**3GPP TSG-RAN2 #117-e R2-220xxxx**

Electronic Meeting, 21st February– 3rd March, 2022

**Agenda item: 8.15.2**

**Source: ZTE**

**Title: Summary of [713]**

**Document for: Discussion and decision**

# Introduction

This is for the discussion of the following:

[POST117-e][713][V2X/SL] LS to SA2 (ZTE)

**Scope:** Prepare LS to SA2 (including the questions above)

**Intended outcome:** Approve LS in R2-2203693

**Deadline:** Short email discussion

Recommendation 2.2-1a [13/17]: (modified) Check with SA2 whether a same L2 ID may associate with multiple Tx profiles, and thus may associate with both DRX-based Tx profile and non-DRX based Tx profile in Rel-16. Then also check with SA2 if feasible for Rel-17 SL DRX operation, L2 id is only associated with either DRX-based TX profile(s) or non-DRX based TX profile(s).

* Agreed.
* DCR issue raised by ZTE can be discussed as part of LS preparation. If the question is valid to companies, we’re also adding that question otherwise we’re not adding it.
* Working assumption: no additional RAN2 work if SA2 confirms it’s feasible for Rel-17 SL DRX operation, L2 id is only associated with either DRX-based TX profile(s) or non-DRX based TX profile(s).

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# Discussion

According to previous agreement on TX profiles as below, TX profile is introduced for GC/BC to solve backward compatibility issue of SL DRX. But for unicast, considering that backward compatibility can be handled based on PC5-RRC UE capability ignaling, so no TX profiles is introduced for unicast.

Agreements on TX profiles:

1: For GC/BC, TX profile is introduced in Rel-17 for sidelink enhancement. FFS whether a TX profile identifies a Release, or one or more sidelink feature groups.

2: RAN2 understand a service type can be mapped to a TX profile, i.e. V2X and ProSe.

3: A TX profile is indicated from upper layer to AS layer. FFS whether a TX profile needs to be provided with service type information or L2 id.

4: For GC/BC, a Rel-17 TX UE shall only assume SL DRX for the RX Ues when the associated TX profile corresponding to support of SL DRX. FFS whether a TX profile needs to be provided with service type information or L2 id.

5: For GC/BC only communication, a Rel-17 RX UE determines SL DRX is used if all service types/L2 ids of interest have an associated TX profile corresponding to support of SL DRX. A Rel-17 RX UE enables SL DRX operation for a service type/L2 id with the associated TX profile.

6: For UC, for SL transmissions after PC5-RRC connection is established, no backward compatibility issue of SL DRX is assumed, i.e. backward compatibility is handled based on PC5-RRC UE capability signalling.

7: Send an LS to SA2 to inform them of the RAN2 agreements related to TX profile.

8: The Tx profile should include at least the information of DRX support or not.

However, as we know, it is agreed that *the default SL DRX configuration for BC/GC can be used for the DCR message*. But the DCR message is sent and received before PC5-RRC UE capability ignaling, so the backward compatibility of DCR can not be handled based on PC5-RRC UE capability ignaling.

According to our understanding, if the RX UE cannot know whether the intended TX UE may be Rel-16 UE that does not support SL DRX, it cannot know whether default SL DRX configuration can be used when receiving the DCR message. Similarly, if the TX UE cannot know whether the intended RX UE may be Rel-16 UE that does not support SL DRX, it cannot know whether default SL DRX configuration shall be used when sending the DCR message.

In addition, according to running CR TS 38.300, there is an editor note:

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| *Whether the default configuration is used when sending the initial message in unicast needs further discussion.* |

Similarly, the Rapp think whether the default configuration is used when receiving the initial message in unicast also needs further discussion.

