**3GPP TSG-RAN WG2 Meeting #119e R2-22xxxxx**

**E-Meeting, August 2022**

**Source: Lenovo**

**Title:****Summary of 6.7.2.4 on Discovery and re-selection**

**Agenda Item:** **6.7.2.4**

**Document for:** **Discussion and Decision**

# Introduction

This contribution provides summary of contributions under 6.7.2.4 on discovery and re-selection.

# Discussion

### 2.1 Cast type for discovery message

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | [**R2-2207080**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207080.zip) | Discussion on MAC filtering for reception of discovery message | OPPO |

In RAN2#118 meeting, RAN2 sent an LS to SA2 to check the below issue:

* Q1: Can upper layer provide unicast / groupcast / broadcast cast-type-indicator to AS layer for the delivery of each discovery message?
* Q2: If No to Q1, whether SA2 is fine if all discovery message sent to unicast / groupcast / broadcast destination L2 ID always uses broadcast-type cast-type-indicator in SCI by Tx-UE, and are thus filtered in MAC layer at Rx-UE based on the destination L2 ID of the discovery message and broadcast-type cast-type indicator?

This contribution pointed out that if the discovery cast-type issue is solved by the upper layer providing a cast-type indicator to AS-layer, there is no impact on the AS-layer spec other than one change. The reason for that change is that the RX UE does not know the source layer 2 ID of the peer UE in a unicast manner. Alternatively, if processing all discovery messages as broadcast, [1] thinks that AS-layer will fail to avoid either discarding useful discovery messages or submitting useless discovery messages to the upper layer. Finally, [1] proposes that RAN2 wait for SA2‘s reply LS before concluding on the down-selection of the two options mentioned by [1].

**Rapporteur understands** it is natural to wait for relay from SA2 since we sent the LS to SA2 last meeting.

**Proposal 1: RAN2 wait for SA2‘s reply LS before concluding on the case that AS layer is not aware of cast type for a discovery message.**

### 2.2 Relay reselection as a stop condition of T300

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | [**R2-2207654**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207654.zip) | Correction for relay reselection while T300 is running | Lenovo |

In section 5.3.3.6 of TS38.331, if cell reselection or relay reselection occurs while T300 is running, UE shall perform the actions upon going to RRC\_IDLE as specified in 5.3.11. According to 5.3.11, UE shall stop T300 upon cell reselection or relay reselection.

[2] mentioned that ‘cell reselection’ is a stop condition of timer T300 in section 7.1.1 of the current RRC specifciation. However, ‘relay reselection’ as a stop condition for T300 is missing in section 7.1.1.

7.1 Timers

7.1.1 Timers (Informative)

| Timer | Start | Stop | At expiry |
| --- | --- | --- | --- |
| T300 | Upon transmission of *RRCSetupRequest.* | Upon reception of *RRCSetup* or *RRCReject* message, cell re-selection, relay reselection, the (re)selected L2 U2N Relay UE becomes unsuitable, and upon abortion of connection establishment by upper layers. | Perform the actions as specified in 5.3.3.7. |

**Proposal 2a: The ‘relay reselection’ should be added in timer table in section 7.1.1 as a stop condition of T300 according to the current procedure text.**

**Proposal 2b: If Proposal 2a is agree, ‘the (re)selected L2 U2N Relay UE becomes unsuitable’ as a stop condition for T300 should be removed. And update CR** [**R2-2207654**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207654.zip)**.**

### 2.3 Mode-1 dedicated discovery TX pool

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | [**R2-2207765**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207765.zip) | On the problem for mode-1 dedicated discovery TX pool | vivo |
| 4 | [**R2-2207766**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207766.zip) | [Draft] LS on mode-1 dedicated discovery transmission pool | vivo |

[3] observed that Mode-1 dedicated discovery TX pool(s) are specified in *sl-DiscTxPoolScheduling* which was introduced for the gNB to schedule dedicated resources to a mode-1 UE for both relay-related and non-relay related SL discovery transmission. However, as per the current specification (TS38.212), the gNB is unable to schedule any resource in the pool(s) configured by *sl-DiscTxPoolScheduling*, since the “Resource pool index” field in DCI format 3\_0 is currently unable to refer to *sl-DiscTxPoolScheduling*.

|  |
| --- |
| 7.3.1.4.1 Format 3\_0  DCI format 3\_0 is used for scheduling of NR PSCCH and NR PSSCH in one cell.  The following information is transmitted by means of the DCI format 3\_0 with CRC scrambled by SL-RNTI or SL-CS-RNTI:  - Resource pool index – bits, where *I* is the number of resource pools for transmission configured by the higher layer parameter *sl-TxPoolScheduling*.  - Time gap – 3 bits determined by higher layer parameter *sl-DCI-ToSL-Trans,* as defined in clause 8.1.2.1 of [6, TS 38.214]  - HARQ process number – 4 bits.  - New data indicator – 1 bit.  - Lowest index of the subchannel allocation to the initial transmission – bits as defined in clause 8.1.2.2 of [6, TS 38.214]  - SCI format 1-A fields according to clause 8.3.1.1:  - Frequency resource assignment.  - Time resource assignment.  […] |

