**3GPP TSG-RAN WG3 #116 R3-223694R3-215701**

E-meeting, 9-19th, May, 2022

Agenda Item: 9.1.8.1

Source: CMCC (moderator)

Title: Summary of offline discussion on Sidelink relay Corrections

Document for: Discussion

# Introduction

This contribution provides the summary of the following email discussion,

**CB: # SR1\_Corrections**

**- Whether to configure Uu RLC channel in UE CONTEXT SETUP procedure of Relay UE?**

**- Correction for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE, to define a new IE or to change ASN.1? Whether to modify the definition for NR UE Sidelink Aggregate Maximum Bit Rate IE in NG/Xn/F1?**

**- The definition of PC5 RLC channel ID, per remote UE or per relay UE? The value of maxnoofPC5RLCChannels?**

**- Whether to add a container pointing to SL-PathSwitchConfig in Path Switch Configuration IE?**

**- Whether to add PC5 low layer configuration IE in DU to CU RRC Information IE?**

**- Check other stage2/3 details**

**- Capture agreements and provide CRs if agreeable**

(CMCC - moderator)

Summary of offline disc R3-223694

Phase 1: To collect views on the proposals and try to make agreements. Please provide your feedback by **23:59 UTC Thursday May 12th  to leave more time for CRs**

Phase 2: Work split among companies and work on CRs

# For the Chairman’s Notes

Propose to capture the following: [TBD]

# Discussion

##  Correction for TS 38.413 and TS 38.423

###  ASN.1 and tabular misalignment issue

Contribution [5] and [6] point out the misalignment between ASN.1 and tabular and suggest define a new IE instead of referencing to IE “NR UE Sidelink Aggregate Maximum Bit Rate” 9.3.1.148 to avoid that misalignment.

**Question 1: Do companies support to define a new IE for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE as [5] and [6]?**

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| --- | --- |
| Company | Comments |
| Nokia | Yes. |
| ZTE | For 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE, the ASN.1 and tabular keep alignment in TS 38.473. To resolve the misalignment issue in TS 38.413/423, the simplest way is to follow TS 38.473, i.e. change the name to refer to NR UE SL AMBR and remove the FiveG-ProSeUEPC5AggregateMaximumBitrate IE in ASN.1. { ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }  |
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###  Editorial corrections

There are still some editorial and minor corrections proposed in [3] and [9], we will not discuss these editorial corrections on by one, but **those corrections can be taken into account when we work on the CRs in phase2.**

## Correction for TS 38.473

### SL-PathSwitchConfig

As described in contribution [7], there are two explicit IEs, i.e., Target Relay UE ID, and Txxxx (should be T420 as defined in TS 38.331) in the Path Switch Configuration and they have been defined as SL-PathSwitchConfig in TS 38.331. Contribution [7] thinks that such information can be directly transferred from the gNB-CU to gNB-DU then to the UE in the RRC container instead of explicit signaling over F1. The corresponding change is adding a container pointing to SL-PathSwitchConfig,and remove the Target Relay UE ID and Txxxx IEs.

**Question 2: Do companies agree to add a container pointing to SL-PathSwitchConfig in Path Switch Configuration IE?**

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| --- | --- |
| Company | Comments |
| Nokia | what is the issue for current spec?  |
| ZTE | Use a container seems more clean. We are fine with majority view. |
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###  PC5 low layer configuration IE

As mentioned in contribution [11], according to TS38.331, the sidelink configuration is provided by sl-ConfigDedicatedNR-r17 IE, which contains:



The highlighted part is referring to lower layer configuration provided by gNB-DU. However, currently, the gNB-DU only provides the SL-PHY-MAC-RLC-Config IE. Contribution [11] suggests adding PC5 low layer configuration IE in DU to CU RRC Information IE.

