3GPP TSG-RAN WG2 #110 e R2-20006182

**Online, 1st – 12th , June 2020**

Agenda Item: 6.4.3.2

Source: vivo

Title: Summary of NR V2X SDAP related contribution

Document for: Discussion, Decision

# Introduction

In this contribution, we aim at resolving SDAP open issues in R2-2005677 and update of TS 37.324 CR accordingly.

* [AT110-e][707][V2X] SDAP issues (Vivo)

Discuss and conclude SDAP issues in R2-2005677 and update agreeable SDAP CR accordingly (in R2-2005961).

Deadline is 6/9 10:00am (UTC).

# Discussion

## 2.1 Sidelink Link ID [1]

The contribution [1] proposed that SDAP entity can be configured either per destination L2 id and cast type or the unicast link ID in the UE in order to cover the case that there are same destination ID among multiple unicast link between a UE and an counterpart UE.

The issue arose in the RAN2#108 meeting. Same company [3] gave some observations about it is difficult to exactly distinguish PC5 unicast link based on Layer-2 ID pair (i.e., source layer-2 ID, destination layer-2 ID) information. Hence it is proposed upon PC5 RLC declaration, UE's AS layer should send PC5 RLF indication including PC5 unicast Link ID to both upper layer (i.e. V2X layer) and the network to indicate the PC5 unicast link whose RLF declaration was made and PC5-RRC connection was released.

However, after online discussion, the majority do not think it is worthy to have specification impacts to resolve the uniqueness issue of link ID on same destination ID, e.g. collision probability is very low. Finally, only sending Link ID to upper layer had been agreed as followings:

Agreements on SL RLF reporting:

1: Upon PC5 RLF declaration, UE's AS layer should send a PC5 RLF indication including PC5 Link Identifier to upper layer (i.e., V2X layer) to indicate the PC5 unicast link whose RLF declaration was made and PC5-RRC connection was released.

In general, most companies think it is a rare case that there are same destination ID among multiple unicast link between a UE and an counterpart UE. Hence any specification effort is not needed. Following majority's view is a reasonable way at the ending stage of Rel-16 V2X.

Hence Rapporteur proposes:

**Proposal 1: Unicast Link ID is not needed in SDAP configuration.**

**Question 1: Do companies agree with the above Proposal 1?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree or not** | **Comments if any** |
| Samsung | Agree | We share the view from Rapporteur |
| Ericsson | Agree |  |
| CATT | Agree |  |
| Qualcomm | Agree |  |
| Futurewei | Agree |  |
| Apple | Agree |  |
| ZTE | No | We think we shall consider the destination ID collision issue and do not just ignore the issue due to the collision probability is low. Since the PC5 Link ID uniquely identifying a PC5 unicast link is provided to AS layer, we can use it to resolve the issue. We can just use the PC5 Link ID to replace the destination ID/source-destination ID pair for unicast. |
| Lenovo | Agree |  |
| LG | No | Destination ID collision may be occurred in case there are multiple same destination ID among multiple unicast link between a UE and a counterpart UE. |
| MediaTek | Agree |  |

**Summary:**

Majority of companies think that, in case the scope of SDAP, there no need to consider destination ID collision that may occur in case there are multiple same destination ID among multiple unicast link between a UE and a counterpart UE.

**Proposal 1: Unicast Link ID is not needed in SDAP configuration.**

## 2.2 Establishment-release of the Rx SDAP entity [4]

Contribution [4] hightlighted, the following RAN2 agreements on SDAP:

|  |
| --- |
| **RAN2#107bis agreements:**   * For NR SL unicast Tx and Rx SDAP entity, both establishment and release are requested by upper layers (i.e., follow NR Uu as baseline). * For NR SL groupcast and broadcast Tx SDAP entity, both establishment and release are requested by upper layers (i.e., follow NR Uu as baseline).   **RAN2#108 agreements:**  SDAP Rx behaviour upon remapping is left to UE implementation for insequence delivery. And it will not be captured in the specification |

Based on above agreements, [4] made the foolwing observation: that

***“There is not clear agreement on the establishment and release of a Rx SDAP entity for NR SL groupcast and broadcast communication, but the establishment and release of a Rx SDAP entity for NR SL groupcast and broadcast communication is requested by RRC*”**

[4] further proposes:

**“*For NR SL groupcast and broadcast communication, Rx SDAP entity is established when receiving the first SDAP PDU from lower layer for a specific destination and there is not yet a corresponding Rx SDAP entity for the destination. The release of a Rx SDAP entity is up to UE implementation.* ”**