[3] understands that sl-*DiscTxPoolScheduling* also should be considered in “Resource pool index” field besides *sl-TxPoolScheduling.* It is RAN2’s responsibility to inform RAN1 of the introduction of such *sl-DiscTxPoolScheduling* since the introduction of *sl-DiscTxPoolScheduling* was completely decided by RAN2 (**w/o** consulting RAN1’s views).

Furthermore, [3] suggests to inform RAN1 of the possible use cases that could be configured with such *sl-DiscTxPoolScheduling*, as they may impact on RAN1 solution for change DCI. For example, the UE may be configured with *sl-DiscTxPoolScheduling*:

* when the UE is configured to transmit *only* NR SL discovery; or
* when the UE is configured to transmit *both* NR SL discovery and NR SL communication.

**Rapporteur understands** that individual companies should approach RAN1 directly as this seems to be a RAN1 specific problem. RAN1 can be triggered to discuss based on the RAN1 contribution. Alternatively, LS can be used to trigger RAN1 discussion.

**Proposal 3a: RAN2 to inform RAN1 of the introduction of mode-1 dedicated discovery TX pool (i.e. *sl-DiscTxPoolScheduling*) and the problem that current DCI format 3\_0 fails to schedule the resources in dedicated discovery TX pool.**

**Proposal 3b: If Proposal 3a is agreed, RAN2 to discuss whether the LS includes the following two cases in which** *sl-DiscTxPoolScheduling* **is configured.**

**- Case 1: UE is configured to transmit only NR SL discovery;**

**- Case 2: UE is configured to transmit both NR SL discovery and NR SL communication.**

### 2.4 Clarification of SD-RSRP and SL-RSRP

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | [**R2-2207967**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207967.zip) | Clarification of SD-RSRP and SL-RSRP in TS 38.331 | NEC Corporation |

This contribution thinks SD-RSRP is defined in section 5.1.22 of TS 36.214, which is RSRP measured on DMRS of PSDCH. However, there is no PSDCH in NR sidelink. Consequently, SD-RSRP based on PSDCH DMRS cannot be applicable for NR sidelink. It was agreed in RAN2 that in *SD-RSRP measurement for relay (re)selection trigger and candidate relay evaluation, L3 filtering is applied across measurements on the DMRS of PSSCH transmission which carries discovery message from the concerned relay*. Therefore, [5] proposes to clarify in RRC specification that SD-RSRP is PSSCH-RSRP where PSSCH carries discovery message as follows.

3.2 Abbreviations (TS38.331)

*---Omitted---*

SCell Secondary Cell

SCG Secondary Cell Group

SCS Subcarrier Spacing

SD-RSRP PSSCH-RSRP where the PSSCH carries discovery message

SDT Small Data Transmission

SFN System Frame Number

*---Omitted---*

**Rapporteur understands** that it was agreed in L3 filtering for SD-RSRP is applied across measurements on the DMRS of PSSCH transmission which carries discovery message from the concerned relay. However, it may not be captured in specification. In addition, there is an abbreviation of Sidelink Discovery Reference Signal Received Power (SD-RSRP) in TS36.331. However, there is no explanation for SD-RSRP in TS38.331.

[R2-2207967](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207967.zip) propose to capture the definition of SD-RSRP in ‘Abbreviations’ section of TS38.331 based on the RAN2 agreement. I am not sure if it is suitable to be captured in ‘Abbreviations’ section of TS38.331.

**Proposal 4: RAN2 to discuss whether SD-RSRP should be defined as ‘PSSCH-RSRP where PSSCH carries discovery message’. If yes, adopt TP in** [**R2-2207967**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207967.zip) **as baseline.**

This contribution further pointed out that SL-RSRP has a definition in TS 38.133 section 3.3 as follows:

|  |
| --- |
| L1-RSRP Layer 1 RSRP  L1 SL-RSRP Layer 1 Sidelink RSRP which corresponds to PSCCH-RSRP and/or PSSCH-RSRP |

However, UE still has problem to measure SL-RSRP, i.e., whether UE should use PSCCH-RSRP or PSSCH-RSRP considering that PSCCH-RSRP and PSSCH-RSRP have different definitions in TS 38.215 section 5.1.23 and 5.1.24.

To solve the above ambiguity when UE use SL-RSRP, [5] proposes the following options.

