**3GPP TSG-RAN WG2 Meeting #112 electronic R2-20xxxxx**

**Online, 02 - 13 Nov 2020**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **2274** | **rev** | **-** | **Current version:** | **16.2.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Correction on RRC parameters for NR SL communication |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon  |
| ***Source to TSG:*** | R2  |
|  |  |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core  |  | ***Date:*** | 2020-11-02 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | 1. It was agreed in RAN2 #112e to make dummy for the field *sl-BandWidth* included in SIB13, because it cannot be actually used for NR Uu control of V2X sidelink communication.
2. According to L1 parameter sheet (R1-2005050), the parameter *sl-TimeResource* should be a variable length BIT STING, but it is now erroneously defined as an INTEGER.

|  |  |  |
| --- | --- | --- |
| timeresourcepool | Indicates the bitmap of the resource pool, which is defined by repeating the bitmap with a periodicity during a SFN or DFN cycle  | ~~TBD~~ 10, 11, 12, …, 160 |

1. The RRC parameter *sl-DCI-ToSL-Trans*, corresponding to *timeGapFirstSidelinkTransmission* in L1 parameter sheet (R1-2003190), was removed from version “-g20”, due to the undetermined value range at that time. As this parameter is indispensable for dynamic scheduling and configured sidelink grant mode-2 to work for NR SL mode-1, it must be specified and thus need be added back. As per RAN1 LS in R1-2009577, the following agreements were reached on the value range of this parameter in RAN1 #103e:

*RAN1 has made the following agreement regarding the values for sl-DCI-ToSL-Trans:*

|  |
| --- |
| Agreements:* The configurable values for sl-DCI-ToSL-Trans are:
	+ 1-32 slots (using SL numerology)
 |

*which is related to the following agreement made in RAN1#98bis:*

|  |
| --- |
| Agreements:* To signal the gap between DCI reception and the first sidelink transmission scheduled by DCI:
	+ A table of values is configured by RRC.
	+ DCI determines which of the configured values is used.
	+ FFS how to determine the slot for the first sidelink transmission (e.g., based on the indicated value, potential async between Uu & SL, different numerologies, etc.)
	+ FFS if the gap is in physical or logical slots.
 |

Considering that this RRC parameter corresponds to the parameter “Time gap” in DCI format 3\_0, which has 3 bits as follows (TS 38.212, subclause 7.3.1.4.1), totally 8 configurable values can therefore be configured by this field *sl-DCI-ToSL-Trans*.- Time gap – 3 bits determined by higher layer parameter *sl-DCI-ToSL-Trans*, as defined in clause 8.1.2.1 of [6, TS 38.214]1. RAN2#111-e agreed that the fields *sl-PrioritizationThres-r16* and *ul-PrioritizationThres-r16* are configured to the UE together or not at all, i.e. there is no case where only one threshold is configured.
	* This restriction was captured in 38.331 for the scheduled (mode 1) case with a conditional table saying that each field is mandatory present if the other is configured, which, however, means that the network is required to include both fields in every message containing the *MAC-MainConfigSL* if the values are configured to the UE. Thus, for example, if the network wants to change the *BSR-Config*, it must re-signal both prioritization thresholds even though they have not changed. This makes the Need M behaviour vacuous.
	* The restriction was not captured for the UE-selected (mode 2) case.
2. There was a previous RAN1 agreement that S-SSB transmission number of 2/3/8 within one S-SSB period are not supported for 15/30/60 KHz SCS for FR1, respectively. This agreement now fails to be reflected in the current Spec.

Agreements (RAN1#98bis):•      Do not support 2/4/8 as the number of S-SSB transmissions within one S-SSB period for 15/30/60 KHz SCS for FR1, respectively. |
|  |  |
| ***Summary of change:*** | 1. In SIB13, make the field sl-BandWidth in SIB13 into “dummy”, and clarify that it shall be ignored by the UE, if it is received.
2. In the IE *SL-ResourcePool*, change the existing parameter *sl-TimeResource* into “dummy”, and add the revised *sl-TimerResource* as a new paremater via non-critical extension.
3. In the IE *SL-ScheduledConfig*, capture the L1 parameter *sl-DCI-ToSL-Trans* as per RAN1 agreements made in TAN1 #103e.
4. For the priority thresholds for SL/UL TX prioritization, make the following changes:
	* Conditional table for *SL-ScheduledConfig*/*MAC-MainConfigSL* is replaced with statements in the field descriptions for *sl-PrioritizationThres-r16* and *ul-PrioritizationThres-r16* that the values are not configured to the UE separately.
	* Statements that the values are not configured to the UE separately are added to the field descriptions of *sl-PrioritizationThres-r16* and *ul-PrioritizationThres-r16* under *SL-UE-SelectedConfig*.
5. In the field description of the IE *SL-SyncConfig*, remove the S-SSB transmission number of 2/4/8 within one S-SSB period for 15/30/60 KHz SCS for FR1.

