3GPP TSG-RAN WG2 #124 R2-23xxxxx

**Chicago, USA, 13th – 17th November 2023**

Agenda Item: 7.2.1

Source: Ericsson

Title: [Post124][415][POS] Rel-18 Positioning 38.331 CR (Ericsson)

Document for: Discussion, Decision

# Introduction

This is to kick off the email discussion.

* [Post124][415][POS] Rel-18 Positioning 38.331 CR (Ericsson)

 Scope: Finalise and check the Rel-18 positioning 38.331 CR (including taking into account parameter list updates).

 Intended outcome: Agreed CR

 Deadline: Short (for RP)

# 2 Discussion

## 2.1 Sidelink

Please provide your comments on the CR for sidelink. The changes are track marked with “sidelinkPositioning”

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| Company Name | Comments |
| Sharp | * **Comment #1, on the field for configuring SL PRS resources within** ***SL-PRS-ResourcePool*:**

We suggest the following yellow highlighted changes:

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| SL-PRS-ResourcePool-r18 ::= SEQUENCE { [...] sl-PRS-ResourcesDedicatedSL-PRS-RP-r18 SEQUENCE (SIZE (1..12)) SL-PRS-ResourceDedicatedSL-PRS-RP-r18 OPTIONAL, -- Need M |

 Reason why the IE *SL-PRS-ResourceDedicatedSL-PRS-RP-r18* should correspond to one (rather than multiple) SL PRS resource: - Fields in *SL-PRS-ResourceDedicatedSL-PRS-RP-r18*: sl-PRS-ResourceID, sl-CombSize, sl-PRS-comb-offset, sl-PRS-starting-symbol, sl-NumberOfSymbols.- Each SL PRS resource is associated with a SL PRS resource ID, a comb-size, a comb-offset, a starting symbol, and a number of symbols, as can be found in the endorsed CR to TS 38.214, R1-2310764,

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| 8.2.4 SL PRS transmission procedureThe following parameters for SL PRS transmission are associated with each SL PRS resource:- [*SL PRS resource ID*] indicates an identity of a SL PRS resource. The SL PRS resource is identified by the SL PRS resource ID that is unique within a slot of a dedicated SL PRS resource pool. For a shared SL PRS resource pool, a SL PRS resource is uniquely identified by a combination of the SL PRS resource ID and a SL PRS frequency domain allocation within a slot indicated by “frequency resource assignment” field in the associated SCI.- [*SL PRS comb offset and comb size*] indicates a comb offset and a comb size of the SL PRS resource- [*Starting symbol and the number of SL PRS symbols*] indicates the starting symbol index and the number of symbols of the SL PRS resource within a slot in a dedicated SL PRS resource pool. [*number of SL PRS symbols*] indicates the number of symbols of the SL PRS resource within a slot in a shared SL PRS resource pool. |

Reason why the field “*sl-PRS-ResourcesDedicatedSL-PRS-RP-r18*” should correspond to “a sequence of” *SL-PRS-ResourceDedicatedSL-PRS-RP-r18*:- As captured in the endorsed CR to TS 38.212, R1-2310744, “*sl-PRS-ResourcesDedicatedSL-PRS-RP-r18*” is used to configure a number () of SL PRS resources in a slot of a dedicated SL PRS resource pool.

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| 8.3.1.2 SCI format 1-B[...]- Resource ID indication –bits when the value of the higher layer parameter *sl-MaxNumPerReserve-Dedicated-SL-PRS-RP*  is configured to 2; otherwise bits when the value of the higher layer parameter *sl-MaxNumPerReserve-Dedicated-SL-PRS-RP* is configured to 3. The value is the total number of SL PRS resources within a slot in a dedicated SL PRS resource pool and provided by the higher layer parameter *sl-PrsResources-Dedicated-SL-PRS-RP*. |

 Reason for 1..12:

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| RAN1#114bis AgreementThe maximum number of SL PRS resources that can be (pre)configured in a slot of a dedicated resource pool is 12. |

 Rapporteur: Thanks; this has been addressed in new version. |
| ZTE | Delete sl-PRS-TxPoolExceptional-r18. no agreement is made regarding whether exceptional pool should be used for SL-PRS in both R1 and R2Rapporteur: In last meeting, it was agreed to follow legacy approach; i.e there will be pool exceptional. Since legacy pool may not be applicable to transmit SL-PRS; the pool should be configured to be allowed to transmit SL-PRS; hence the exceptional pool should also be new pool.But we are fine to add this as an FFS. |
| ZTE | Delete the following field description since there is no corresponding ASN.1 IE***sl-TxParameters***Indicates PSSCH transmission parameters.Rapporteur: Thanks; this has been addressed in new version. |
| ZTE |

