**3GPP TSG- Meeting # *11033***

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **5107** | **rev** | **1** | **Current version:** | **17.10.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | Correction of maxSI messages [SI-SCHEDULING] |
|  |  |
| ***Source to WG:*** | Xiaomi |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2024-11-20 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | RRC specification states that the maximum SI message that can be delivered is 32 by the constant defined as maxSI-Message = 32.When an on-demand SI feature is implemented, the maxSI present is still 32.With on-demand feature, an SI may have a tag broadcasting or notBroadcasting and the tag can be toggled. However, the total number of SIs that is availabe for the NW to schedule or for the UE to request remains same (i.e 32), as the maximum number of bits for *requested-SI-List* of on-demand SI request message (i.e. *RRCSystemInfoRequest*) is 32, with each bit corresponding to a SI message regardless of the broadcast status (i.e. including both broadcasting and notBroadcasting)The current field description of *si-BroadcastStatus* is ambigous since it says “Indicates if the SI message is being broadcasted or not.” However, later it puts a constraint for *maxSI-Message* with respect to only *notBraodcasting*. “If *si-SchedulingInfo-v1700* is present, the network ensures that the total number of SI messages with *posSI-BroadcastStatus*and *si-BroadcastStatus*set to *notBroadcasting* in the concatenataed list of SI messages configured by *schedulingInfoList* in *si-SchedulingInfo* and SI messages containing type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700* does not exceed the limit of *maxSI-Message* when *posSI-RequestConfig* or *posSI-RequestConfigRedCap* or *posSI-RequestConfigSUL* is configured.”It does not cover that this is an on-demand mechanism and a SI that is marked as *notBroadcasting* can also be toggled however the list remains the same and the UE should ensure that only the SIs that are not being broadcast should be requested.  |
|  |  |
| ***Summary of change:*** | Remove the restriction on the *maxSI-message* in the field description of *si- BroadcastStatus* and *posSI-BroadcastStatus*.Add new field descriptions of ***schedulingInfoList, schedulingInfoList2-r17*** and ***posSchedulingInfoList*** to clarifiy that the the total number of SI messages in the list of concatenated SI messages remains 32 (i.e. maxSI-Message)**Impact analysis****Impacted 5G architecture options:**NR-SA**Impacted functionality:**On-demand SI request, MaxSI-Message**Inter-operability:**If the UE is implemented according to the CR while the network is not; there may be ambiguity that the NW should support transmission of more than 32 SI messages. |
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| ***Consequences if not approved:*** | Confusion with regards to maxSI-message |
|  |  |
| ***Clauses affected:*** | 6.3.1a, 6.3.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*Beginning of Changes (change1)*

### 6.3.1a Positioning System information blocks

#### – *PosSystemInformation-r16-IEs*

*<Skip umodified changes>*

– *PosSI-SchedulingInfo*

-- ASN1START

-- TAG-POSSI-SCHEDULINGINFO-START

PosSI-SchedulingInfo-r16 ::= SEQUENCE {

 posSchedulingInfoList-r16 SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r16,

 posSI-RequestConfig-r16 SI-RequestConfig OPTIONAL, -- Cond MSG-1

 posSI-RequestConfigSUL-r16 SI-RequestConfig OPTIONAL, -- Cond SUL-MSG-1

 ...,

 [[

 posSI-RequestConfigRedCap-r17 SI-RequestConfig OPTIONAL -- Cond REDCAP-MSG-1

 ]]

}

PosSchedulingInfo-r16 ::= SEQUENCE {

 offsetToSI-Used-r16 ENUMERATED {true} OPTIONAL, -- Need R

 posSI-Periodicity-r16 ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

 posSI-BroadcastStatus-r16 ENUMERATED {broadcasting, notBroadcasting},

 posSIB-MappingInfo-r16 PosSIB-MappingInfo-r16,

 ...

}

PosSIB-MappingInfo-r16 ::= SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16