**Impact analysis****Impacted functionality**NR sidelink communication**Inter-operability:** If the CR is implemented by the NW but is not implemented by the UE, there are inter-operability issues between the UE and the NW as follows:* The UE will receive the parameter *sl-BandWidth* which cannot be correctly used by the UE for NR control of V2X sidelink communication (related to Change 1).
* The related features of resource pool configuration and NR sidelink mode 1 do not actually work, with the UE unable to apply the related configurations in a correct way (related to Change 2 and 3).
* Regarding SL/UL TX prioritization, for mode-1 network may not include the threshold fields in a configuration to the UE. A UE that applies strict checks for compliance with the conditional table may consider this to be a network error and show unexpected behaviour. By contrast, for mode-2, there is no interoperability issue. (related to Change 4)

There is no inter-operability issue for Change 5 in this case where the NW implements the CR but the UE does not.If the CR is implemented by the UE but is not implemented by the NW, there are inter-operability issues between the UE and the NW as follows:* The related features of resource pool configuration and NR sidelink mode 1 do not actually work, with the NW providing wrong configurations (related to Change 2 and 3).
* Regarding SL/UL TX prioritization, for mode-2 the network may violate the agreed constraint and omit one of the threshold fields, resulting in the UE not knowing how to apply the single threshold in isolation. By contrast, for mode-1 there is no interoperability issue (related to Change 4)

There is no inter-operability issue for Change 1 and Change 5 in this case where the UE implements the CR but the NW does not. If the CR is implemented by one UE but is not implemented by another UE, there are inter-operability issues as follows:* The related features of resource pool configuration and NR sidelink mode 1 do not actually work (related to Change 2 and 3).
* A UE may configure a number of sidelink SSB transmissions within one sidelink SSB period that are not supported. (related to Change 5)

There is no inter-operability issue for Change 1 and Change 4 in this case where the one UE implements the CR but another UE does not. |
|  |  |
| ***Consequences if not approved:*** | 1. A field which is unable to be correctly applied is defined in SIB13, leading to potentially unexpected UE hehaviour.
2. The resource pool configuration does not work in the current Specs.
3. The NR sidelink mode-1 does not work in the current Specs.
4. Network is constrained to always include the prioritization fields when a value is configured for them, in the scheduled case. Network may violate the agreed constraint on the fields in the UE-selected case.
5. There can be the problem for the sidelink SSB transmission and reception between the UEs.
 |
|  |  |
| ***Clauses affected:*** | 6.3.1, 6.3.5 |
|  |  |
|  | **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:*** |  |

|  |
| --- |
| START of CHANGE |

6.3.1 System information blocks

<Unrelated Texts Omitted>

– *SIB13*

SIB13 contains configurations of V2X sidelink communication defined in TS 36.331 [10].

***SIB13* information element**

-- ASN1START

-- TAG-SIB13-START

SIB13-r16 ::= SEQUENCE {

 sl-V2X-ConfigCommon-r16 OCTET STRING,

 dummy OCTET STRING,

 tdd-Config-r16 OCTET STRING,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 ...

}

-- TAG-SIB13-STOP

-- ASN1STOP

| ***SIB13* field descriptions** |
| --- |
| ***dummy***This field is not used in the specification. If received it shall be ignored by the UE. |
|  |
| ***sl-V2X-ConfigCommon***This field includes the E-UTRA SystemInformationBlockType21 message as specified in TS 36.331 [10]. |
| ***tdd-Config***This field includes the tdd-Config in E-UTRA SystemInformationBlockType1 message as specified in TS 36.331 [10]. |

|  |
| --- |
| NEXT CHANGE |

6.3.5 Sidelink information elements

<Unrelated Texts Omitted>

– *SL-ResourcePool*

The IE *SL-ResourcePool* specifies the configuration information for NR sidelink communication resource pool.

***SL-ResourcePool* information element**

-- ASN1START

-- TAG-SL-RESOURCEPOOL-START

SL-ResourcePool-r16 ::= SEQUENCE {

 sl-PSCCH-Config-r16 SetupRelease { SL-PSCCH-Config-r16 } OPTIONAL, -- Need M

 sl-PSSCH-Config-r16 SetupRelease { SL-PSSCH-Config-r16 } OPTIONAL, -- Need M

 sl-PSFCH-Config-r16 SetupRelease { SL-PSFCH-Config-r16 } OPTIONAL, -- Need M

 sl-SyncAllowed-r16 SL-SyncAllowed-r16 OPTIONAL, -- Need M

 sl-SubchannelSize-r16 ENUMERATED {n10, n12, n15, n20, n25, n50, n75, n100} OPTIONAL, -- Need M