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| SL PRS in a shared resource pool | sl-TriggerConditionRequest | Existing | Update to the current description in 38.331:Indicates the trigger condition of an explicit request from UE-B to UE-A for transmission in a shared SL PRS resource pool. Value 0 means the explicit request is triggered by UE-B's implementation. Value 1 means the explicit request can be triggered only when UE-B has data or SL PRS to be transmitted to UE-A. | INTEGER (0 .. 1) | Per shared SL PRS RP |

For the legacy IE sl-TriggerConditionRequest-r17, field description should be added according to above R1 parameter list;And, sl-TriggerConditionRequest-r18 in SL-ResourcePool should be deletedRapporteur: Thanks; this IE has been updated and the IE with -r18 deleted in new version. |
| ZTE | SL-PRS-ResourcePool-r18 ::= SEQUENCE { sl-PRS-PSCCH-Config-r18 SetupRelease { SL-PSCCH-ConfigDedicatedSL-PRS-RP-r18} OPTIONAL, -- Need M sl-StartRB-SubchannelDedicatedSL-PRS-RP-r18 INTEGER (0..265) OPTIONAL, -- Need M sl-RB-Number-r18 INTEGER (10..275) OPTIONAL, -- Need M sl-TimeResource-r18 BIT STRING (SIZE (10..160)) OPTIONAL, -- Need M sl-PosAllowedResourceSelectionConfig-r18 ENUMERATED {c1, c2, c3} OPTIONAL, -- Need M sl-PRS-ResourceReservePeriodList-r18 SEQUENCE (SIZE (1..16)) OF SL-ReservationPeriodAllowedDedicatedSL-PRS-RP-r18 OPTIONAL, sl-PRS-SequenceID-r18 INTEGER (0..4095) OPTIONAL, -- Need M sl-PRS-ResourcesDedicatedSL-PRS-RP-r18 SL-PRS-ResourcesDedicatedSL-PRS-RP-r18 OPTIONAL, -- Need M sl-PRS-PowerControl-r18 SL-PRS-PowerControl-r18 OPTIONAL, -- Need M  sl-SensingWindowDedicatedSL-PRS-RP-r18 ENUMERATED {ms100, ms1100} OPTIONAL, -- Need M sl-TxPercentageDedicatedSL-PRS-RP-List-r18 SEQUENCE (SIZE (8)) OF SL-TxPercentageDedicatedSL-PRS-RP-Config-r18 OPTIONAL, -- Need M sl-SCI-basedSL-PRS-TxTriggerSCI1-B-r18 BOOLEAN OPTIONAL, -- Need M sl-NumSubchannelDedicatedSL-PRS-RP-r18 INTEGER (1..27) OPTIONAL, -- Need M sl-SubchannelSizeDedicatedSL-PRS-RP-r18 ENUMERATED {n10, n12, n15, n20, n25, n50, n75, n100} OPTIONAL, -- Need M sl-MaxNumPerReserveDedicatedSL-PRS-RP-r18 ENUMERATED {n2, n3} OPTIONAL, -- Need M sl-NumReservedBitsSCI1B-DedicatedSL-PRS-RP-r18 INTEGER (0..20) OPTIONAL, -- Need M sl-SRC-ID-LenDedicatedSL-PRS-RP-r18 ENUMERATED {n12, n24} OPTIONAL, -- Need M sl-CBR-PriorityTxConfigDedicatedSL-PRS-RP-List-r18 SEQUENCE (SIZE (1..8)) OF SL-PriorityTxConfigIndexDedicatedSL-PRS-RP-r18 OPTIONAL, -- Need M sl-TimeWindowSizeCBR-DedicatedSL-PRS-RP-r18 ENUMERATED {ms100, slot100} OPTIONAL, -- Need M sl-TimeWindowSizeCR-DedicatedSL-PRS-RP-r18 ENUMERATED {ms1000, slot1000} OPTIONAL, -- Need M sl-DefaultTxConfigIndexDedicatedSL-PRS-RP-r18 INTEGER (0..maxCBR-LevelDedSL-PRS-1-r18) OPTIONAL, -- Need M sl-CBR-ConfigIndexDedicatedSL-PRS-RP-r18 INTEGER (0..maxCBR-ConfigDedSL-PRS-1-r18) OPTIONAL, -- Need M sl-PRS-TxConfigIndexList-r18 SEQUENCE (SIZE (1.. maxCBR-LevelDedSL-PRS-1-r18)) OF SL-PRS-TxConfigIndex-r18 OPTIONAL, -- Need M sl-CBR-CommonTxDedicatedSL-PRS-RP-List-r18 SL-CBR-CommonTxDedicatedSL-PRS-RP-List-r18 OPTIONAL, -- Need M sl-PriorityThreshold-UL-URLLC-r18 INTEGER (1..9) OPTIONAL, -- Need M sl-PriorityThreshold-r18 INTEGER (1..9) OPTIONAL -- Need M}SL-PriorityTxConfigIndexDedicatedSL-PRS-RP-r18 ::= SEQUENCE { sl-PriorityThresholdDedicatedSL-PRS-RP-r18 INTEGER (1..8) OPTIONAL, -- Need M sl-TxConfigIndexDedicatedSL-PRS-RP-r18 INTEGER (0..maxCBR-LevelDedSL-PRS-1-r18) OPTIONAL, -- Need M sl-CBR-ConfigIndexDedicatedSL-PRS-RP-r18 INTEGER (0..maxCBR-ConfigDedSL-PRS-1-r18) OPTIONAL -- Need M} Green part should be deleted, yellow part should be moved to SL-PriorityTxConfigIndexDedicatedSL-PRS-RP-r18Rapporteur: Thanks! We have corrected and updated in the new version.  |
| Huawei, HiSilcion | * In 5.5.3.1: “2> if the UE is in RRC\_IDLE or in RRC\_INACTIVE”  and  “2> if the UE is in RRC\_CONNECTED”