* Option 1: Clarify that SL-RSRP means PSSCH-RSRP or PSCCH-RSRP in specification.
* Option 2: It's up to UE implementation to determine SL-RSRP as one of PSCCH-RSRP and PSCCH-RSRP.

**Rapporteur thinks** that SL-RSRP can be one of PSSCH-RSRP, PSCCH-RSRP and ‘PSSCH-RSRP and PSCCH-RSR’ according to the current specification TS38.133. Then it is UE implementation to determine which one is used. It seems unnecessary to clarify it in the specification. In addition, ‘PSSCH-RSRP and PSCCH-RSR’ is excluded based on the [5]. If this way is excluded for SL-RSRP, it could be discussed by RAN1 and RAN4. Therefore, Rapporteur suggests not to discuss this proposal in RAN2.

### 2.5 SL CG for discovery message

|  |  |  |  |
| --- | --- | --- | --- |
| 6 | [**R2-2208228**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208228.zip) | Support of SL CG for discovery message | Huawei, HiSilicon |

In Rel-17, SL CG type-1 (if configured) can be used for discovery transmission. In Rel-16 NR sidelink, the UE is able to report one or more traffic pattern information per sidelink QoS flow to assist gNB to provide SL CG. [6] thinks the existing UEAssistanceInformation message is not able to inform gNB whether it requires SL CG in dedicated resource pool for discovery. And the existing SL-TrafficPatternInfo cannot be applied for discovery message since there is no flow identity for discovery message as a PC5-S signal.

**Rapporteur thinks** If SL CG type-1 for discovery should be configured in mode-1 resource pool, the traffic pattern associated with discovery should be discussed in RAN2 since gNB cannot differentiate them based on the current specification.

**Proposal 5a: RAN2 to discuss whether new assistance information similar to SL-TrafficPatternInfo should be introduced in UEAssistanceInformation message to assist gNB to configure** **SL CG type 1 for discovery.**

**Proposal 5b: If proposal 5a is agreed, RAN2 to discuss whether the assistance information can include Discovery message periodicity, Timing offset and the message size information. If yes, adopt TP in** [**R2-2208228**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208228.zip) **as baseline.**

# Conclusion

Following proposals are made,

**[easy decision]**

**Proposal 1: RAN2 wait for SA2‘s reply LS before concluding on the case that AS layer is not aware of cast type for a discovery message.**

**Proposal 2a: The ‘relay reselection’ should be added in timer table in section 7.1.1 as a stop condition of T300 according to the current procedure text.**

**Proposal 2b: If Proposal 2a is agree, ‘the (re)selected L2 U2N Relay UE becomes unsuitable’ as a stop condition for T300 should be removed. And update CR [R2-2207654](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207654.zip).**

**Proposal 3a: RAN2 to inform RAN1 of the introduction of mode-1 dedicated discovery TX pool (i.e. *sl-DiscTxPoolScheduling*) and the problem that current DCI format 3\_0 fails to schedule the resources in dedicated discovery TX pool.**

**[to be discussed]**

**Proposal 3b: If Proposal 3a is agreed, RAN2 to discuss whether the LS includes the following two cases in which** *sl-DiscTxPoolScheduling* **is configured.**

**- Case 1: UE is configured to transmit only NR SL discovery;**

**- Case 2: UE is configured to transmit both NR SL discovery and NR SL communication.**

**Proposal 4: RAN2 to discuss whether SD-RSRP should be defined as ‘PSSCH-RSRP where PSSCH carries discovery message’. If yes, adopt TP in** [**R2-2207967**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207967.zip) **as baseline.**

**Proposal 5a: RAN2 to discuss whether new assistance information similar to SL-TrafficPatternInfo should be introduced in UEAssistanceInformation message to assist gNB to configure SL CG type 1 for discovery.**

**Proposal 5b: If proposal 5a is agreed, RAN2 to discuss whether the assistance information can include Discovery message periodicity, Timing offset and the message size information. If yes, adopt TP in** [**R2-2208228**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208228.zip) **as baseline.**

# Reference

[1] [**R2-2207080**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207080.zip)Discussion on MAC filtering for reception of discovery message OPPO

[2] [**R2-2207654**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207654.zip)Correction for relay reselection while T300 is running Lenovo

[3] [**R2-2207765**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207765.zip)On the problem for mode-1 dedicated discovery TX pool vivo

[4][**R2-2207766**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207766.zip)[Draft] LS on mode-1 dedicated discovery transmission pool vivo

[5][**R2-2207967**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207967.zip) Clarification of SD-RSRP and SL-RSRP in TS 38.331 NEC Corporation

[6][**R2-2208228**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208228.zip)Support of SL CG for discovery message Huawei, HiSilicon