PosSIB-Type-r16 ::= SEQUENCE {

 encrypted-r16 ENUMERATED { true } OPTIONAL, -- Need R

 gnss-id-r16 GNSS-ID-r16 OPTIONAL, -- Need R

 sbas-id-r16 SBAS-ID-r16 OPTIONAL, -- Cond GNSS-ID-SBAS

 posSibType-r16 ENUMERATED { posSibType1-1, posSibType1-2, posSibType1-3, posSibType1-4, posSibType1-5, posSibType1-6,

 posSibType1-7, posSibType1-8, posSibType2-1, posSibType2-2, posSibType2-3, posSibType2-4,

 posSibType2-5, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9, posSibType2-10,

 posSibType2-11, posSibType2-12, posSibType2-13, posSibType2-14, posSibType2-15,

 posSibType2-16, posSibType2-17, posSibType2-18, posSibType2-19, posSibType2-20,

 posSibType2-21, posSibType2-22, posSibType2-23, posSibType3-1, posSibType4-1,

 posSibType5-1,posSibType6-1, posSibType6-2, posSibType6-3,... },

 areaScope-r16 ENUMERATED {true} OPTIONAL -- Need S

}

GNSS-ID-r16 ::= SEQUENCE {

 gnss-id-r16 ENUMERATED{gps, sbas, qzss, galileo, glonass, bds, ..., navic-v1760},

 ...

}

SBAS-ID-r16 ::= SEQUENCE {

 sbas-id-r16 ENUMERATED { waas, egnos, msas, gagan, ...},

 ...

}

-- TAG-POSSI-SCHEDULINGINFO-STOP

-- ASN1STOP

|  |
| --- |
| ***PosSI-SchedulingInfo* field descriptions** |
| ***areaScope***Indicates that a posSIB is area specific. If the field is absent, the posSIB is cell specific. |
| ***encrypted***The presence of this field indicates that the *pos-sib-type* is encrypted as specified in TS 37.355 [49]. |
| ***gnss-id***The presence of this field indicates that the positioning SIB type is for a specific GNSS. Indicates a specific GNSS (see also TS 37.355 [49]) |
| ***posSchedulingInfoList***List of scheduling information for SI messages. If *si-SchedulingInfo-v1700* is present, the network ensures that the total number of SI messages in the concatenated list of SI messages configured by *posSchedulingInfoList* in *posSI-SchedulingInfo* and SI messages containing type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700* does not exceed the limit of *maxSI-Message*. |
| ***posSI-BroadcastStatus***Indicates if the SI message is being broadcasted or not. Change of *posSI-BroadcastStat*us should not result in system information change notifications in Short Message transmitted with P-RNTI over DCI (see clause 6.5). The value of the indication is valid until the end of the BCCH modification period when set to *broadcasting*. |
| ***posSI-RequestConfig***Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *posSI-BroadcastStatus* or *si-BroadcastStatus* of the type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700*, if present, is set to *notBroadcasting*. |
| ***posSI-RequestConfigRedCap***Configuration of Msg1 resources for *initialUplinkBWP-RedCap*that the RedCap UE uses for requesting SI-messages for which *posSI-BroadcastStatus* or *si-BroadcastStatus* of the type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700*, if present, is set to *notBroadcasting*. |
| ***posSI-RequestConfigSUL***Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *posSI-BroadcastStatus* or *si-BroadcastStatus* of the type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700*, if present, is set to *notBroadcasting*. |
| ***posSIB-MappingInfo***List of the posSIBs mapped to this *SystemInformation* message. |
| ***posSibType***The positioning SIB type is defined in TS 37.355 [49]. |
| ***posSI-Periodicity***Periodicity of the SI-message in radio frames, such that rf8 denotes 8 radio frames, rf16 denotes 16 radio frames, and so on. If the *offsetToSI-Used* is configured, the *posSI-Periodicity* of rf8 cannot be used. |
| ***offsetToSI-Used***This field, if present, indicates that all the SI messages in *posSchedulingInfoList* are scheduled with an offset of 8 radio frames compared to SI messages in *schedulingInfoList*. *offsetToSI-Used* may be present only if the shortest configured SI message periodicity for SI messages in *schedulingInfoList* is 80ms. If SI offset is used, this field is present in each of the SI messages in the *posSchedulingInfoList*. |
| ***sbas-id***The presence of this field indicates that the positioning SIB type is for a specific SBAS. Indicates a specific SBAS (see also TS 37.355 [49]). |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *GNSS-ID-SBAS* | The field is mandatory present if *gnss-id* is set to *sbas*. It is absent otherwise. |
| *MSG-1* | The field is optionally present, Need R, if *posSI-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *posSchedulingInfoList* or if *si-BroadcastStatus* is set to *notBroadcasting* for any SI-message containing type2 SIB included in *schedulingInfoList2*. It is absent otherwise. |
| *SUL-MSG-1* | The field is optionally present, Need R, if *supplementaryUplink* is configured in *ServingCellConfigCommonSIB,* and if *posSI-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *posSchedulingInfoList* or if *si-BroadcastStatus* is set to *notBroadcasting* for anySI-message containing type2 SIB included in *schedulingInfoList2*. It is absent otherwise. |
| *REDCAP-MSG-1* | The field is optionally present, Need R, if *initialUplinkBWP-RedCap* is configured in *UplinkConfigCommonSIB,* and if *posSI-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *posSchedulingInfoList* or if *si-BroadcastStatus* is set to *notBroadcasting* for anySI-message containing type2 SIB included in *schedulingInfoList2*. It is absent otherwise. |

*Next Change (Change 1)*

### 6.3.2 Radio resource control information elements

#### – *AdditionalSpectrumEmission*

*<Skip umodified changes>*

– *SI-SchedulingInfo*

The IE *SI-SchedulingInfo* contains information needed for acquisition of SI messages.

