**3GPP TSG-RAN WG2 #122 *R2-230xxxx***

**Incheon, Korea, May 2023**

Agenda Item: 7.9.4

Source: OPPO

Title: Summary of [AT122][402][Relay] Multi-path relay summary proposals (OPPO)

Document for: Discussion, Decision

# Introduction

This paper will discuss left issues for the multi-path relay.

# Pre-122 Ouput

We have the following proposals:

*Proposal 1 For Scenario-1/2, for intra-DU, MP remote UE is configured with a single cell group, i.e., MCG. R2 further discuss, for inter-DU, MP remote UE is configured with MCG only, or both MCG and SCG (which is for the indirect path).*

*Proposal 2 For Scenario-1/2, PDCP duplication of DRB is controlled by legacy Duplication Activation/Deactivation MAC CE and Duplication RLC Activation/Deactivation MAC CE delivered via direct path. FFS on whether to introduce dynamic duplication (de)activation for SRB.*

*Proposal 3 For Scenario-1/2, optionally configure UL data split threshold for split DRB. FFS the usage of the threshold follows legacy behavior or not.*

*Proposal 4 For Scenario-1/2, RRC sets the initial state of PDCP duplication for split SRB/DRB as in legacy.*

*Proposal 5 For Scenario-1/2, when reporting direct-path failure via indirect-path, use MCGFailureInformation message. FFS on whether additional IE needs to be introduced.*

*Proposal 6 For Scenario-1/2, when reporting indirect-path failure via direct-path, R2 discuss which message to use, e.g., MCGFailureInformation, SCGFailureInformation, SidelinkUEInformationNR, or a new message. FFS on whether additional IE needs to be introduced if legacy message is adopted.*

*Proposal 7 For Scenario-1/2, if MCGFailureInformation is agreed for direct path failure recovery in P5, reuse T316 timer for the direct path failure recovery.*

*Proposal 8 For Scenario-1/2, confirm the WA that: for a remote UE and relay UE in RRC\_CONNECTED, the network is expected to release the multipath configuration related to this relay at the remote UE before it releases the relay UE to RRC\_IDLE/INACTIVE. No spec impact is foreseen.*

*Proposal 9 For Scenario-1/2, no specification effort to handle the case when the relay UE moves to RRC\_IDLE following expiry of dataInactivityTimer, i.e., not pursue relay UE notifying remote UE, and remote UE notifying network.*

*Proposal 10 For Scenario-1/2, not pursue remote UE notifying network upon reception of notification message indicating relay UE handover. FFS whether rely on network to release configuration of relay UE at remote UE before relay UE handover, or rely on remote UE to suspend the indirect path upon reception of notification message indicating relay UE handover.*

*Proposal 11 For Scenario-1, R2 discuss whether to limit primary path of the split SRB1 and SRB2 always on direct path.*

*Proposal 12 For Scenario-1, R2 further discuss whether non-split SRB1/2 on indirect path is supported, i.e., whether to revert the previous agreement.*

*Proposal 13 For Scneario-1, support mode-1 of remote UE by reporting SR/BSR and receiving SL DG via direct-path. And mode-1 is supported at least for intra-DU case, and R2 further discuss whether it applies to inter-DU case. LS to R3 to notify this conclusion.*

*Proposal 14 For Scenario-1, R2 discuss whether to consider the MP scenario where there are both R17 relay-UE(s) and R18 relay-UE(s). If yes, R2 further discuss whether remote UE needs to be aware of the release / capability of relay UE supporting PC5-RRC based method to enter into RRC\_CONNECTED state. If yes, R2 further discuss how for remote UE to report candidate relay UE based on the release / capability information.*

*Proposal 15 For Scenario-1, reuse T304 for direct path addition and change. FFS on expiry behavior.*

*Proposal 16 For Scenario-1, reuse T420 for indirect path addition and change. FFS on stop condition and expiry behavior.*