From our understanding, this issue has alredy been addressed without agreement during previous email summary discussion [5] as follows:

|  |
| --- |
| **Question 4-3: For NR SL groupcast and broadcast, which option is preferred to establish and release receiving SDAP entity?**   1. **Establishment upon reception of first PDU from a Source Layer 2 ID and Destination Layer 2 ID pair where there is not yet a corresponding receiving SDAP entity and release up to UE implementation** 2. **No need to specify procedures related to SDAP Rx entity.** 3. **Others, please specify** |

During online discussion, option a) was not agreed. Therefore, Rapporteur proposes**:**

**Proposal 2: RAN2 not to pursue the issue raised in [4].**

**Question 2: Do companies agree with the above Proposal 2?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree or not** | **Comments if any** |
| Samsung | Agree | We share the view from Rapporteur. |
| Ericsson | Agree |  |
| CATT | Agree |  |
| Qualcomm | Agree |  |
| Futurewei | Agree |  |
| Apple | Agree |  |
| ZTE | No | As rapp says that there is no agreement for this issue, so we need to further discuss this issue and make an agreement.  Since no PC5 RRC signalling is existed for groupcast and broadcast, and as previous agreement that Rx only SLRB parameters are up to UE implementation, it is not correct to say the establishment and release of a Rx SDAP entity is requested by RRC (as specified in current SDAP CR).  At least, we think an NOTE is needed to make clarification for Rx SDAP entity for groupcast/broadcast, otherwise people may misunderstand the Rx SDAP entity is requested by RRC based on the current SDAP CR. |
| Lenovo | Agree |  |
| LG | Agree |  |
| MediaTek | No | In [5], 9 companies select a) more than b) and c), at the end of R16 WI, we agree with ZTE, at least, a simple NOTE is needed. |

**Summary:**

Majority of companies agree that no discussion continue discussion on whether unicast Link ID is needed in SDAP configuration

**Proposal 2: RAN2 not to pursue the issue raised in [4].**

## 2.3 Clarification on SL terminology [2]

SL may include NR SL and V2X SL, so [2] suggests to make the specification description clear to avoid confusion between NR and V2X SL. For example in section 4.2.1 description “In SL communication, the SDAP sublayer maps PC5 QoS flows to SL-DRBs.”, “SL” refers to “NR SL”, which means that LTE V2X cannot use SDAP protocol:

|  |
| --- |
| In SL communication, the SDAP sublayer maps PC5 QoS flows to SL-DRBs. One or more PC5 QoS flows may be mapped onto one SL-DRB. One PC5 QoS flow is mapped onto only one SL-DRB at a time in the SL for transmission. |

Thus,

**Proposal 3: Update the specification description to change “SL” to “NR SL” to avoid LTE V2X using SDAP protocol.**

**Question 3: Do companies agree with the above Proposal 3?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree or not** | **Comments if any** |
| Samsung | Agree |  |
| Ericsson | Agree |  |
| CATT | Agree |  |
| Qualcomm | Agree |  |
| Futurewei | Agree |  |
| Apple | Agree | To align with stage 2 spec, we can use the full name “NR Sidelink” instead of “NR SL” |
| ZTE | Agree |  |
| Lenovo | Agree |  |
| LG | Agree |  |
| MediaTek | Agree |  |

**Summary:**

All companies agree to update the specification description to change “SL” to “NR SL” to avoid LTE V2X using SDAP protocol.

**Proposal 3: Update the specification description to change “SL” to “NR SL” to avoid LTE V2X using SDAP protocol.**

## 2.4 The interface for SL is PC5 [2]

The third issue raised by [2] is that sidelink is one of radio access technologies and PC5 is the radio interface related to sidelink, but the Figure 4.2.2-1 uses "Radio Interface (Uu/Sidelink)", which can be changed to "Radio Interface (Uu/PC5)" and consistent with other L2 protocol, e.g. RLC and PDCP. Thus,

**Proposal 4: Update Figure 4.2.2-1 to "Radio Interface (Uu/PC5)".**

**Question 4: Do companies agree with the above Proposal 5?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree or not** | **Comments if any** |
| Samsung | Agree |  |
| Ericsson | Agree |  |
| CATT | Agree |  |
| Futurewei | Agree |  |
| Apple | Agree |  |
| ZTE | Agree |  |
| Lenovo | Agree |  |
| LG | Agree |  |
| MediaTek | Agree |  |

**Summary:**

All companies agree to update Figure 4.2.2-1 to "Radio Interface (Uu/PC5)".