***SI-SchedulingInfo* information element**

-- ASN1START

-- TAG-SI-SCHEDULINGINFO-START

SI-SchedulingInfo ::= SEQUENCE {

 schedulingInfoList SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo,

 si-WindowLength ENUMERATED {s5, s10, s20, s40, s80, s160, s320, s640, s1280, s2560-v1710, s5120-v1710 },

 si-RequestConfig SI-RequestConfig OPTIONAL, -- Cond MSG-1

 si-RequestConfigSUL SI-RequestConfig OPTIONAL, -- Cond SUL-MSG-1

 systemInformationAreaID BIT STRING (SIZE (24)) OPTIONAL, -- Need R

 ...

}

SchedulingInfo ::= SEQUENCE {

 si-BroadcastStatus ENUMERATED {broadcasting, notBroadcasting},

 si-Periodicity ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

 sib-MappingInfo SIB-Mapping

}

SI-SchedulingInfo-v1700 ::= SEQUENCE {

 schedulingInfoList2-r17 SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo2-r17,

 dummy SI-RequestConfig OPTIONAL

}

SI-SchedulingInfo-v1740 ::= SEQUENCE {

 si-RequestConfigRedCap-r17 SI-RequestConfig OPTIONAL -- Cond REDCAP-MSG-1

}

SchedulingInfo2-r17 ::= SEQUENCE {

 si-BroadcastStatus-r17 ENUMERATED {broadcasting, notBroadcasting},

 si-WindowPosition-r17 INTEGER (1..256),

 si-Periodicity-r17 ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

 sib-MappingInfo-r17 SIB-Mapping-v1700

}

SIB-Mapping ::= SEQUENCE (SIZE (1..maxSIB)) OF SIB-TypeInfo

SIB-Mapping-v1700 ::= SEQUENCE (SIZE (1..maxSIB)) OF SIB-TypeInfo-v1700

SIB-TypeInfo ::= SEQUENCE {

 type ENUMERATED {sibType2, sibType3, sibType4, sibType5, sibType6, sibType7, sibType8, sibType9,

 sibType10-v1610, sibType11-v1610, sibType12-v1610, sibType13-v1610,

 sibType14-v1610, spare3, spare2, spare1,... },

 valueTag INTEGER (0..31) OPTIONAL, -- Cond SIB-TYPE

 areaScope ENUMERATED {true} OPTIONAL -- Need S

}

SIB-TypeInfo-v1700 ::= SEQUENCE {

 sibType-r17 CHOICE {

 type1-r17 ENUMERATED {sibType15, sibType16, sibType17, sibType18, sibType19, sibType20, sibType21,

 spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1,...},

 type2-r17 SEQUENCE {

 posSibType-r17 ENUMERATED {posSibType1-9, posSibType1-10, posSibType2-24, posSibType2-25,

 posSibType6-4, posSibType6-5, posSibType6-6, posSibType2-17a-v1770,

 posSibType2-18a-v1770, posSibType2-20a-v1770, spare6,

 spare5, spare4, spare3, spare2, spare1,...},

 encrypted-r17 ENUMERATED { true } OPTIONAL, -- Need R

 gnss-id-r17 GNSS-ID-r16 OPTIONAL, -- Need R

 sbas-id-r17 SBAS-ID-r16 OPTIONAL -- Cond GNSS-ID-SBAS

 }

 },

 valueTag-r17 INTEGER (0..31) OPTIONAL, -- Cond NonPosSIB

 areaScope-r17 ENUMERATED {true} OPTIONAL -- Need S

}

-- TAG-SI-SCHEDULINGINFO-STOP

-- ASN1STOP

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| --- |
| ***SchedulingInfo* field descriptions** |
| ***areaScope***Indicates that a SIB is area specific. If the field is absent, the SIB is cell specific. |
| ***si-BroadcastStatus***Indicates if the SI message is being broadcasted or not. Change of *si-BroadcastStat*us should not result in system information change notifications in Short Message transmitted with P-RNTI over DCI (see clause 6.5). The value of the indication is valid until the end of the BCCH modification period when set to *broadcasting.* When *SIB19* is scheduled, the *si-BroadcastStatus* for the mapped *SIB19* is set to *broadcasting*. |
| ***si-Periodicity***Periodicity of the SI-message in radio frames. Value *rf8* corresponds to 8 radio frames, value *rf16* corresponds to 16 radio frames, and so on. |