 dummy INTEGER (10..160) OPTIONAL, -- Need M

 sl-StartRB-Subchannel-r16 INTEGER (0..265) OPTIONAL, -- Need M

 sl-NumSubchannel-r16 INTEGER (1..27) OPTIONAL, -- Need M

 sl-Additional-MCS-Table-r16 ENUMERATED {qam256, qam64LowSE, qam256-qam64LowSE } OPTIONAL, -- Need M

 sl-ThreshS-RSSI-CBR-r16 INTEGER (0..45) OPTIONAL, -- Need M

 sl-TimeWindowSizeCBR-r16 ENUMERATED {ms100, slot100} OPTIONAL, -- Need M

 sl-TimeWindowSizeCR-r16 ENUMERATED {ms1000, slot1000} OPTIONAL, -- Need M

 sl-PTRS-Config-r16 SL-PTRS-Config-r16 OPTIONAL, -- Need M

 sl-UE-SelectedConfigRP-r16 SL-UE-SelectedConfigRP-r16 OPTIONAL, -- Need M

 sl-RxParametersNcell-r16 SEQUENCE {

 sl-TDD-Configuration-r16 TDD-UL-DL-ConfigCommon OPTIONAL, -- Need M

 sl-SyncConfigIndex-r16 INTEGER (0..15)

 } OPTIONAL, -- Need M

 sl-ZoneConfigMCR-List-r16 SEQUENCE (SIZE (16)) OF SL-ZoneConfigMCR-r16 OPTIONAL, -- Need M

 sl-FilterCoefficient-r16 FilterCoefficient OPTIONAL, -- Need M

 sl-RB-Number-r16 INTEGER (10..275) OPTIONAL, -- Need M

 sl-PreemptionEnable-r16 ENUMERATED {enabled, pl1, pl2, pl3, pl4, pl5, pl6, pl7, pl8} OPTIONAL, -- Need R

 sl-PriorityThreshold-UL-URLLC-r16 INTEGER (1..9) OPTIONAL, -- Need M

 sl-PriorityThreshold-r16 INTEGER (1..9) OPTIONAL, -- Need M

 sl-X-Overhead-r16 ENUMERATED {n0,n3, n6, n9} OPTIONAL, -- Need S

 sl-PowerControl-r16 SL-PowerControl-r16 OPTIONAL, -- Need M

 sl-TxPercentageList-r16 SL-TxPercentageList-r16 OPTIONAL, -- Need M

 sl-MinMaxMCS-List-r16 SL-MinMaxMCS-List-r16 OPTIONAL, -- Need M

 ...,

 [[

 sl-TimeResource-r16 BIT STRING (SIZE (10..160)) OPTIONAL -- Need M

 ]]

}

SL-ZoneConfigMCR-r16 ::= SEQUENCE {

 sl-ZoneConfigMCR-Index-r16 INTEGER (0..15),

 sl-TransRange-r16 ENUMERATED {m20, m50, m80, m100, m120, m150, m180, m200, m220, m250, m270, m300, m350,

 m370, m400, m420, m450, m480, m500, m550, m600, m700, m1000, spare9, spare8,

 spare7, spare6, spare5, spare4, spare3, spare2, spare1}

 OPTIONAL, -- Need M

 sl-ZoneConfig-r16 SL-ZoneConfig-r16 OPTIONAL, -- Need M

 ...

}

SL-SyncAllowed-r16 ::= SEQUENCE {

 gnss-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

 gnbEnb-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

 ue-Sync-r16 ENUMERATED {true} OPTIONAL -- Need R

}

SL-PSCCH-Config-r16 ::= SEQUENCE {

 sl-TimeResourcePSCCH-r16 ENUMERATED {n2, n3} OPTIONAL, -- Need M

 sl-FreqResourcePSCCH-r16 ENUMERATED {n10,n12, n15, n20, n25} OPTIONAL, -- Need M

 sl-DMRS-ScrambleID-r16 INTEGER (0..65535) OPTIONAL, -- Need M

 sl-NumReservedBits-r16 INTEGER (2..4) OPTIONAL, -- Need M

 ...

}

SL-PSSCH-Config-r16 ::= SEQUENCE {

 sl-PSSCH-DMRS-TimePatternList-r16 SEQUENCE (SIZE (1..3)) OF INTEGER (2..4) OPTIONAL, -- Need M

 sl-BetaOffsets2ndSCI-r16 SEQUENCE (SIZE (4)) OF SL-BetaOffsets-r16 OPTIONAL, -- Need M

 sl-Scaling-r16 ENUMERATED {f0p5, f0p65, f0p8, f1} OPTIONAL, -- Need M

 ...