Rapporteur: Thanks. This is fixed in the new version.* In UAI related part, 5.7.4.2 and ASN.1, priority is included in UAI for UE to request periodic SL grant configuration, but RAN2 only agreed to include priority in MAC CE for aperiodic SL-PRS transmission.

Rapp: Ok; we can mark this as FFS. --Editor’s Note: sl-PRS-Priority is FFS* For the SL-PRS resource configuration in the shared RP, it should contain a list of SL-PRS resource configurations, so that SCI should indicate the scheduled/reserved one. Similarly, for the SL-PRS resource configuration in the dedicated RP, it should also contain a list of SL-PRS resource configurations.

Rapporteur: Thanks; this has been addressed in new version.* Has RAN1 agreed on exceptional pool for SL PRS or what is the use for this exceptional pool? The same comment also applies for the part with CBR measurements

Rapporteur: In last meeting, it was agreed to follow legacy approach; i.e there will be pool exceptional. Since legacy pool may not be applicable to transmit SL-PRS; the pool should be configured to be allowed to transmit SL-PRS; hence the exceptional pool should also be new pool.But we are fine to add this as an FFS.* We have already agreed that SL positioning will not be configured for MR-DC. So, SRB1 should be fine. The note can be removed

Rapporteur: Thanks. The EN is removed in the new version.* Partial sensing is not supported on dedicated resource pool

.Rapporteur: Thanks. “partial” sensing is removed for SL positioning in the new version.* There is only a single 1> bullet. All the procedure in this section can be moved up one level

Rapporteur: Ok; lets not spend so much time on cosmetic; we can fix those later too. the architecture of the procedure for 5.8.7 Sidelink communication reception is the same with single 1> bullet, the current structure is clear and crispy, so for now we keep the current format. * Although I understand the sentence below is mostly borrowed from the legacy, I would suggest to reformulate the wording because it is currently broken sentence and hard to read

Rapporteur: yes, we want to align with the presenting style with the legacy. The current version is a good way though maybe not best way of clear description. We are open for discussion if companies come with better description. * In addition to priority, SL-PRS delay budget should also be added in the UAI

SL-PRS-UE-AssistanceInformationNR-r18 ::= SEQUENCE (SIZE (1..maxNrofSL-PRS-TxConfig-r18)) OF SL-PRS-TxInfo-r18SL-PRS-TxInfo-r18 ::= SEQUENCE { sl-PRS-Periodicity-r18 ENUMERATED {ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000, spare6, spare5, spare4, spare3, spare2, spare1}, sl-PRS-Priority-r18 INTEGER (1..8) OPTIONAL}* Rapporteur: Ok this has been added; but an FFS has been also added so we can double check on both priority and PRS delay budget and field description.
* There is no agreement yet whether the new SIB needs segmentation. If the size of the SIB can be larger than 2976 bits, segmentation is needed

Rapporteur: ok! We delete the segmentation.* In search space config, the new DCI formats need to be added. Although this should actually come from RAN1. ;]
* Rapp: we can add it next meeting. I do not see the format type yet.

