**3GPP TSG-RAN2 Meeting 121bis *R2-230xxxx***

**E-meeting, April, 2023**

Agenda Item: 7.9.1

Source: LG

Title: [AT121bis-e][418][Relay] 38.300 relay CR draft (LG)

Document for: Discussion, Decision

# Introduction

This is for the following offline discussion

* [AT121bis-e][418][Relay] 38.300 relay CR draft (LG)

Scope: Collect comments on the CR outline in R2-2302994.

Intended outcome: Report to CB session and endorseable CR baseline

Deadline: Monday 2023-04-24 2359 UTC

# Discussion

## Contents for U2U Relay

The rel-18 U2U relay operation has some common parts and different parts compared to the rel-17 U2N relay operation. So, the common operation between the rel-17 U2N relay and the rel-18 U2U relay can be placed combined with the rel-17 U2N description part. The different operations between the rel-17 U2N relay and the rel-18 U2U relay can be placed on a separate sub-clause. We propose that common operations between the rel-18 U2U and the rel-17 U2N can be described in the following sub-clause: General (16.12.1 in TS 38.300), Relay Discovery (16.12.3 in TS 38.300) and Relay Selection/Reselection (16.12.4 in TS 38.300). And the rel-18 U2U operations differentiated from the rel-17 U2N can be described in the newly made sub-clause: L2 UE-to-UE Relay (16.12.2.x in TS 38.300) in protocol architecture (16.12.2 in TS 38.300) and Control plane procedures for L2 U2U Relay (16.12.x in TS 38.300).

**Proposal 1: For the rel-18 U2U relay description, the common parts with the rel-17 U2N relay can be described in the current existing sub-clause in TS 38.300: General(16.12.1 in TS 38.300), Relay Discovery(16.12.3 in TS 38.300 in TS 38.300) and Relay Selection/Reselection(16.12.4 in TS 38.300 in TS 38.300).**

**Proposal 2: For the rel-18 U2U relay description, the different parts from the rel-17 U2N relay can be described in the newly made sub-clause in TX 38.300: L2 UE-to-UE Relay(16.12.2.x in TS 38.300 in TS 38.300) and Control plane procedures for L2 U2U Relay(16.12.x in TS 38.300 in TS 38.300) can be made for rel-18 U2U.**

Q1) Do you agree that the following contents for U2U Relay are applied in 38.300 CR?

|  |
| --- |
| 16.12 Sidelink Relay  16.12.1 General  16.12.2 Protocol Architecture  16.12.2.1 L2 UE-to-Network Relay  **16.12.2.x L2 UE-to-UE Relay**  16.12.3 Relay Discovery  16.12.4 Relay Selection/Reselection  16.12.5 Control plane procedures for L2 U2N Relay  **16.12.x Control plane procedures for L2 U2U Relay** |

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | If no, please write down your opinion. |
| LG | Yes |  |
| Xiaomi | Yes |  |
| CATT | Yes |  |
| OPPO | Yes |  |
| Lenovo | Yes |  |
| China Telecom | Yes |  |
| Futurewei | Yes |  |
| ZTE | Yes |  |
| vivo | Yes |  |
| CMCC | Yes |  |
| Nokia | Yes |  |
| Samsung | Yes |  |
| NEC | Yes |  |
| Apple | Yes |  |
| Philips | Yes | “**TX 38.300**” in Proposal 2 should be “**TS 38.300**”. |
| Qualcomm | Yes |  |
| Intel | Yes |  |
| InterDigital | Yes |  |
| Huawei, HiSilicon | Yes |  |

## Contents for Service continuity

In rel-18 service continuity enhancement for U2N relay, inter-gNB D2I, I2D and I2I path switching, and intra-I2I path switching is introduced [2]. In the case of inter-gNB path switching, RAN2 can follow the RAN3 decision about which gNB will select path type and target relay UE. The procedure for path switching of inter-gNB can be added by the RAN3 side. However, the service continuity procedure for intra-i2i path switching can be added by the RAN2 side. We propose that inter-gNB D2I and I2D procedures are added to the intra-gNB D2I and I2D procedures without making a new sub-clause in the current sub-clause: switching from direct to indirect path (16.12.6.1 in TS 38.300) and switching from direct to indirect path (16.12.6.2 in TS 38.300). For the description of the intra/inter-gNB I2I procedures, a new sub-clause is needed to be made: switching from indirect to indirect path (16.12.6.x in TS 38.300).

**Proposal 3: RAN3 can put the description of inter-gNB d2i, i2d, and i2i path-switching procedures in the 38.300 draft spec.**

**Proposal 4: For the description of rel-18 service continuity enhancement, a new sub-clause can be made for the description of inter/intra i2i path switching procedure: Switching from indirect to indirect path (16.12.6.x in TS 38.300).**

**Proposal 5: For the description of rel-18 service continuity enhancement, the description of inter-gNB d2i, i2d and i2i path switching procedures can be added in the service continuity part for intra-gNB d2i, i2d and i2i path switching procedures: Switching from indirect to direct path (16.12.6.1 in TS 38.300), Switching from direct to indirect path (16.12.6.2 in TS 38.300) and Switching from indirect to indirect path (16.12.6.x in TS 38.300).**

Q2) Do you agree that the inter-gNB i2d/d2i/i2i path-switching procedures for service continuity can be added by RAN3 for 38.300 CR?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | If no, please write down your opinion. |
| LG | Yes |  |
| Xiaomi | Yes |  |
| CATT | Yes |  |
| OPPO | Yes |  |
| Lenovo | Yes |  |
| China Telecom | Yes |  |
| Futurewei | Yes |  |
| vivo | Yes |  |
| CMCC | Yes |  |
| Nokia | Yes |  |
| Samsung | Yes |  |
| NEC | Yes |  |
| Apple | Yes |  |
| Philips | Yes |  |
| Qualcomm | Yes |  |
| Intel | Yes |  |
| InterDigital | Yes |  |
| Huawei, HiSilicon | Yes |  |

For the question 1 and 2, all companies answered that it is agreeable that L2 UE-to-UE relay architecture and control plane procedures are described in parallel with legacy L2 U2N relay architecture and control plane procedures by adding a new sub-clause 16.12.2.x and 16.12.x. So, we can make the following proposal.

**Proposal 1: The following new sub-clause can be made under “16.12 Sidelink Relay” for UE-to-UE relay description on TS 38.300.**

**- A new sub-clause “16.12.2.x L2 UE-to-UE Relay” under “16.12.2 Protocol Architecture”.**

**- A new sub-clause “16.12.x Control Plane Procedure” under “16.12 Sidelink Relay”.**

Q3) Do you agree that the following contents for service continuity are applied in 38.300 CR?

|  |
| --- |
| 16.12.6 Service Continuity for L2 U2N relay  16.12.6.0 General  16.12.6.1 Switching from indirect to direct path  16.12.6.2 Switching from direct to indirect path  16.12.6.x Switching from indirect to indirect path |

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | If no, please write down your opinion. |
| LG | Yes |  |
| Xiaomi | Yes |  |
| CATT | Yes |  |
| OPPO | Yes |  |
| Lenovo | Yes |  |
| China Telecom | Yes |  |
| Futurewei | