**3GPP TSG-RAN WG4 Meeting # 101-bis-e R4-212xxxx**

**Electronic Meeting, Jan. 17-25, 2022**

**Agenda item:** 6.24

**Source:** Moderator (OPPO)

**Title:** Email discussion summary for [101-bis-e][226] NR\_SL\_relay

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

In this email discussion, we focus on the remaining issues of RRM impact for Rel17 NR SL relay.

* *Measurement requirements for SL Relay (re)selection*
* *Interruption requirements*
* *Measurement accuracy requirements*
* *Others*

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: Discussion on the listed issues, and provide the comments on draft CRs.
* 2nd round: Conclude the issues identified in the 1st round. Revise and endorse draft CRs

# Topic #1: General requirements for NR\_SL\_relay\_RRM

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

*[Moderator] The issues in Topic#1 focus on RRM requirements for NR\_SL\_relay*

* *Relay (re)Selection Procedure*
* *Measurement requirements*
* *Interruptions*
* *RRC Connection Re-establishment requirement*
* *Measurement accuracy requirement*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2200324**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2200324.zip) | Qualcomm, Inc. | **Proposal 1: For discover period definition, the resource reservation period in mode 2 refers to the dedicated resource pool period for discover signal or the resource reservation period defined in 38.213 clause 8.3.1 in shared resource pool for discover signal.****Proposal 2: Reuse LTE ProSe relay measurement requirement.** **Proposal 3: DRx has no impact on RAN4 discovery signal measurement requirement with the assumption that the discovery signal period is the multiples of the common or pre-configured DRx cycle lengths to avoid transmission of discovery signal during DRx off time.****Proposal 4: R16 V2X requirement specifies the SL communication configuration interruption on Uu for general SL communication, and it is applicable to SL relay discovery and communication configurations.****Proposal 5: Do not to specify RRC connection re-establishment delay requirement.****Proposal 6: Do not introduce SD-RSRP relative measurement accuracy requirement.**  |
| [**R4-2200330**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2200330.zip) | Qualcomm, Inc. | CR: SL discovery signal intra-frequency measurement accuracy requirements |
| [**R4-2201154**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201154.zip) | OPPO | CR to 38133 on measurement requirements for Selection/reselection of relay UE |
| [**R4-2201155**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201155.zip) | OPPO | ***Observation 1: The period of discovery can follow the corresponding pool’s resource reservation period in case of mode 2.******Observation 2: The assumption of R16 NR V2X can be reused for SL relay.******Observation 3: Different RRC configuration messages need to be considered for relay discovery and sidelink direct discovery (e.g., SL-ConfigDedicatedNR), which can be further decided by RAN2******Proposal 1: Reuse R16 V2X interruption requirements on WAN due to V2X sidelink communication configuration.******Proposal 2: RAN4 not to consider interruptions during discovery (Based on R16 V2X sidelink assumption).***  |
| [**R4-2201619**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201619.zip) | Huawei, Hisilicon | ***Proposal 1: For NR sidelink relay in R17, the interruption requirements at NR sidelink discovery configuration can be defined as follows:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *12.y Interruptions at NR sidelink discovery configuration**A UE capable of NR sidelink discovery may indicate its interest (initiation or termination) in NR sidelink discovery to the connected gNodeB using IE [TBD] in TS38.331[2].**The UE is allowed an interruption of up to the duration shown in Table 12.y-1 on the PCell/serving cell during the RRC reconfiguration procedure that includes the NR sidelink discovery configuration message [TBD] in TS 38.331[2] (setup and release). This interruption is for both uplink and downlink of the PCell/serving cell.****Table 12.y-1: Interruption length at NR sidelink discovery configuration***

|  |  |  |
| --- | --- | --- |
|  | ***NR Slot length (ms)*** | ***Interruption length******(number of slots)*** |
| *0* | *1* | *2* |
| *1* | *0.5* | *3* |
| *2* | *0.25* | *5* |
| *3* | *0.125* | *9* |

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***Proposal 2: For NR sidelink relay in R17, the measurement requirements for selection/reselection of NR SL relay UE can be defined as follows:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *12.z Selection/reselection of sidelink relay UE**This subclause contains the requirements related to selection and reselection of sidelink relay UE if a frequency dedicated to sidelink operation is used for sidelink communication via a ProSe relay UE.**For a remote UE configured by upper layer for relay operation, when the RSRP measurement of the serving cell (RRC\_IDLE) or the PCell (RRC\_CONNECTED) is below [TBD], the remote UE shall search for candidate relay UEs for selection and/or reselection every discovery period.**If the remote UE has a selected sidelink relay UE, then the remote UE shall measure the [RSRP] of the selected relay once in every four discovery periods and evaluate if it meets the relay selection criterion as defined in TS 38.331[2].**The remote UE shall measure [RSRP] of the candidate relay UEs every Tmeasure, SL\_Relay\_Intra for intra-frequency relay UEs that are detected and measured according to the measurement rules.**For an intra-frequency relay UEs that are detected, but that has not been selected or reselected to, the remote UE shall be capable of evaluating that the intra-frequency relay UE has met selection or reselection criterion defined in TS 38.331[2] within Tevaluate, SL\_Relay\_Intra as specified in table 7.16.5-1.****Table 12.z-1: Tmeasure, SL\_Relay\_Intra*** *and* ***Tevaluate, SL\_Relay\_intra***