**Q1: Do you agree we need to discuss whether the default configuration can be used when receiving the DCR message in unicast? If the answer is no, please share your comment on why it is not needed.**

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| Company | Yes/No | comments |
| OPPO | No | This has been agreed in this RAN2 meeting as follows, we don’t need to re-discuss this:  Recommendation 2.1.1-1 [15/15]: The default SL DRX configuration for BC/GC [(including at least DRX cycle, start offset and on-duration timer)] can be used for both BC-based and UC-based DCR message. |
| Ericsson | no | As OPPO indicated |
| Apple | No | It is agreed that default DRX configuration can be used for UC DRX for a Rel-17 UE. It is not backward-compatible with Rel-16 UE. |
| Vivo | No | No need to discuss, it was agreed. |
| Huawei, HiSilicon | No | Agree with OPPO |
| CATT | No | Agree with OPPO |
| Qualcomm | No | Agreed already as indicated by OPPO |

Considering Backward compatibility issue of DCR is similar like the back Backward compatibility issue of GC/BC, so the Rapp think a similar way of introducing TX profile can be used.

**Q2: Do you agree that a similar way of introducing TX profile can be used to determine whether default SL DRX configuration can be used when sending or receiving DCR message?**

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| Company | Yes/No | comments |
| OPPO | Yes |  |
| Ericsson | Yes |  |
| Apple | Yes |  |
| vivo | Yes |  |
| Huawei, HiSilicon | Yes |  |
| CATT | Yes |  |
| Qualcomm | Comment | No backward compatibility issue for sending DCR since both Rel 17 and Rel 16 UEs can receive it from a Rel 17 UE using the default SL DRX.  Only backward compatibility issue for receiving DCR, e.g., Rel 17 UE with default SL DRX may not receive Rel 16 UE’s DCR if out side of the active time of the default SL DRX. |















TX profile related description in 24.587 are listed as below:

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| 3) Policy/parameters for PC5 RAT selection and for PC5 Tx Profile selection:  - the mapping of V2X service types to PC5 RAT(s) (e.g. LTE PC5, NR PC5 or both), and:  - for LTE PC5, to the corresponding Tx Profiles (see TS 36.300 [9] for further information);  - for NR PC5, to the corresponding NR Tx Profiles for broadcast and groupcast (see TS 38.300 [11] and TS 38.331 [15] for further information). |

Thus, it seems that the same Destination Layer-2 ID may be mapped to more than one V2X service types with different Tx Profile, so we agreed to check with SA2 whether a same L2 ID only associated with either DRX-based TX profile(s) or non-DRX based TX profile(s).

But according to current 23.287, during the Procedure for Broadcast mode of V2X communication over PC5 reference point, it is described that:

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| The source Layer-2 ID, the destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of transmitting UE for the transmission.  The destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of receiving UE(s) for the reception. |

During the Procedure for groupcast mode of V2X communication over PC5 reference point, it is described that :

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| The source Layer-2 ID, destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of transmitting UE for the groupcast mode communication transmission.  The destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of receiving UE(s) for the groupcast mode communication reception. |

Therefore, it is clear that for TX UE, only one NR Tx Profile is associated with a pair of source Layer-2 ID and destination Layer-2 for broadcast and groupcast. And for RX UE, only one NR Tx Profile is associated with a destination Layer-2 for broadcast and groupcast. **That means the TX profile issue for GC/BC has been considered by SA2.**

However, for unicast, the Rapp find a note as below but cannot find any description of NR TX profile for DCR message are passing down to the AS layer. And the transmission of DCR message is described in the clause in unicast communication.

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| NOTE 4: The same default Destination Layer-2 ID for unicast initial signalling can be mapped to more than one V2X service types. In the case where different V2X services are mapped to distinct default Destination Layer-2 IDs, when the UE intends to establish a single unicast link that can be used for more than one V2X service types, the UE can select any of the default Destination Layer-2 IDs to use for the initial signalling. |

As we know, the TX profile is introduced by SA2 based on the previous LS from RAN2. In the previous LS, RAN2 only mensioned that the TX profile are needed for GC/BC. So it is not clear whether TX profile for DCR message are useful based on previous LS.

1: For GC/BC, TX profile is introduced in Rel-17 for sidelink enhancement. FFS whether a TX profile identifies a Release, or one or more sidelink feature groups.

For GC/BC only communication, a Rel-17 RX UE determines SL DRX is used if all service types/L2 ids of interest have an associated TX profile corresponding to support of SL DRX. A Rel-17 RX UE enables SL DRX operation for a service type/L2 id with the associated TX profile.