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| --- |
| ***SI-SchedulingInfo* field descriptions** |
| ***dummy***This field is not used in this specification. If received, it is ignored by the UE. |
| ***schedulingInfoList, schedulingInfoList2***List of scheduling information for SI messages. If *si-SchedulingInfo-v1700* is present, the network ensures that the total number of SI messages in the list of concatenated SI messages configured by *schedulingInfoList* in *si-SchedulingInfo* and SI messages containing type1 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700* does not exceed the limit of *maxSI-Message*. |
| ***si-RequestConfig***Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *si-BroadcastStatus* is set to *notBroadcasting*. |
| ***si-RequestConfigRedCap***Configuration of Msg1 resources for *initialUplinkBWP-RedCap*that the RedCap UE uses for requesting SI-messages for which *si-BroadcastStatus* is set to *notBroadcasting*. |
| ***si-RequestConfigSUL***Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *si-BroadcastStatus* is set to *notBroadcasting*. |
| ***si-WindowLength***The length of the SI scheduling window. Value *s5* corresponds to 5 slots, value *s10* corresponds to 10 slots and so on. The network always configures *si-WindowLength* to be shorter than or equal to the *si-Periodicity*. The values *s2560-v1710* and *s5120-v1710* are only applicable for SCS 480 kHz. |
| ***systemInformationAreaID***Indicates the system information area that the cell belongs to, if any. Any SIB with *areaScope* within the SI is considered to belong to this *systemInformationAreaID*. The systemInformationAreaID is unique within a PLMN/SNPN. |

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| ***SchedulingInfo2* field descriptions** |
| ***encrypted***The presence of this field indicates that the pos-sib-type is encrypted as specified in TS 37.355 [49]. |
| ***gnss-id***The presence of this field indicates that the positioning SIB type is for a specific GNSS. Indicates a specific GNSS (see also TS 37.355 [49]) |
| ***posSibType***The posSIBs as defined in TS 37.355 [49] mapped to SI for scheduling using*schedulingInfoList2*.  |
| ***sbas-id***The presence of this field indicates that the positioning SIB type is for a specific SBAS. Indicates a specific SBAS (see also TS 37.355 [49]). |
| ***si-WindowPosition***This field indicates the SI window position of the associated SI-message. The network provides *si-WindowPosition* in an ascending order, i.e. *si-WindowPosition* in the subsequent entry in *schedulingInfoList2* has always value higher than in the previous entry of *schedulingInfoList2*. The network configures this field in a way that ensures that SI messages scheduled by *schedulingInfoList* and/or *posSchedulingInfoList* do not overlap with SI messages scheduled by *schedulingInfoList2*. |
| ***sib-MappingInfo***Indicates which SIBs or posSIBs are contained in the SI message. |
| ***sibType***The type of SIB(s) mapped to SI for scheduling using*schedulingInfoList2*. Value *type1* indicates SIBs and value *type2* indicates posSIBs. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *GNSS-ID-SBAS* | The field is mandatory present if *gnss-id* is set to *sbas*. It is absent otherwise. |
| *MSG-1* | The field is optionally present, Need R, if *si-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *schedulingInfoList* oranySI-message containing type1 SIB included in *schedulingInfoList2*. It is absent otherwise. |
| *SIB-TYPE* | The field is mandatory present if the SIB type is different from *SIB6*, *SIB7* or *SIB8*. For *SIB6*, *SIB7* and *SIB8* it is absent. |
| *NonPosSIB* | The field is mandatory present if the SIB type is *type1*. For *type2* it is absent. |
| *SUL-MSG-1* | The field is optionally present, Need R, if *supplementaryUplink* is configured in *ServingCellConfigCommonSIB* and if *si-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *schedulingInfoList* oranySI-message containing type1 SIB included in *schedulingInfoList2*. It is absent otherwise. |
| *REDCAP-MSG-1* | The field is optionally present, Need R, if *initialUplinkBWP-RedCap* is configured in *UplinkConfigCommonSIB* and if *si-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *schedulingInfoList* oranySI-message containing type1 SIB included in *schedulingInfoList2*. It is absent otherwise. |

*End of Changes*