}

SL-PSFCH-Config-r16 ::= SEQUENCE {

 sl-PSFCH-Period-r16 ENUMERATED {sl0, sl1, sl2, sl4} OPTIONAL, -- Need M

 sl-PSFCH-RB-Set-r16 BIT STRING (SIZE (10..275)) OPTIONAL, -- Need M

 sl-NumMuxCS-Pair-r16 ENUMERATED {n1, n2, n3, n6} OPTIONAL, -- Need M

 sl-MinTimeGapPSFCH-r16 ENUMERATED {sl2, sl3} OPTIONAL, -- Need M

 sl-PSFCH-HopID-r16 INTEGER (0..1023) OPTIONAL, -- Need M

 sl-PSFCH-CandidateResourceType-r16 ENUMERATED {startSubCH, allocSubCH} OPTIONAL, -- Need M

 ...

}

SL-PTRS-Config-r16 ::= SEQUENCE {

 sl-PTRS-FreqDensity-r16 SEQUENCE (SIZE (2)) OF INTEGER (1..276) OPTIONAL, -- Need M

 sl-PTRS-TimeDensity-r16 SEQUENCE (SIZE (3)) OF INTEGER (0..29) OPTIONAL, -- Need M

 sl-PTRS-RE-Offset-r16 ENUMERATED {offset01, offset10, offset11} OPTIONAL, -- Need M

 ...

}

SL-UE-SelectedConfigRP-r16 ::= SEQUENCE {

 sl-CBR-PriorityTxConfigList-r16 SL-CBR-PriorityTxConfigList-r16 OPTIONAL, -- Need M

 sl-ThresPSSCH-RSRP-List-r16 SL-ThresPSSCH-RSRP-List-r16 OPTIONAL, -- Need M

 sl-MultiReserveResource-r16 ENUMERATED {enabled} OPTIONAL, -- Need M

 sl-MaxNumPerReserve-r16 ENUMERATED {n2, n3} OPTIONAL, -- Need M

 sl-SensingWindow-r16 ENUMERATED {ms100, ms1100} OPTIONAL, -- Need M

 sl-SelectionWindowList-r16 SL-SelectionWindowList-r16 OPTIONAL, -- Need M

 sl-ResourceReservePeriodList-r16 SEQUENCE (SIZE (1..16)) OF SL-ResourceReservePeriod-r16 OPTIONAL, -- Need M

 sl-RS-ForSensing-r16 ENUMERATED {pscch, pssch},

 ...

}

SL-ResourceReservePeriod-r16 ::= CHOICE {

 sl-ResourceReservePeriod1-r16 ENUMERATED {ms0, ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000},

 sl-ResourceReservePeriod2-r16 INTEGER (1..99)

}

SL-SelectionWindowList-r16 ::= SEQUENCE (SIZE (8)) OF SL-SelectionWindowConfig-r16

SL-SelectionWindowConfig-r16 ::= SEQUENCE {

 sl-Priority-r16 INTEGER (1..8),

 sl-SelectionWindow-r16 ENUMERATED {n1, n5, n10, n20}

}

SL-TxPercentageList-r16 ::= SEQUENCE (SIZE (8)) OF SL-TxPercentageConfig-r16

SL-TxPercentageConfig-r16 ::= SEQUENCE {

 sl-Priority-r16 INTEGER (1..8),

 sl-TxPercentage-r16 ENUMERATED {p20, p35, p50}

}

SL-MinMaxMCS-List-r16 ::= SEQUENCE (SIZE (1..3)) OF SL-MinMaxMCS-Config-r16

SL-MinMaxMCS-Config-r16 ::= SEQUENCE {

 sl-MCS-Table-r16 ENUMERATED {qam64, qam256, qam64LowSE},

 sl-MinMCS-PSSCH-r16 INTEGER (0..27),

 sl-MaxMCS-PSSCH-r16 INTEGER (0..31)

}

SL-BetaOffsets-r16 ::= INTEGER (0..31)

SL-PowerControl-r16 ::= SEQUENCE {

 sl-MaxTransPower-r16 INTEGER (-30..33),

 sl-Alpha-PSSCH-PSCCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need M

 dl-Alpha-PSSCH-PSCCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need S

 sl-P0-PSSCH-PSCCH-r16 INTEGER (-16..15) OPTIONAL, -- Need S

 dl-P0-PSSCH-PSCCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

 dl-Alpha-PSFCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need S

 dl-P0-PSFCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

 ...