**Question 3: Do companies agree to add PC5 low layer configuration IE in DU to CU RRC Information IE?**

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| --- | --- |
| Company | Comments |
| Nokia | agree |
| ZTE | Agree that gNB-DU shall provide sl-RLC-ChannelToAddModList to gNB-CU, which is missing in the current spec.But for sl-DiscConfig which includes thresholds for discovery for Remote/Relay UE is not provided by gNB-DU but configured by CU as previous agreements. If the intention is for the dedicated resource pool for discovery, it is included in SL-PHY-MAC-RLC-Config IE (SL-PHY-MAC-RLC-Config -> sl-FreqInfoToAddModList -> sl-BWP-ToAddModList -> sl-BWP-DiscPoolConfig). Therefore, we think only PC5 RLC Channel Configuration (including sl-RLC-ChannelToAddModList) needs to add in DU to CU RRC Information IE.* gNB-CU’s responsibility:
	+ Local Remote UE ID allocation
	+ Remote UE and relay UE association and context maintenance
	+ Remote UE bearer mapping and multiplexing
	+ Relaying Uu/PC5 RLC channel management
	+ E2E QoS split management for relaying
	+ Dedicated thresholds for relay discovery
* gNB-DU’s responsibility
	+ Uu adaptation layer (AL) support for CP/UP data
	+ Determine the RLC/MAC/PHY Configuration for the relaying Uu/PC5 RLC CHs of relay UE
	+ Dedicated resource pool for NR ProSe service (same as legacy)

SL-DiscConfig-r17::= SEQUENCE { sl-RelayUE-Config-r17 SetupRelease { SL-RelayUE-Config-r17} OPTIONAL, -- L2RelayUE sl-RemoteUE-Config-r17 SetupRelease { SL-RemoteUE-Config-r17} OPTIONAL -- L2RemoteUE}SL-RelayUE-Config-r17::= SEQUENCE { threshHighRelay-r17 RSRP-Range OPTIONAL, -- Need R threshLowRelay-r17 RSRP-Range OPTIONAL, -- Need R hystMaxRelay-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRelay hystMinRelay-r17 Hysteresis OPTIONAL -- Cond ThreshLowRelay}SL-RemoteUE-Config-r17::= SEQUENCE { threshHighRemote-r17 RSRP-Range OPTIONAL, -- Need R hystMaxRemote-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRemote sl-ReselectionConfig-r17 SL-ReselectionConfig-r17 OPTIONAL -- Need R}SL-ReselectionConfig-r17::= SEQUENCE { sl-RSRP-Thresh-r17 SL-RSRP-Range-r16 OPTIONAL, -- Need R sl-FilterCoefficient-RSRP-r17 FilterCoefficient OPTIONAL, -- Need R sl-HystMin-r17 Hysteresis OPTIONAL -- Need R} |
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###  maxnoofPC5RLCchannels

Contribution [4] [10] mention the explanation of maxnoofPC5RLCChannels in 9.2.2.7, three options are listed as following,

A: Maximum no. of SL RLC bearers allowed for L2 U2N relaying per Relay UE, [10]

B: Maximum no. of PC5 Relay RLC channels allowed for L2 U2N relaying per Remote UE or per Relay UE, [4]

C: No change

**Question 4: which option above is your preference?**

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| --- | --- |
| Company | Comments |
| Nokia | Prefer B.  |
| ZTE | 1. After further thinking, we think the maxnoofPC5RLCChannels shall be in the scope of Relay UE, which is used to count the total number of PC5 RLC channels across multiple Remote UEs connected to one Relay UE. While the PC5 RLC channel ID shall be per remote UE.

The value of maxnoofPC5RLCChannels shall be (no. Of PC5 RLC channel per Remote UE) \* (max no. Of Remote UE), i.e. 64 \* 256 = 16384.However, if maxnoofPC5RLCChannels supports both per Remote UE and per Relay UE, there may need two different values of maxnoofPC5RLCChannels (or two IE names to differentiate) for Remote UE and Relay UE respectively. For example, if maxnoofPC5RLCChannels is per Remote UE, the maxnoofPC5RLCChannels = 64. If it is per Relay UE, maxnoofPC5RLCChannels = 16384. This may lead more spec impacts.While if maxnoofPC5RLCChannels supports both per Remote UE and per Relay UE and maxnoofPC5RLCChannels = 64, it means Relay UE may serve at most 64 Remote UEs with only one PC5 RLC channel towards each Remote UE. It is not aligned with RAN2, i.e. Remote UE local ID is 8bits. |
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###  Miscellaneous corrections

Contribution [2] [4] [10][11] indicate some changes to align with other specifications. We list those changes as following:

A: change undefined timer to T420 [11]

B: change maxnoofPC5RLCChannels to 64 [2] [4]

C: Change “Uu RLC channel” and “PC5 RLC channel” to “Uu Relay RLC channel” and “PC5 Relay RLC channel” [4] [10]

D: the semantics of *Sidelink Configuration Container* IE should refer to sl-ConfigDedicatedNR-r17 IE [11]

E: Add procedure description of “5G ProSe Authorized”, “5G ProSe UE PC5 Aggregate Maximum Bit Rate”, “5G ProSe PC5 Link Aggregate Bit Rate”. [4]

F: Add procedure description of “Updated Remote UE Local ID”.