**Proposal 4: Update Figure 4.2.2-1 to "Radio Interface (Uu/PC5)".**

## 2.5 Unify cast description [2]

[2] also pointed out SDAP establishment and release procedure should not distinguish among unicast, groupcast and broadcast. Rapporteur agrees that there should not be such distinction inSection 5.1.1 and 5.1.2. thus,

**Proposal 5: Unify SDAP establishment and release procedure among unicast, groupcast and broadcast.**

**Question 5: Do companies agree with the above Proposal 5?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree or not** | **Comments if any** |
| Samsung | Agree |  |
| Ericsson | Agree |  |
| CATT | Agree |  |
| Qualcomm | Agree |  |
| Futurewei | Agree |  |
| Apple | Agree |  |
| ZTE | No | Same comments in Q2 |
| Lenovo | Agree |  |
| LG | Agree | LG |
| MediaTek | No | Same comments in Q2. |

**Summary:**

Majority of companies agree to unify SDAP establishment and release procedure among unicast, groupcast and broadcast Section 5.1.1 and section 5.1.2

**Proposal 5: Unify SDAP establishment and release procedure among unicast, groupcast and broadcast.**

## 2.6 More editorial issues

Besides the proposed editorials in [2], we summarize the following editorial update proposals for SDAP specification:

1. **Section 1:** In current the description, the SDAP document is only for a UE with connection to the 5G-CN. In fact, it is also for a UE in NR sidelink communication. So improvement to the scope the description is needed as follows:

“The present document specifies the Service Data Adaptation Protocol (SDAP) for a UE with connection to the 5G-CN or for a UE in NR Sidelink communication.”

1. **Section 4.2.1:** Replace “by” by “according to”:

“The SDAP sublayer is configured by RRC (TS 38.331 [3]) and for NR SL communication the SDAP can also be configured ~~by~~ according to SIB or pre-configured”

1. **Section 4.2.2:** Align Destination Layer-2 ID with TS 38.331:

The SDAP entities are located in the SDAP sublayer. Several SDAP entities may be defined for a UE. There is an SDAP entity configured for each individual PDU session. For SL, SDAP entity is configured per Destination Layer-2 ID ~~Identity~~ and cast type in the UE.

1. **Section 5.5.2:** Remove “or SIB” as this is already covered by “When RRC (TS 38.331)”:

When RRC (TS 38.331 [3]) ~~or SIB~~ indicates that an SL-DRB is released, the SDAP entity shall:

1. **Section 6.2.2.4:** Align text description with section title:

In the sentence of "Figure 6.2.2.4–1 shows the format of SDAP Data PDU of unicast of NR SL communication with SDAP header being configured ", "of unicast" needs to be changed to "for unicast" to align with the title as:

“Figure 6.2.2.4–1 shows the format of SDAP Data PDU ~~of~~ for unicast of NR SL communication with SDAP header being configured.”

**Question 6: Do companies agree with the above editorial changes 1)- 5) ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree or not** | **Comments if any** |
| Samsung | Agree |  |
| Ericsson | Agree |  |
| CATT | Agree |  |
| Futurewei | Agree | Taking the same approach of 4), 2) can also be simplified as “The SDAP sublayer is configured by RRC (TS 38.331 [3]) ~~and for NR SL communication the SDAP can also be configured by according to SIB or pre-configured~~ .” as SIB and pre-configured are also defined in TS 38.331. |
| Apple | Agree |  |
| ZTE | Agree |  |
| Lenovo | Agree |  |
| LG | Agree |  |
| MediaTek | Agree |  |

**Summary:**

All companies agree to editorial proposed above, with additional enhancement proposed by specification Rapporteur.

**Proposal 6: Capture the editorials proposed in this SDAP contribution summary.**

# Conclusion

The summary on SDAP concludes with the following:

**Proposal 1: Unicast Link ID is not needed in SDAP configuration.**

**Proposal 2: RAN2 not to pursue the issue raised in [4].**

**Proposal 3: Update the specification description to change “SL” to “NR SL” to avoid LTE V2X using SDAP protocol.**

**Proposal 4: Update Figure 4.2.2-1 to "Radio Interface (Uu/PC5)".**

**Proposal 5: Unify SDAP establishment and release procedure among unicast, groupcast and broadcast.**

**Proposal 6: Capture the editorials proposed in this SDAP contribution summary.**

# References

1. R2-2002861 Left issue on SDAP for NR V2X, LG Electronics France
2. R2-2003113 Editorial modification for NR sidelink, Ericsson
3. R2-1915514 Remaining issues on SL RLF reporting, LG Electronics Inc
4. R2-2004581 Discussion on the establishment-release of the Rx SDAP entity, ZTE Corporation, Sanechips
5. R2-1913948 Report of 107#73 NR V2X SDAP(vivo), vivo