}

-- TAG-SL-RESOURCEPOOL-STOP

-- ASN1STOP

| ***SL-ZoneConfigMCR* field descriptions** |
| --- |
| ***sl-TransRange***Indicates the communication range requirement for the corresponding *sl-ZoneConfigMCR-Index*. |
| ***sl-ZoneConfig***Indicates the zone configuration for the corresponding *sl-ZoneConfigMCR-Index*. |
| ***sl-ZoneConfigMCR-Index***Indicates the codepoint of the communication range requirement field in SCI. |

|  |
| --- |
| ***SL-ResourcePool* field descriptions** |
| ***dummy***This field is not used in the specification. If received it shall be ignored by the UE. |
| ***sl-FilterCoefficient***This field indicates the filtering coefficient for long-term measurement and reference signal power derivation used for sideilnk open-loop power control. |
| ***sl-Additional-MCS-Table***Indicates the MCS table(s) additionally used in the resource pool. 64QAM table is (pre-)configured as default. Zero, one or two can be additionally (pre-)configured using the 256QAM and/or low-SE MCS tables |
| ***sl-NumSubchannel***Indicates the number of subchannels in the corresponding resource pool, which consists of contiguous PRBs only. |
| ***sl-PreemptionEnable***Indiates whether pre-emption is disabled or enabled in a resource pool. If enabled, a priority level p\_preemption can be optionally configured. If the pre-emption is enabled but p\_preemption is not configured, pre-emption is applicable to all levels. |
| ***sl-PriorityThreshold-UL-URLLC***Indicates the threshold used to determine whether NR sidelink transmission or PUCCH transmission carrying SL HARQ is prioritized over uplink transmission of priority index 1 if they overlap in time. |
| ***sl-PriorityThreshold***Indicates the threshold used to determine whether NR sidelink transmission or PUCCH transmission carrying SL HARQ is prioritized over uplink transmission of priority index 0 if they overlap in time. |
| ***sl-RB-Number***Indicates the number of PRBs in the corresponding resource pool, which consists of contiguous PRBs only. The remaining RB cannot be used (See TS 38.214[19], clause 8). |
| ***sl-StartRB-Subchannel***Indicates the lowest RB index of the subchannel with the lowest index in the resource pool with respect to the lowest RB index of a SL BWP. |
| ***sl-SubchannelSize***Indicates the minimum granularity in frequency domain for the sensing for PSSCH resource selection in the unit of PRB. |
| ***sl-SyncAllowed***Indicates the allowed synchronization reference(s) which is (are) allowed to use the configured resource pool. |
| ***sl-SyncConfigIndex***Indicates the synchronisation configuration that is associated with a reception pool, by means of an index to the corresponding entry *SL-SyncConfigList* of in *SIB12* for NR sidelink communication. |
| ***sl-TDD-Configuration***Indicates the TDD configuration associated with the reception pool of the cell indicated by *sl-SyncConfigIndex*. |
| ***sl-ThreshS-RSSI-CBR***Indicates the S-RSSI threshold for determining the contribution of a sub-channel to the CBR measurement. Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n\*2) dBm, and so on. |
| ***sl-TimeResource***Indicates the bitmap of the resource pool, which is defined by repeating the bitmap with a periodicity during a SFN or DFN cycle. |
| ***sl-TimeWindowSizeCBR***Indicates the time window size for CBR measurement. |
| ***sl-TimeWindowSizeCR***Indicates the time window size for CR evaluation. |
| ***sl-TxPercentageList***Indicates the portion of candidate single-slot PSSCH resources over the toal resources. Value p20 corresponds to 20%, and so on. |
| ***sl-X-Overhead***Accounts for overhead from CSI-RS, PT-RS. If the field is absent, the UE applies value *n0* (see TS 38.214 [19], clause 5.1.3.2). |

| ***SL-SyncAllowed* field descriptions** |
| --- |
| ***gnbEnb-Sync***If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to eNB or gNB (i.e., synchronized to a reference UE which is directly synchronized to eNB or gNB). |
| ***gnss-Sync***If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to GNSS (i.e., synchronized to a reference UE which is directly synchronized to GNSS). |
| ***ue-Sync***If configured, the (pre-) configured resources can be used if the UE is synchronized to a reference UE which is not synchronized to eNB, gNB and GNSS directly or indirectly. |

| ***SL-PSCCH* field descriptions** |
| --- |
| ***sl-FreqResourcePSCCH***Indicates the number of PRBs for PSCCH in a resource pool where it is not greater than the number PRBs of the subchannel. |
| ***sl-DMRS-ScrambleID***Indicates the initialization value for PSCCH DMRS scrambling. |
| ***sl-NumReservedBits***Indicates the number of reserved bits in first stage SCI. |
| ***sl-TimeResourcePSCCH***Indicates the number of symbols of PSCCH in a resource pool. |