* -r18 is missing

Rapporteur: Thanks. This is fixed in the new version.* Imported fields should be added

Rapp: since there is no compilation error and we extend from the -r16 version; it appears fine. |
| vivo | SL-PRS Sidelink Positioning Reference SignalsRemove s, should be singular form.Rapporteur: Thanks. This is fixed in the new version. |
| vivo | 1> if all segments have been received:2> assemble *SIBXX-IEs* from the received segments;2> if *sl-FreqInfoList* is included in *sl-PosConfigCommonNR*:3> if configured to receive sidelink control information for SL-PRS measurement:4> use the resource pool(s) indicated by *sl-RxPool* and/or *sl-PRS-RxPool* for sidelink control information reception for SL-PRS , as specified in 5.8.X.2;3> if configured to transmit SL-PRS:4> use the resource pool(s) indicated by *sl-TxPoolSelectedNormal*, or *sl-TxPoolExceptional* for SL-PRS transmission, as specified in 5.8.X.3;4> perform CBR measurement on the transmission resource pool(s) indicated by *sl-TxPoolSelectedNormal* or *sl-TxPoolExceptional* for SL-PRS transmission, as specified in 5.5.3.1;4> use the synchronization configuration parameters for NR sidelink positioning on frequencies included in *sl-FreqInfoList*, as specified in 5.8.5;sl-PRS-TxPoolSelectedNormal seems missing for SL-PRS transmission.Rapporteur: Thanks. We have addressed this in the new version. |
| vivo | A UE capable of providing configured grant assistance information including SL-PRS transmission periodicity and priority for NR sidelink positioning in RRC\_CONNECTED may initiate the procedure.The detailed information within such configured grant assistance information is not discussed yet, while we assume that the basic characteristics should be included at least, such as the bandwidth. And priority needs further discussion.In general, this issue can be further discussed and left with EN.Rapporteur: Thanks. Editor’s Note: FFS the details of configured grant assistance information.  |
| vivo | 1> if configured to provide configured grant assistance information for NR sidelink communication or NR sidelinlk communication:Highlighted is typoRapporteur: Thanks. We have addressed this in the new version. |
| vivo | 5.8.3.2 InitiationA UE capable of NR sidelink communication or NR sidelink discovery or NR sidelink U2N relay operation or NR sielink positioning that is in RRC\_CONNECTED may initiate the procedure to indicate it is (interested in) receiving or transmitting NR sidelink communication or NR sidelink discovery or NR sidelink U2N relay operation or SL-PRS transmission/reception in several cases including upon successful connection establishment or resuming, upon change of interest, upon changing QoS profile(s), upon receiving *UECapabilityInformationSidelink* from the associated peer UE, upon RLC mode information updated from the associated peer UE or upon change to a PCell providing *SIB12* including *sl-ConfigCommonNR*.Add the description of the new SIB, i.e., ‘or upon change to a PCell providing SIBxx including sl-PosConfigCommonNR.’ Besides, the new SIBXX needs to be added in Figure 5.8.3.1-1.Rapporteur: Thanks. We have addressed this in the new version. |
| vivo | These fields are included wrongly in the *SL-TxResourceReq* field descriptions, and should be in SidelinkUEinformationNR field descriptions

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| ***sl-PosRxInterestedFreqList***Indicates the index of frequency on which the UE is interested to receive NR sidelink positioning. The value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in *SIBXX*, the value 2 corresponds to the frequency of second entry in *sl-FreqInfoList* broadcast in *SIBXX* and so on. In this release, only value 1 can be included in the interested frequency list. |
| ***sl-PosTxResourceReqList***List of parameters to request the transmission resources for NR sidelink positioning for the associated destination.Rapporteur: Thanks. We have addressed this in the new version. |

