**3GPP TSG RAN WG2 Meeting #116bis-e R2-2201xxx
Electronic Meeting, 17th - 25th Jan 2022**

**Agenda item: 8.7.1**

**Source: CATT**

**Title: Summary [AT116bis-e][606][Relay] CT1 LS on discovery (CATT)**

**Document for: Discussion and Decision**

# Introduction

This is email discussion for below offline discussion:

 [AT116bis-e][606][Relay] CT1 LS on discovery (CATT)

      Scope: Discuss the LS in R2-2200062, determine any RAN2 spec impact, and draft a reply.

      Intended outcome: Approvable LS and report to Tuesday CB session on spec impact

      Deadline:  Monday 2022-01-24 1800 UTC

The above email discussion is divided in two phases:

* **Phase I:** Companies are invited to provide feedback on the questions of this email discussion by 20th Jan 18:00 UTC.
* **Phase II:** Rapporteur submits a summary and proposals based on the feedback with draft LS reply, and companies can comment on the summary and draft LS reply by 24th Jan 18:00 UTC.

# Discussion

CT1 has sent one LS stated their requirement in[1], it recorded that:

*During implementation of 5G ProSe in Stage 3, CT1 has agreed that after receiving discovery message or PC5-S signalling in AS layer in target UE, the AS layer should include an implementation-specific indication to ProSe layer along with received discovery message or PC5-S signalling in order to indicate the message is discovery message or PC5-S signalling message (see C1-216189). Otherwise, the ProSe layer has no idea how to differentiate the two message types. And discovery message type and PC5-S signalling message type are defined in clause 11.2.1 and clause 11.3.1, TS 24.554 v0.5.0 respectively.*

With the above information from CT1, the AS layer of Rx UE should include an indication to ProSe layer along with the received discovery message or PC5-S signalling. Without this indication, the ProSe layer can’t distinguish the two message type which will cause problem. According to the contributions [2][3][4], rapporteur thinks it is easy for RAN2 to converge on the below question.

**Question 1-1: Do you agree when receiving the discovery message or PC5-S singaling, UE should pass them to the upper layer along with an indication to indicate that the message is discovery message or PC5-S signalling? Please give your comments.**

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| **Companies** | **Yes/No** | **Comments for**  |
| OPPO | Yes |  |
| Qualcomm | Yes |  |
| vivo | Yes, but w/o a specified “indication” | We have already introduced SL-SRB4 specifically for discovery. Any message received from SL-SRB4 will be determined as a discovery message reception, whereas messages received from SL-SRB0/1/2 will be alternatively determined as PC-S signalling. With such dintinction, the AS will route the received message to the correponding protocol (i.e. ProSe protocol vs. PC5-S protocol). Also, note that CT1 indicates clearly that this is an “implementation-specific” indication, thus not actually requiring RAN2 to have any specified solution. Therefore, not any specified “indication” is needed in the Spec. We think such distinction can be fully left to UE implementation, or at most a NOTE like “For the reception on the SL-SRBs, the UE differentiates whether a received message is a PC5-S messsage or discovery message based on the SL-SRB from which it is received”.[Rapp] I share the same view that there is no need to specified for the detaied indication, because it is an “implementation-specific” indication. And I also agree the above green marked description.Let me further explain from my side, in the LS from CT1, its requirement is that :” *the AS layer should include an implementation-specific indication to ProSe layer along with received discovery message or PC5-S signalling in order to indicate the message is discovery message or PC5-S signalling message (see C1-216189). Otherwise, the ProSe layer has no idea how to differentiate the two message types*” And for the action part, it is stated that :” CT1 kindly asks RAN2 to take the above into account and implement the CT1’s requirements.”Hence, it is straight and easy way to what we proposed. Thanks. |
| Ericsson | No  | Share the same as vivo. at RX side, PC5-S and discovery are carried by different SRBs,  PC5-S uses SRB0-2, while discovery uses SRB4.Different SRB types will be served by different PDCP entities. RX UE can just deliver received SDUs to corresponding PDCP entities, which will be further delivered to upper layer. In the upper layer, there are different handlers or entities to take care of PC5-S and discovery.  Therefore, there is really nothing which needs to be captured in the spec. But, we are also open to capture a note in the specs, aiming to have a limited spec impact/change. [Rapp] you mean the correspoing handlers of entities can be used to distinguish whether the message is discovery message or PC5-S signalling(that’s to say, in ProSe layer, different entity is used to handle different signalling), is it the correct understanding? Thanks.Ericsson-> yes, that is correct. Since PDCP entity is different, therefore, AS layer is already able to differentiate different message types. In addition, I guess there is no similar note or text to defernite between other SRB types in the existing spec. But meanwhile, since this LS is based on CTI agreement, we are also fine to add a note in the spec. |
| MediaTek | Yes, but with comments | This indication should be UE internal indication. |
| Xiaomi | Yes |  |
| Lenovo | Yes |  |
| InterDigital | Yes | Upper layers is not aware of the nature of the different PDCP entities, so some indication is needed. |
| Samsung | Yes |  |
| Nokia | No | Technically an indication for differentiation of discovery message and PC5-S message is not needed, as both discovery and PC5-S signalling use different signalling bearers as explained by vivo and Ericsson. We do not see a need that RAN2 needs to specify anything in regard to this and RAN2 should aim to minimize specification impact for not needed issues. As a compromise we can accept a NOTE in the PDCP specification and leaving the “specification specific implementation” of the indication up to UE implementation. |
| Huawei, HiSilicon | No | We share the same view as vivo, Ericsson and Nokia. The remote UE and relay UE are able to differenciate discovery/PC5-S messages via the SRB#, whether there would be explict indication or not is left to UE implementation, we do not see the need to specify internal interface much between AS and upper layer as usual. And we also notice the wording used in CT1 LS is “should” rather than “shall” or “has to”, so it is not a mandatory requirement. If something has to be done, a Note is sufficient. |
| Sharp | Yes with comments | It is OK to add a NOTE to clarify. |
| ZTE | Yes |  |
| LG | Yes with comment | PC5-S and discovery message already have different bearer numbers. So, relay UE can differentiate which one is PC5-S or discovery message. There is no need to specify internal indications explicitly in RAN2.  |
| Apple | Yes |  |
| CATT | Yes |  |
| Intel | Yes |  |
| Philips | Yes |  |
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Assuming RAN2 agrees the above proposal, the next step is to discuss the RAN2 spec impact. In the LS, it is stated that the AS layer of Rx UE should include an indication to ProSe layer along with the received discovery message or PC5-S signalling. In [2] and [3], they all propose that PDCP spec is the right specification to capture the change.