*Proposal 17 For Scenario-2, remote-UE reports the RRC\_CONNECTED relay-UE C-RNTI and cell-ID for indirect path addition.*

*Proposal 18 For Scenario-2, R2 discuss whether remote-UE reports the RRC\_IDLE / RRC\_INACTIVE relay-UE ID for indirect path addition. And if Yes, which ID to report.*

*Proposal 19 For Scenario-2, R2 sends LS to S3 to check if any security concern for relay-UE sharing the ID (pending R2 conclusion on what ID to use) towards remote-UE.*

*Proposal 20 For Scenario 2, R2 discuss to de-prioritize the indirect path change case (i.e. case G) in this release.*

# At-122 Comments Collection

Firstly, we need to identify and coverge on easy ones as soon as possible.

*Proposal 1 For Scenario-1/2, for intra-DU, MP remote UE is configured with a single cell group, i.e., MCG. R2 further discuss, for inter-DU, MP remote UE is configured with MCG only, or both MCG and SCG (which is for the indirect path).*

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*Proposal 9 For Scenario-1/2, no specification effort to handle the case when the relay UE moves to RRC\_IDLE following expiry of dataInactivityTimer, i.e., not pursue relay UE notifying remote UE, and remote UE notifying network.*

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**Q1-1: Do you agree with the green part in P1/2/3/4/5/7/8/9/10?**

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| --- | --- | --- |
| **Company** | **Any proposals you disagree (None, or indicate the proposal number if any)** | **Comment** |
| OPPO | None |  |
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*Proposal 11 For Scenario-1, R2 discuss whether to limit primary path of the split SRB1 and SRB2 always on direct path.*

*Proposal 12 For Scenario-1, R2 further discuss whether non-split SRB1/2 on indirect path is supported, i.e., whether to revert the previous agreement.*

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*Proposal 15 For Scenario-1, reuse T304 for direct path addition and change. FFS on expiry behavior.*

*Proposal 16 For Scenario-1, reuse T420 for indirect path addition and change. FFS on stop condition and expiry behavior.*

**Q1-2: Do you agree with the green part in P13/15/16?**

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| --- | --- | --- |
| **Company** | **Any proposals you disagree (None, or indicate the proposal number if any)** | **Comment** |
| OPPO | None |  |
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*Proposal 17 For Scenario-2, remote-UE reports the RRC\_CONNECTED relay-UE C-RNTI and cell-ID for indirect path addition.*

*Proposal 18 For Scenario-2, R2 discuss whether remote-UE reports the RRC\_IDLE / RRC\_INACTIVE relay-UE ID for indirect path addition. And if Yes, which ID to report.*

*Proposal 19 For Scenario-2, R2 sends LS to S3 to check if any security concern for relay-UE sharing the ID (pending R2 conclusion on what ID to use) towards remote-UE.*

*Proposal 20 For Scenario 2, R2 discuss to de-prioritize the indirect path change case (i.e. case G) in this release.*

**Q1-3: Do you agree with the green part in P17/19?**

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| **Company** | **Any proposals you disagree (None, or indicate the proposal number if any)** | **Comment** |
| OPPO | None |  |
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Secondly, it would be helpful to check companies view on some key aspects that requires R2 discussion.

*Proposal 1 For Scenario-1/2, for intra-DU, MP remote UE is configured with a single cell group, i.e., MCG. R2 further discuss, for inter-DU, MP remote UE is configured with MCG only, or both MCG and SCG (which is for the indirect path).*

*Proposal 6 For Scenario-1/2, when reporting indirect-path failure via direct-path, R2 discuss which message to use, e.g., MCGFailureInformation, SCGFailureInformation, SidelinkUEInformationNR, or a new message. FFS on whether additional IE needs to be introduced if legacy message is adopted.*