| ***SL-PSSCH* field descriptions** |
| --- |
| ***sl-BetaOffsets2ndSCI***Indicates candidates of beta-offset values to determine the number of coded modulation symbols for second stage SCI. The value indicates the index of Table 9.3-2 of TS 38.213 |
| ***sl-PSSCH-DMRS-TimePatternList***Indicates the set of PSSCH DMRS time domain patterns in terms of PSSCH DMRS symbols in a slot that can be used in the resource pool. |
| ***sl-Scaling***Indicates a scaling factor to limit the number of resource elements assigned to the second stage SCI on PSSCH. Value *f0p5* corresponds to 0.5, value *f0p65* corresponds to 0.65, and so on. |

| ***SL-PSFCH* field descriptions** |
| --- |
| ***sl-PSFCH-CandidateResourceType***Indicates the number of PSFCH resources available for multiplexing HARQ-ACK information in a PSFCH transmission (see TS 38.213 clause 16.3) |
| ***sl-PSFCH-Period***Indicates the period of PSFCH resource in the unit of slots within this resource pool. If set to *sl0*, no resource for PSFCH, and HARQ feedback for all transmissions in the resource pool is disabled. |
| ***sl-PSFCH-RB-Set***Indicates the set of PRBs that are actually used for PSFCH transmission and reception. The leftmost bit of the bitmap refers to the lowest RB index in the resource pool, and so on |

| ***SL-UE-SelectedConfigRP* field descriptions** |
| --- |
| ***sl-MaxNumPerReserve***Indicates the maximum number of reserved PSCCH/PSSCH resources that can be indicated by an SCI. |
| ***sl-MultiReserveResource***Indicates if it is allowed to reserve a sidelink resource for an initial transmission of a TB by an SCI associated with a different TB, based on sensing and resource selection procedure. |
| ***sl-ResourceReservePeriodList***Set of possible resource reservation period allowed in the resource pool in the unit of ms. Up to 16 values can be configured per resource pool. |
| ***sl-RS-ForSensing***Indicates whether DMRS of PSCCH or PSSCH is used for L1 RSRP measurement in the sensing operation. |
| ***sl-SensingWindow***Parameter that indicates the start of the sensing window. |
| ***sl-SelectionWindowList***Parameter that determines the end of the selection window in the resource selection for a TB with respect to priority indicated in SCI. Value n1 corresponds to 1\*2µ, value n5 corresponds to 5\*2µ, and so on, where µ = 0,1,2,3 for SCS 15,30,60,120 kHz respectively. |
| ***sl-ThresPSSCH-RSRP-List***Indicates a list of 64 thresholds, and the threshold should be selected based on the priority in the decoded SCI and the priority in the SCI to be transmitted. A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above a threshold. |

| ***SL-PowerControl* field descriptions** |
| --- |
| ***sl-MaxTransPower***Indicates the maximum value of the UE's sidelink transmission power on this resource pool. The unit is dBm. |
| ***sl-Alpha-PSSCH-PSCCH***Indicates alpha value for sidelink pathloss based power control for PSCCH/PSSCH when sl-P0-PSSCH is configured. When the field is absent the UE applies the value 1.  |
| ***sl-P0-PSSCH-PSCCH***Indicates P0 value for sidelink pathloss based power control for PSCCH/PSSCH. If not configured, sidelink pathloss based power control is disabled for PSCCH/PSSCH. |
| ***dl-Alpha-PSSCH-PSCCH***Indicates alpha value for downlink pathloss based power control for PSCCH/PSSCH when dl-P0-PSSCH is configured. When the field is absent the UE applies the value 1.  |
| ***dl-P0-PSSCH-PSCCH***Indicates P0 value for downlink pathloss based power control for PSCCH/PSSCH. If not configured, downlink pathloss based power control is disabled for PSCCH/PSSCH. |
| ***dl-Alpha-PSFCH***Indicates alpha value for downlink pathloss based power control for PSFCH when dl-P0-PSFCH is configured. When the field is absent the UE applies the value 1.  |
| ***dl-P0-PSFCH***Indicates P0 value for downlink pathloss based power control for PSFCH. If not configured, downlink pathloss based power control is disabled for PSFCH. |

| ***SL-MinMaxMCS-Config* field descriptions** |
| --- |
| ***sl-MaxMCS-PSSCH***Indicates the maximum MCS value used for Mode 1 configured and dynamic grants when using the associated MCS table. If no MCS is configured, UE autonomously selects MCS from the full range of values. |
| ***sl-MinMCS-PSSCH***Indicates the minimum MCS value for Mode 1 configured and dynamic grants when using the associated MCS table. If no MCS is configured, UE autonomously selects MCS from the full range of values. |

<Unrelated Texts Omitted>

– *SL-ScheduledConfig*

The IE *SL-ScheduledConfig* specifies sidelink communication configurations used for network scheduled NR sidelink communication.

