSIB(s) that UE may request is up to 32.

Proposal 2 Msg-1 based on demand SI request is supported also for SUL.

Proposal 3 T351 timer handling is defined similar to T350.

Proposal 4 Independent check in procedure text is captured for prohibit timers description for generic and positioning in section 5.2.2.4.2 and 5.2.2.3.5.

Proposal 5 RAN2 to discuss if dedicatedPosSysInfoDelivery-r16 is required or legacy dedicatedSystemInformationDelivery can be reused.

Proposal 6 Currently Positioning IEs are grouped together in section 6.3.1a, RAN2 to discuss if restructing of the section is needed.

 Move posSI-SchdulingInfo to 6.3.2

 Move SIBpos to 6.3.1 system information blocks

# References

[1] R2-2003876- Introduction of on-demand SIB