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| vivo | if configured to receive sidelink control information for SL-PRS measurementhighlighted should be SL-PRS, i.e., if configured to receive SL-PRSRapp: technically data is received whereas SL-PRS is measured; so above formulation is also ok; but we can change if majority prefer to change. For now lets keep it as it is. |
| vivo | 5.3.13.2 InitiationThe UE initiates the procedure when upper layers or AS (when responding to RAN paging, upon triggering RNA updates while the UE is in RRC\_INACTIVE, for NR sidelink communication/discovery/V2X sidelink communication as specified in clause 5.3.13.1a, for requesting configuration for SRS for positioning, for activation of preconfigured Positioning SRS in RRC\_INACTIVE)Add ‘for NR sidelink positioning as specified in clause 5.3.13.1c’Rapporteur: Thanks. We have addressed this in the new version. |
| vivo | 2> if the *sl-RS-Type* within *sl-ReportConfig* is set to *sl-prs*:3> set *sl-Result-SL-PRS* within *sl-MeasResult* to include the NR SL-PRS based quantity indicated in the *sl-ReportQuantity* within the concerned *sl-ReportConfig*;SL-PRS is for SL positioning only and no need to change the measurement via SL-RRCRapp: this is based upon RAN1 agreement for OLPC. |
| vivo | SL-BWP-PRS-PoolConfigCommon-r18 ::= SEQUENCE { sl-PRS-RxPool-r18 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-PRS-ResourcePool-r18 OPTIONAL, -- Need R sl-PRS-TxPoolSelectedNormal-r18 SEQUENCE (SIZE (1..maxNrofSL-PRS-TxPool-r18)) OF SL-PRS-ResourcePoolConfig-r18 OPTIONAL, -- Need R sl-PRS-TxPoolExceptional-r18 SL-PRS-ResourcePoolConfig-r18 OPTIONAL, -- Need R ...}Whether dedicated RP includes exceptional pool should be FFS.Rapp: yes FFS has been added. |
| vivo | The IE SL-CBR-CommonTxConfigListtDedicated-SL-PRS-RP indicates theTypo, duplicated ttRapporteur: Thanks. We have addressed this in the new version. |
| vivo | ***sl-TxParameters***Indicates PSSCH transmission parameters.No PSSCHRapporteur: Thanks; this has been addressed in new version. |
| vivo | SL-PRS-ResourcePool-r18 ::= SEQUENCE { sl-PRS-PSCCH-Config-r18 SetupRelease { SL-PSCCH-ConfigDedicatedSL-PRS-RP-r18} OPTIONAL, -- Need M sl-StartRB-SubchannelDedicatedSL-PRS-RP-r18 INTEGER (0..265) OPTIONAL, -- Need M sl-RB-Number-r18 INTEGER (10..275) OPTIONAL, -- Need M sl-TimeResource-r18 BIT STRING (SIZE (10..160)) OPTIONAL, -- Need M sl-PosAllowedResourceSelectionConfig-r18 ENUMERATED {c1, c2, c3} OPTIONAL, -- Need M sl-PRS-ResourceReservePeriodList-r18 SEQUENCE (SIZE (1..16)) OF SL-ReservationPeriodAllowedDedicatedSL-PRS-RP-r18 OPTIONAL, sl-PRS-SequenceID-r18 INTEGER (0..4095) OPTIONAL, -- Need M sl-PRS-ResourcesDedicatedSL-PRS-RP-r18 SL-PRS-ResourcesDedicatedSL-PRS-RP-r18 OPTIONAL, -- Need Mhighlighted: should be removed as no per-pool sequence ID in the configuration.highlighted: should be a list of resource, size is 1-12.Rapporteur: Thanks; this has been addressed in new version. |
| IDC | In RAN2#123bis meeting, RAN2 agreed regarding unicast SL-DRX operation.*“DRX and dedicated resource pool for PRS transmission should not be applied together. This does not preclude the NW configuration for dedicated RP to be configured together with DRX.”*Regarding SL-DRX operation, at least RRC field description is needed for this because SL-DRX and dedicated resource pool are configured in RRC layer.Rapp: yes below note has been added:NOTE: It is up to UE implementation to determine its desired sidelink DRX configurations for unicast communication. When UE transmits SL-PRS in dedicated SL-PRS resource pool, the sidelink DRX configuration is not applied. |
| IDC | In description for SL PRS dedicated resource pool, you should remove PSFCH part.Based on RAN1 agreement:**agreement**PSFCH is not included in dedicated resource pool for SL positioning.*SL-BWP-PRS-PoolConfig*The IE *SL-BWP-PRS-PoolConfig* is used to configure UE specific NR sidelink PRS dedicated resource pool.Editor’s Note: FFS If *sl-PRS-TxPoolExceptional* is used for SL positioning.

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| ***SL-BWP-PRSPoolConfig* field descriptions** |
| ***sl-PRS-TxPoolSelectedNormal***Indicates the resources by which the UE is allowed to perform SL-PRS transmission by UE autonomous resource selection on the configured BWP. |
| ***sl-PRS-TxPoolScheduling***Indicates the resources by which the UE is allowed to perform SL-PRS transmission based on network selection on the configured BWP. |
| ***sl-PRS-TxPoolExceptional***Indicates the resources by which the UE is allowed to perform SL-PRS transmission in exceptional conditions on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |

Rapporteur: Thanks; this has been addressed in new version. |

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# Conclusion

In the previous sections we made the following observations:

Based on the discussion in the previous sections we propose the following:

# References