**Q2-1a: For inter-DU case, how do you think the MP remote UE should be handled**

**Option-1: configured with MCG only**

**Option-2: configured with both MCG and SCG (which is for the indirect path)**

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| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 | Please note that in the legacy R17 U2N ASN.1, the indirect path configuration is out of CG configuration. So following legacy, there is no need to consider to introduce another CG configuration for the indirect path aritfically. |
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**Q2-1b: For Scenario-1/2, when reporting indirect-path failure via direct-path, which message to use?**

**Option-1: MCGFailureInformation,**

**Option-2: SCGFailureInformation,**

**Option-3: SidelinkUEInformationNR,**

**Option-4: or a new message.**

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| **Company** | **Option** | **Comment** |
| OPPO | 3 | Option-2 is not preferred since there is no such SCG.  Option-1 is not preferred since PCell is not on indirect path, so using MFI message and the related code-point/timer design is wired. |
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*Proposal 11 For Scenario-1, R2 discuss whether to limit primary path of the split SRB1 and SRB2 always on direct path.*

*Proposal 12 For Scenario-1, R2 further discuss whether non-split SRB1/2 on indirect path is supported, i.e., whether to revert the previous agreement.*

*Proposal 13 For Scneario-1, support mode-1 of remote UE by reporting SR/BSR and receiving SL DG via direct-path. And mode-1 is supported at least for intra-DU case, and R2 further discuss whether it applies to inter-DU case. LS to R3 to notify this conclusion.*

*Proposal 14 For Scenario-1, R2 discuss whether to consider the MP scenario where there are both R17 relay-UE(s) and R18 relay-UE(s). If yes, R2 further discuss whether remote UE needs to be aware of the release / capability of relay UE supporting PC5-RRC based method to enter into RRC\_CONNECTED state. If yes, R2 further discuss how for remote UE to report candidate relay UE based on the release / capability information.*

**Q2-2a: For Scenario-1, do you agree to limit primary path of the split SRB1 and SRB2 always on direct path?**

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| --- | --- | --- | --- |
| **Company** | **Agree/Disagree for SRB1** | **Agree/Disagree for SRB2** | **Comment** |
| OPPO | Yes |  | There is no benefit from this flexibility. |
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**Q2-2b: For Scenario-1, do you agree to support non-split SRB1/2 on indirect path?**

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| --- | --- | --- | --- |
| **Company** | **Agree/Disagree for SRB1** | **Agree/Disagree for SRB2** | **Comment** |
| OPPO | Disagree |  | We have a concern on the performance degradation due to this: by allowing this, UE may re-establish due to indirect-path failure even if direct-path works well, i.e., unnecessary service interruption. |
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**Q2-2c: For Scenario-1, how do you think to handle the mode-1 support in inter-DU case**

**Option-1: whether it is supported for inter-DU case is up to R3 but R2 does not expect R2 impact.**

**Option-2: Others (if this option is selected, please clarify what is the WF)**

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| **Company** | **Option** | **Comment** |
| OPPO | 1 |  |
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**Q2-2d: For Scenario-1, Whether to consider the MP scenario where there are both R17 relay-UE(s) and R18 relay-UE(s)?**

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| **Company** | **Yes/No** | **Comment** |
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*Proposal 18 For Scenario-2, R2 discuss whether remote-UE reports the RRC\_IDLE / RRC\_INACTIVE relay-UE ID for indirect path addition. And if Yes, which ID to report.*

*Proposal 20 For Scenario 2, R2 discuss to de-prioritize the indirect path change case (i.e. case G) in this release.*

**Q2-3a: For Scenario-2, Whether remote-UE reports the RRC\_IDLE / RRC\_INACTIVE relay-UE ID for indirect path addition?**

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| **Company** | **Yes/No** | **Comment** |
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**Q2-3b: If yes to Q2-3a, for Scenario-2, what ID to report?**

**Option-1: GUTI**

**Option-2: S-TMSI**

**Option-3: I-RNTI**

**Option-4: New ID**

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| **Company** | **Option** | **Comment** |
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**Q2-3c: For Scenario-2, do you agree to de-prioritize the indirect path change case (i.e. case G) in this release?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| OPPO | Yes |  |
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