**Question 1-2: If “Yes” is selected in Question 1-1, do companies agree to capture the change in PDCP spec? Please give your comments.**

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| **Companies** | **Yes/No** | **Comments** |
| OPPO | Yes | Since for both PC5-S signalling and discovery message, PDCP is the highest layer in AS stack. Therefore, PDCP is the right spec to capture the indication |
| Qualcomm | Yes | Same view as OPPO |
| vivo |  | Prefer doing nothing, but can accept a NOTE in RRC Spec (5.8.1 General), or Stage-2 Spec. |
| MediaTek | Yes | No strong view to add a NOTE to claify. |
| Xiaomi | Yes |  |
| Lenovo | Yes | Since this is important for functioning of Prose Layer, it can be specified |
| InterDigital | Yes |  |
| Samsung | Yes |  |
| Sharp | Yes | It is OK to add a NOTE. |
| ZTE | Yes |  |
| LG | Yes |  |
| Apple | Yes |  |
| CATT | Yes | Same view as OPPO |
| Intel | Yes |  |
| Philips | Yes |  |
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Assuming the above indication should be reflected in PDCP spec, the detailed spec impacts should be further discussed. In [3], it raised that considering in AS-layer, the PC5-S ignaling and discovery ignaling are carried via different LCH, i.e., SRB0/1/2 for PC5-S and SRB4 for discovery, i.e., differentiation can already be done via LCID, so no ambiguity between Tx and Rx side, and thus no need for normative work. But in [2], it raised that RAN2 should capture it in the normative text instead of using a NOTE. Considering it is a mandatory UE behavior, rapporteur thinks it is nature to capture it into normative text instead of using a NOTE.