|  |  |  |
| --- | --- | --- |
| ***Discovery Period [s]*** | ***Tmeasure, SL\_Relay\_Intra [s] (number of discovery periods)*** | ***Tevaluate, SL\_Relay\_intra [s] (number of discovery periods)*** |
| *0.04≤Discovery period≤10.24* | *Note 1 (4)* | *Note 1 (16)* |
| *NOTE 1: Time depends upon the discovery period. In resource allocation mode 2, the discovery period is defined as the resource reservation period. In resource allocation mode 2, the discovery period is defined as SPS transmission periodicity.* |

*The minimum requirements are required to meet when the selected and candidate relay UEs are transmitting relay discovery message every discovery period.* |

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| [**R4-2201620**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201620.zip) | Huawei, Hisilicon | DraftCR on interruption requirements for NR SL relay |
| [**R4-2201872**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201872.zip) | Ericsson | * **Proposal #1:** If Rel-17 SL relay operating scenario is similar to Rel-17 SL enhancement WI, interruptions due to SL shall be avoided on WAN during:
	+ reception of paging,
	+ reception of system information,
	+ while *onDurationTimer* is running.

**Proposal 2:** If Rel-17 SL relay operating scenario is similar to Rel-17 SL enhancement WI, the interruptions on WAN allowed due to SL include maximum allowed interruption rate, interruption length and location (if possibl |

## Open issues summary

### Sub-topic 1-1: Measurement requirements for Relay (re)selection

#### Issue 1-1: Clarification on Discovery period

|  |
| --- |
| Background: In RAN4#101e meeting, RAN4 made the following agreement for discovery period:* Use the period of the discover signal as the discovery period
	+ Resource reservation period (mode 2) or SPS transmission periodicity (mode 1) can be used
 |

* Proposals:
	+ Option 1(QC): For discover period definition, the resource reservation period in mode 2 refers to the dedicated resource pool period for discover signal or the resource reservation period defined in 38.213 clause 8.3.1 in shared resource pool for discover signal.
	+ Option 2(OPPO): The period of discovery can follow the corresponding pool’s resource reservation period in case of mode 2.
* Recommended WF
	+ Moderator: Option 1 and 2 are not contradictory. For mode 2, resource reservation period is configured per resource pool. Relay discovery can be configured in shared resource pool if only shared resource pool is configured. Otherwise, it should be configured in dedicated resource pool.
	+ The clarification can be captured in WF that in mode 2 discovery period can refer to the resource reservation period of shared resource pool if only shared resource pool is configured, or the resource reservation period of dedicated resource pool.

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| **Company** | **Comments** |
| XXX |  |

#### Issue 1-2: Measurement requirements for Relay (re)selection

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| Background: In RAN4#101e meeting, RAN4 made the following agreement for Measurement requirements:* Reuse measurement/evaluation period requirement from LTE ProSe.
 |

* Clarification question: whether to consider (re)selection of intra-frequency and/or inter-frequency relay UEs?
	+ Option 1: ONLY Intra-frequency (R4-2201619)
* the requirements related to selection and reselection of sidelink relay UE if a frequency dedicated to sidelink operation is used for sidelink communication via a ProSe relay UE.
	+ Option 2: Both intra-frequency and inter-frequency (R4-2201154)
* Recommended WF
	+ The measurement period for intra-frequency relay UE is defined as 4 discovery periods and the evaluation period for intra-frequency relay UE is defined as 16 discovery periods (i.e. 4 measurement periods).