G: Remove Uu RLC channel related description and bear mapping in UE context setup procedure. [2]

*NOTE: For G, moderator think it is related to question 8 and will discuss it in question 8-2.*

**Question 5: Do companies agree the above changes?**

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| --- | --- |
| Company | Comments |
| Nokia | Agree with all. |
| ZTE | A, C, D, E, F are agreeable.B is related to the conclusion of Question-4. As comment in Q4, we think the value of maxnoofPC5RLCChannels is 16384, i.e. no need to change in tabular. But the ASN.1 shall be changed to keep align.For G, as moderator point out, it is related to Question 8-2. As our comments in Q 8-2, we think the change is not necessary. |
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###  Editorial corrections

There are still some editorial and minor corrections proposed in [2] [4] [7] [10] and [11], we will not discuss these editorial corrections on by one, but **those corrections can be taken into account when we work on the CRs in phase2.**

##  Correction for TS 38.401

###  Configuration of PC5/uu RLC channel

Contribution [9] clarifies that the bearer mapping configurations for Relay UE and Remote UE are different. The bearer mapping for Relay UE are between U2N Remote UE’s DRB/SRB(s) and PC5/Uu Relay RLC channel(s), while the bearer mapping for Remote UE are between U2N Remote UE’s DRB/SRB(s) and PC5 Relay RLC channel(s). The working procedures for Remote UE in TS 38.401, such as step 30 in clause 8.19.1 and step 24 in clause 8.19.2, step 20 in clause 8.19.3 are not correct. Contribution [1] understands those 3 working procedures is for relay UE only and remove remote UE related description.

**Question 6-1:** **Do companies agree that those 3 procedures is for both relay UE and remote UE?**

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| --- | --- |
| Company | Comments |
| Nokia | Agree that the bearer mapping is different for Relay and Remote. But 38.401 is RAN3 spec, and should focus on RAN3 related mapping configuration. So Prefer contribution [1]. |
| ZTE | As point out in [1], the configuration of PC5 RLC channels and bearer mapping for the transmission of U2N Remote UE’s SRB2 and DRBs is performed at step 25/26. Thus, step 30 could only performed for Relay UE. An additional step could be added for add/mod/release of PC5/Uu RLC channels if necessary. Generally, these 3 steps for both relay/remote UE or only for relay UE are OK. We slightly prefer the changes for the 3 steps in [1]. |
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**Question 6-2: If your answer is Yes for Q 6-1, do you agree the changes for the 3 procedures in contribution [9]?**

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| --- | --- |
| Company | Comments |
| ZTE | As our comments in Q 6-1, we slightly prefer the changes for the 3 steps in [1]. |
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Contribution [12] indicates that Step15 in 8.19.1 is used to prepare PC5 and uu RLC channel for SRB1. uu RLC channel is for Relay UE only and PC5 RLC channel is for both Remote UE and Relay UE. So, step15 should include the Remote UE behaviour, which is align with preparation of PC5 and uu RLC channel for DRBs and SRBs in step 30. For the above reasons, contribution [12] recommends adding Remote UE related description in step 15 in 8.19.1, step 13 in 8.19.2 and step 13 in 8.19.3 and removing NOTE about earlier performed fore step 15/13/13.

**Question 7-1: Do companies agree to add** **Remote UE related description in step 15 in 8.19.1, step 13 in 8.19.2 and step 13 in 8.19.3?**

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| --- | --- |
| Company | Comments |
| Nokia | agree |
| ZTE | For Remote UE, the PC5 RLC channel configuration for SRB1 is in step 14, so step 15 is only for Relay UE and no need to add remote UE related description. Not understand the logic why step 15 shall be aligned with step 30. Moreover, as comments in Q6-1, we prefer step 30 is only for Relay UE. Based on previous agreements, the configuration of Uu RLC channel for SRB1 at relay UE might be performed in relay UE initial context setup, so the NOTE shall be kept as it is. |
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**Question 7-2: If your answer is Yes for Q 7-1, do companies agree that change for step 15/13/13 in contribution [12]?**

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| --- | --- |
| Company | Comments |
| Nokia | agree |
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### Whether to configure uu RLC channel in UE CONTEXT SETUP procedure of Relay UE

In contribution [1], it clarifies that gNB establishes Uu RLC channel for remote UE only after receives SUI. It suggests to remove “During RRC connection establishment procedure of the U2N Relay UE, gNB may configure the U2N Relay UE with Uu RLC channel(s) for relaying of U2N Remote UE’s SRB0/1” in step 3.