***SL-ScheduledConfig* information element**

-- ASN1START

-- TAG-SL-SCHEDULEDCONFIG-START

SL-ScheduledConfig-r16 ::= SEQUENCE {

 sl-RNTI-r16 RNTI-Value,

 mac-MainConfigSL-r16 MAC-MainConfigSL-r16 OPTIONAL, -- Need M

 sl-CS-RNTI-r16 RNTI-Value OPTIONAL, -- Need M

 sl-PSFCH-ToPUCCH-r16 SEQUENCE (SIZE (1..8)) OF INTEGER (0..15) OPTIONAL, -- Need M

 sl-ConfiguredGrantConfigList-r16 SL-ConfiguredGrantConfigList-r16 OPTIONAL, -- Need M

 ...,

 [[

 sl-DCI-ToSL-Trans-r16 SEQUENCE (SIZE (1..8)) OF INTEGER (1..32) OPTIONAL -- Need M

 ]]

}

MAC-MainConfigSL-r16 ::= SEQUENCE {

 sl-BSR-Config-r16 BSR-Config OPTIONAL, -- Need M

 ul-PrioritizationThres-r16 INTEGER (1..16) OPTIONAL, -- Need M

 sl-PrioritizationThres-r16 INTEGER (1..8) OPTIONAL, -- Need M

 ...

}

SL-ConfiguredGrantConfigList-r16 ::= SEQUENCE {

 sl-ConfiguredGrantConfigToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofCG-SL-r16)) OF SL-ConfigIndexCG-r16 OPTIONAL, -- Need N

 sl-ConfiguredGrantConfigToAddModList-r16 SEQUENCE (SIZE (1..maxNrofCG-SL-r16)) OF SL-ConfiguredGrantConfig-r16 OPTIONAL -- Need N

}

-- TAG-SL-SCHEDULEDCONFIG-STOP

-- ASN1STOP

| ***SL-ScheduledConfig* field descriptions** |
| --- |
| ***sl-CS-RNTI***Indicate the RNTI used to scramble CRC of DCI format 3\_0, see TS 38.321 [3]. |
| ***sl-DCI-ToSL-Trans***Indicate the time gap between DCI reception and the first sidelink transmission scheduled by the DCI (see TS 38.214 [19], clause 8.1.2.1). Value 1 included in this field corresponds to 1 slot, value 2 corresponds to 2 slots and so on, based on the numerology of sidelink BWP. |
| ***sl-PSFCH-ToPUCCH***For dynamic grant and configured grant type 2, configure the values of the PSFCH to PUCCH gap. The field PSFCH-to-HARQ\_feedback timing indicator in DCI format 3\_0 selects one of the configured values of the PSFCH to PUCCH gap. |
| ***sl-RNTI***Indicate the C-RNTI used for monitoring the network scheduling to transmit NR sidelink communication (i.e. the mode 1). |

| ***MAC-MainConfigSL* field descriptions** |
| --- |
| ***sl-BSR-Config***This field is to configure the sidelink buffer status report. |
| ***sl-PrioritizationThres***Indicates the SL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. Network does not configure the *sl-PrioritizationThres* and the *ul-PrioritizationThres* to the UE separately. |
| ***ul-PrioritizationThres***Indicates the UL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. Network does not configure the *sl-PrioritizationThres* and the *ul-PrioritizationThres* to the UE separately. |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

<Unrelated Texts Omitted>

– *SL-SyncConfig*

The IE *SL-SyncConfig* specifies the configuration information concerning reception of synchronisation signals from neighbouring cells as well as concerning the transmission of synchronisation signals for sidelink communication.

***SL-SyncConfig* information element**

-- ASN1START

-- TAG-SL-SYNCCONFIG-START

SL-SyncConfigList-r16 ::= SEQUENCE (SIZE (1..maxSL-SyncConfig-r16)) OF SL-SyncConfig-r16

SL-SyncConfig-r16 ::= SEQUENCE {

 sl-SyncRefMinHyst-r16 ENUMERATED {dB0, dB3, dB6, dB9, dB12} OPTIONAL, -- Need R

 sl-SyncRefDiffHyst-r16 ENUMERATED {dB0, dB3, dB6, dB9, dB12, dBinf} OPTIONAL, -- Need R

 sl-filterCoefficient-r16 FilterCoefficient OPTIONAL, -- Need R

 sl-SSB-TimeAllocation1-r16 SL-SSB-TimeAllocation-r16 OPTIONAL, -- Need R

 sl-SSB-TimeAllocation2-r16 SL-SSB-TimeAllocation-r16 OPTIONAL, -- Need R

 sl-SSB-TimeAllocation3-r16 SL-SSB-TimeAllocation-r16 OPTIONAL, -- Need R

 sl-SSID-r16 INTEGER (0..671) OPTIONAL, -- Need R

 txParameters-r16 SEQUENCE {

 syncTxThreshIC-r16 SL-RSRP-Range-r16 OPTIONAL, -- Need R

 syncTxThreshOoC-r16 SL-RSRP-Range-r16 OPTIONAL, -- Need R

 syncInfoReserved-r16 BIT STRING (SIZE (2)) OPTIONAL -- Need R

 },

 gnss-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

 ...