***Table 12.z-1: Tmeasure, SL\_Relay\_Intra*** *and* ***Tevaluate, SL\_Relay\_intra***

|  |  |  |
| --- | --- | --- |
| ***Discovery Period [s]*** | ***Tmeasure, SL\_Relay\_Intra [s] (number of discovery periods)*** | ***Tevaluate, SL\_Relay\_intra [s] (number of discovery periods)*** |
| *0.04≤Discovery period≤10.24* | *Note 1 (4)* | *Note 1 (16)* |
| *NOTE 1: Time depends upon the discovery period. In resource allocation mode 2, the discovery period is defined as the resource reservation period. In resource allocation mode 2, the discovery period is defined as SPS transmission periodicity.* |

* + FFS: inter-frequency relay UE to be involved
	+ Further discussion on the details can focus on the revision of draft CR (R4-2201154)

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| **Company** | **Comments** |
| XXX |  |

#### Issue 1-3: DRX impact on Measurement requirements

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| Background: In RAN4#101e meeting, RAN4 made the following agreement:* Not to consider SL DRX for SL relay in R17.
 |

* Proposals:
	+ Option 1(QC): DRX has no impact on RAN4 discovery signal measurement requirement with the assumption that the discovery signal period is the multiples of the common or pre-configured DRX cycle lengths to avoid transmission of discovery signal during DRX off time.
* Recommended WF
	+ Option 1 can be used as baseline for discussion.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 1-2: Interruption requirements

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| Background: In RAN4#101e meeting, RAN4 made the following agreement for interruption requirements:* RAN4 agree to define interruption requirements at discovery configuration (for relay discovery and sidelink direct discovery).
	+ Interruption requirements for NR sidelink discovery should be defined **based onR16 V2X sidelink assumption.**
* FFS how to specify the requirements in next meeting
 |

####  Issue 1-4-1: How to define the interruption requirements at discovery configuration based on R16 V2X sidelink assumption?

* Proposals:
	+ Option 1(QC, HW): Define interruption on the PCell/serving cell during the RRC reconfiguration procedure
* R16 V2X requirement specifies the SL communication configuration interruption on Uu for general SL communication, and it is applicable to SL relay discovery and communication configurations.
* Recommended WF
	+ Option 1 is recommended.
	+ Further discussion on the details of interruption requirements can focus on draft CR (based on R4-2201620)

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| *12.y Interruptions at NR sidelink discovery configuration**A UE capable of NR sidelink discovery may indicate its interest (initiation or termination) in NR sidelink discovery to the connected gNodeB using IE [TBD] in TS38.331[2].**The UE is allowed an interruption of up to the duration shown in Table 12.y-1 on the PCell/serving cell during the RRC reconfiguration procedure that includes the NR sidelink discovery configuration message [TBD] in TS 38.331[2] (setup and release). This interruption is for both uplink and downlink of the PCell/serving cell.****Table 12.y-1: Interruption length at NR sidelink discovery configuration***

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| *2* | *0.25* | *5* |
| *3* | *0.125* | *9* |

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| **Company** | **Comments** |
| XXX |  |

#### Issue 1-4-2: Whether to further consider the impact from R17\_SL\_enhancement on interruption requirements of SL relay?

* + Option 1(Ericsson): If Rel-17 SL relay operating scenario is similar to Rel-17 SL enhancement WI,
		- the interruptions on WAN allowed due to SL include maximum allowed interruption rate, interruption length and location (if possible).
		- interruptions due to SL shall be avoided on WAN during:
			* reception of paging,
			* reception of system information,
			* while onDurationTimer is running.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 1-3: RRC connection reestablishment

#### Issue 1-5: Requirements for RRC connection reestablishment

* Proposals:
	+ Option 1(QC): Do not to specify RRC connection re-establishment delay requirement.
		- Specifying RRC connection re-establishment requirement itself can’t benefit network operation and has no improvement on system performance.
* Recommended WF
	+ Option 1 is recommended.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 1-4: Measurement accuracy requirements

#### Issue 1-6: Requirements for Measurement accuracy requirements

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| Background: In RAN4#101e meeting, RAN4 made the following agreement for interruption requirements:* Define unified requirements for both SD-RSRP and SL-RSRP measurement in relay discovery and (re)selection
	+ PSCCH-DMRS and/or PSSCH-DMRS can be used for the unified RSRP measurements.
	+ Reuse L1 SL-RSRP measurement accuracy requirement and side condition for both SL-RSRP in indirect to direct switch, and SD-RSRP direct to indirect switch.
 |

* Proposals:
	+ Option 1(QC): Do not introduce SD-RSRP relative measurement accuracy requirement.
* Recommended WF
	+ Option 1 is recommended.
	+ Further discussion on accuracy requirements can focus on draft CR (based on R4-2200330)

## Companies views’ collection for 1st round

### Open issues

***Comments are suggested to be provided directly in clause 1.2.***

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2201154(measurement requirements) | Company A |
| Company B |
|  |
| R4-2201620(interruption requirements) | Company A |
| Company B |
|  |
| R4-2200330(accuracy requirements) | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| **Sub-topic #1-1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic #1-2** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic #1-3** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic #1-4** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| *WF* |  |  |
| *LS* |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation  | **Comments** |
|  |  |  |  |  |
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Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
|  |  |  |  |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
|  |  |  |
|  |  |  |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)