**Question 1-3: If “Yes” is selected in Question 1-2, which option do companies prefer on how to capture the indication to upper layer? Please give your comments.**

* **Option 1: Using NOTE;**
* **Option 2: Using normative text;**
* **Option 3: Others (if any, please give the detailed description).**

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| **Companies** | **Option** | **Comments** |
| OPPO | Option 1 | Since the indication is past from UE’s AS layer towards its higher layer, which would be handled within UE internally. Therefore, a note would be enough. Detailed design can be up to UE implementation. |
| Qualcomm | Option 1 | Since CT1 has captured the indication in their spec, we think RAN2 only need to capture a NOTE with CT1 spec as reference. |
| Vivo |  | Prefer doing nothing, but can accept a NOTE in RRC Spec (5.8.1 General), or Stage-2 Spec. |
| MediaTek | Option 1 |  |
| Xiaomi | Option 1 |  |
| Lenovo | Option 1 | Seems sufficient. |
| InterDigital | Option 1 | Since this is internal UE implementation, a note is sufficient. |
| Samsung | Option 1 |  |
| Nokia | Option 1 |  |
| Sharp | Option 1 |  |
| ZTE | Option 1 |  |
| LG | Option 1 |  |
| Apple | Option 1 |  |
| CATT | Option 1 | We would like to follow the majority’s view. |
| Intel | Option 1 |  |
| Philips | Option 1 |  |
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**Question 1-4: If “Option 1(capture in NOTE)” is selected in Question 1-3, which option do companies prefer on the detailed way to capture the change? Please give your comments.**

* **Option 1: The NOTE can be added in TS 38.323 where the “SDU type” was specified with the content “The UE indicates to upper layer that the received message is for 5G ProSe direct discovery message(s) or for PC5-S message(s)”;**
* **Option 2: Others (if any, please give the detailed description).**

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| **Companies** | **Option** | **Comments** |
| OPPO | Option1 |  |
| Qualcomm | Option 1 | We can add a reference to CT1 spec in the NOTE. |
| Vivo | 2 | Prefer doing nothing, but can accept a NOTE like “For the reception on the SL-SRBs, the UE differentiates whether a received message is a PC5-S messsage or discovery message based on the SL-SRB from which it is received”. |
| MediaTek | 2 | Agree with vivo. |
| Xiaomi | Option 1 |  |
| Lenovo | Option 1 |  |
| InterDigital | Option 1 |  |
| Samsung | Option 2 | We prefer the proposed NOTE by vivo. |
| Nokia | Option 2 | Agree with vivo,MediaTek,Samsung |
| Huawei, HiSilicon | Option2 | Prefer the wording proposed by vivo. |
| Sharp | Option2 | Agree with vivo. |
| ZTE | Option 1 |  |
| LG | Option 2 | Agree with vivo |
| Apple | Option 1 |  |
| CATT | See comments | No strong view, it can be left to stage-3 discussion. |
| Intel | Option 1 | Agree with Qualcomm’s suggestion. Also, a question for clarification, did the rapporteur mean in section 6.3.12 or 5.2.4 or 6.2.2.4? |
| Philips | Option 1 |  |
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**Question 1-5: If “Option 2(capture in normative text)” is selected in Question 1-3, which option do companies prefer on the detailed way to capture the change? Please give your comments.**

* **Option 1: RAN2 agrees the TP in annex A to reflect the changes;**
* **Option 2: Others (if any, please give the detailed description).**

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| **Companies** | **Option** | **Comments** |
| vivo |  | Prefer doing nothing, but can accept a NOTE in RRC Spec (5.8.1 General), or Stage-2 Spec. |
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**Question 1-6: If “No (not capture the change in PDCP spec)” is selected in Question 1-2, please describe your detailed solution on how to capture the change.**

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| **Companies** | **Detailed solution description** |
| vivo | Prefer doing nothing, but can accept a NOTE in RRC Spec (5.8.1 General), or Stage-2 Spec. |
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# Conclusion

# References

1. R2-2200062 LS on the indication of discovery message and PC5-S signalling to ProSe layer (C1-217167; contact: CATT) CT1 LS in Rel-17 5G\_ProSe To:RAN2 Cc:SA2
2. R2-2200165 Indication of Discovery Message and PC5-S Signalling to ProSe Layer CATT discussion Rel-17 NR\_SL\_relay-Core
3. R2-2200366 Discussion on C1-217167 OPPO discussion Rel-17 NR\_SL\_relay-Core
4. R2-2200229 Discovery open aspects for U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

# Annex A Text proposals

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| START of TP for 38.323 |

### 5.2.4 Sidelink receive operation

For sidelink reception of the SLRB, the UE shall follow the procedures in clause 5.2.2 with following modification:

- perform the header decompression using ROHC as specified in clause 5.7.5, if SDU Type is IP.

-    When delivering the PDCP SDU to upper layer, if this PDCP SDU belongs to SL-SRB0/1/2, it should along with an indication to indicate it as PC5-S signalling.

-    When delivering the PDCP SDU to upper layer, if this PDCP SDU belongs to SL-SRB4, it should along with an indication to indicate it as discovery message.

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| END of TP |