The conclusion may also affect F1 changes, e.g. section 3.2.4

G: Remove Uu RLC channel related description and bear mapping in UE context setup procedure. [2]

**Question 8-1 : Do companies agree the change for step 3 in contribution [1]?**

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| --- | --- |
| Company | Comments |
| Nokia | Agree with the change for Step 3 in Contribution [1].  |
| ZTE | We disagree with the reason for the change in [1]. Relay UE could be configured with Uu Relay RLC channel before serving any remote UEs, in another word, gNB is able to configure Uu relay RLC channel for relay UE before receiving SUI, i.e. only configure Uu Relay RLC channel by *cellGroupConfig* but without *sl-L2RelayUEConfig.* After receiving SUI from Relay UE, gNB further configures the Relay UE with *sl-L2RelayUEConfig,* which includes remote UE L2 ID, remote UE local ID and bearer mapping. Remote UE L2 ID is used to notify Relay UE about the remote UE that will connect with the Relay UE and to identify the bearer mapping, it has no relation to Uu RLC channel configuration.CellGroupConfig ::= SEQUENCE {cellGroupId CellGroupId,...uu-Relay-RLC-ChannelToAddModList-r17 SEQUENCE (SIZE(1..maxUu-Relay-RLC-ChannelID-r17)) OF Uu-Relay-RLC-ChannelConfig-r17 OPTIONAL, -- Need N...}Therefore, we shall stick to the previous agreement. The change in [1] is not necessary.****The UE CONTEXT SETUP REQUEST message of relay UE can be used to request the setup of Uu RLC channel(s) for SRB0/SRB1, respectively.**** |
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**Question 8-2: if your answer is Yes for 8-1, do you agree to remove Uu RLC channel related description and bear mapping in UE context setup procedure as contribution [2]?**

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| --- | --- |
| Company | Comments |
| Nokia | Agree |
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### Editorial corrections

There are still some editorial and minor corrections proposed in [1]and [9], we will not discuss these editorial corrections on by one, but **those corrections can be taken into account when we work on the CRs in phase2.**

##  Others

## If any significant issue in CRs is ignored, companies can list it here.

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| Company | Comments |
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# Conclusion, Recommendations [if needed]

[TBD]

# References

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| --- | --- | --- | --- |
| 1 | [R3-223223](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223223.zip) | CR on TS38.401 for Rel-17 Sidelink Relay (CATT) | CR0209r, TS 38.401 v17.0.0, Rel-17, Cat. F |
| 2 | [R3-223224](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223224.zip) | CR on TS38.473 for Rel-17 Sidelink Relay (CATT) | CR0882r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 3 | [R3-223228](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223228.zip) | Corrections on NR SL Relay for 38.413 (ZTE) | CR0793r, TS 38.413 v17.0.0, Rel-17, Cat. F |
| 4 | [R3-223229](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223229.zip) | Miscellaneous corrections on NR SL Relay for 38.473 (ZTE) | CR0883r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 5 | [R3-223257](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223257.zip) | Corrections for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE (NGAP) (Nokia, Nokia Shanghai Bell) | CR0794r, TS 38.413 v17.0.0, Rel-17, Cat. F |
| 6 | [R3-223258](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223258.zip) | Corrections for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE (XnAP) (Nokia, Nokia Shanghai Bell) | CR0793r, TS 38.423 v17.0.0, Rel-17, Cat. F |
| 7 | [R3-223415](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223415.zip) | SL Relay corrections over F1 (Ericsson) | CR0918r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 8 | [R3-223416](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223416.zip) | Stage-2 corrections for SL Relay (Ericsson) | draftCR |
| 9 | [R3-223485](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223485.zip) | Corrections to SL relay (Huawei) | CR0219r, TS 38.401 v17.0.0, Rel-17, Cat. F |
| 10 | [R3-223486](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223486.zip) | Corrections for SL relay (Huawei) | CR0930r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 11 | [R3-223545](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223545.zip) | Correction on Rel-17 sidelink relay (F1AP) (Samsung) | CR0941r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 12 | [R3-223653](file:///D%3A%5C%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5C%5CTSGR3_116-e%5C%5CDocs%5C%5CR3-223653.zip) | CR to TS38.401 on R17 Sidelink Relay (CMCC) | CR0230r, TS 38.401 v17.0.0, Rel-17, Cat. F |