}

SL-RSRP-Range-r16 ::= INTEGER (0..13)

SL-SSB-TimeAllocation-r16 ::= SEQUENCE {

 sl-NumSSB-WithinPeriod-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL, -- Need R

 sl-TimeOffsetSSB-r16 INTEGER (0..1279) OPTIONAL, -- Need R

 sl-TimeInterval-r16 INTEGER (0..639) OPTIONAL -- Need R

}

-- TAG-SL-SYNCCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-SyncConfig* field descriptions** |
| ***gnss-Sync***if configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to GNSS. If not configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to eNB/gNB. |
| ***sl-SyncRefMinHyst***Hysteresis when evaluating a SyncRef UE using absolute comparison. |
| ***sl-SyncRefDiffHyst***Hysteresis when evaluating a SyncRef UE using relative comparison. |
| ***sl-NumSSB-WithinPeriod***Indicates the number of sidelink SSB transmissions within one sidelink SSB period. The applicable values are related to the subcarrier spacing and frequency as follows:FR1, SCS = 15 kHz: 1FR1, SCS = 30 kHz: 1, 2FR1, SCS = 60 kHz: 1, 2, 4FR2, SCS = 60 kHz: 1, 2, 4, 8, 16, 32FR2, SCS = 120 kHz: 1, 2, 4, 8, 16, 32, 64 |
| ***sl-TimeOffsetSSB***Indicates the slot offset from the start of sidelink SSB period to the first sidelink SSB. |
| ***sl-TimeInterval***Indicates the slot interval between neighboring sidelink SSBs. This value is applicable when there are more than one sidelink SSBs within one sidelink SSB period. |
| ***sl-SSID***Indicates the ID of sidelink synchronization signal assoicated with different synchronization priorities. |
| ***SL-RSRP-Range***Value 0 corresponds to -infinity, value 1 to -115dBm, value 2 to -110dBm, and so on (i.e. in steps of 5dBm) until value 12, which corresponds to -60dBm, while value 13 corresponds to +infinity. |
| ***syncInfoReserved***Reserved for future use. |

<Unrelated Texts Omitted>

– *SL-UE-SelectedConfig*

IE *SL-UE-SelectedConfig* specifies sidelink communication configurations used for UE autonomous resource selection.

***SL-UE-SelectedConfig* information element**

-- ASN1START

-- TAG-SL-UE-SELECTEDCONFIG-START

SL-UE-SelectedConfig-r16 ::= SEQUENCE {

 sl-PSSCH-TxConfigList-r16 SL-PSSCH-TxConfigList-r16 OPTIONAL, -- Need R

 sl-ProbResourceKeep-r16 ENUMERATED {v0, v0dot2, v0dot4, v0dot6, v0dot8} OPTIONAL, -- Need R

 sl-ReselectAfter-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n7, n8, n9} OPTIONAL, -- Need R

 sl-CBR-CommonTxConfigList-r16 SL-CBR-CommonTxConfigList-r16 OPTIONAL, -- Need R

 ul-PrioritizationThres-r16 INTEGER (1..16) OPTIONAL, -- Need R

 sl-PrioritizationThres-r16 INTEGER (1..8) OPTIONAL, -- Need R

 ...

}

-- TAG-SL-UE-SELECTEDCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-UE-SelectedConfig* field descriptions** |
| ***sl-PrioritizationThres***Indicates the SL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. Network does not configure the *sl-PrioritizationThres* and the *ul-PrioritizationThres* to the UE separately. |
| ***sl-ProbResourceKeep***Indicates the probability with which the UE keeps the current resource when the resource reselection counter reaches zero for sensing based UE autonomous resource selection (see TS 38.321 [3]). |
| ***sl-PSSCH-TxConfigList***Indicates PSSCH TX parameters such as MCS, sub-channel number, retransmission number, associated to different UE absolute speeds and different synchronization reference types for UE autonomous resource selection. |
| ***sl-ReselectAfter***Indicates the number of consecutive skipped transmissions before triggering resource reselection for sidelink communication (see TS 38.321 [3]). |
| ***ul-PrioritizationThres***Indicates the UL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. Network does not configure the *sl-PrioritizationThres* and the *ul-PrioritizationThres* to the UE separately. |

|  |
| --- |
| END OF CHANGE |