For UC, for SL transmissions after PC5-RRC connection is established, no backward compatibility issue of SL DRX is assumed, i.e. backward compatibility is handled based on PC5-RRC UE capability signalling.

**Observation1: Based on current SA2’s spec, The description of passing NR Tx profile to AS layer is only captured in clause of broadcast and groupcast communication, not in the clause of unicast. However, the transmission of DCR message is captured in the clause of unicast communication.**

**FYI, the CR for NR Tx profile in 23.287 is S2-2109103**

**Q3: Do you agree that current SA2’s spec only capture NR Tx profile for broadcast service and groupcast service?**

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| Company | Yes/No | comments |
| ZTE | Yes | The description of passing NR Tx profile to AS layer is only captured in clause of broadcast and groupcast, not in the clause of unicast. However, the transmission of DCR message is captured in clause of unicast communication. |
| Vivo | Yes | Agree with ZTE’s observation. They may not be aware of our agreement as indicated by OPPO in Q1. |
| Huawei, HiSilicon | Yes | The current SA2 spec only captures the broadcast and groupcast services. |
| CATT | Yes | Agree with ZTE observation. |
| Qualcomm | Yes | Since compatibility issue is only for groupcast and broadcast as indicated to SA2 previously. |

So the Rapp suggest to emphasize the NR Tx profile issue for DCR message in the LS. However, as a compromise, we add an option as below:

**Q4：If the answer of Q2 is yes, do you agree to add following Question into LS to SA2？Please note following sentence will be directly added into the LS, you can also provide your comments on the wording of following question.**

**Option 1: add an question 3 as below：**

**‘Is it feasible to indicate TX profile for DCR message and pass it to AS layer for Rel-17 UE?’**

**Option2: modify Question 1, i.e.**

**May a same L2 ID for GC/BC and default Destination Layer-2 ID for unicast initial signalling associate with multiple Tx profiles, and thus associate with both DRX-based Tx profile and non-DRX based Tx profile in Rel-16? RAN2 wants to know whether it is feasible for Rel-17 SL DRX operation that L2 id is only associated with either DRX-based TX profile(s) or non-DRX based TX profile(s).**

**Option 3： no need to check Tx profile issue for DCR. Inform following agreement to SA2:**

The default SL DRX configuration for BC/GC [(including at least DRX cycle, start offset and on-duration timer)] can be used for both BC-based and UC-based DCR message.

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| Company | Option | comments |
| OPPO | No | We do not think there is any doubt on that, we just need to indicate that the default DRX is applicable to UC-based DCR message, and thus S2 can apply the Tx profile for DCR, without differentiating BC and UC-based DCR. (note that the service ID is a field of both BC and UC-based DCR, so Tx profile definition can be applied without any trouble) |
| Ericsson | No | Agree with OPPO |
| Apple | No | This is feasible because TX profile is determined based on service and/or L2 address. For sure SA2 can support this just like the support of other Rel-17 SL traffic |
| ZTE | Option 2 | Based on current SA specification, it is clear that for GC/BC, only one NR Tx Profile is associated with a pair of source Layer-2 ID and destination Layer-2 TX UE. And only one NR Tx Profile is associated with a destination Layer-2 for RX UE. **That means the TX profile issue for GC/BC has been considered by SA2.**  However, for unicast, We find a note that the same default Destination Layer-2 ID for unicast initial signalling can be mapped to more than one V2X service types, but we cannot find any description of NR TX profile for DCR message are passing down to the AS layer.  Therefore, we suggest emphasize the NR Tx profile issue for DCR message in the LS. |
| Vivo | Option-3 | It seems to add additional question to confirm from SA2 is not necessary.  If companies think it is important, we can just include our agreement in the LS. i.e. the default DRX can be used for DCR. |
| Huawei, HiSilicon | Comments | For DCR, we can simply inform SA2 about what RAN2 agreed. |
| CATT | - | We support to simply include the RAN2 agreement in the LS. |
| Qualcomm | No | Just indicate to SA2 that default SL DRX may be applied to DCR. |

# Conclusion

Based on the comments in Q4, following agreement will be informed to SA2 to solve this issue:

The default SL DRX configuration for BC/GC [(including at least DRX cycle, start offset and on-duration timer)] can be used for both BC-based and UC-based DCR message.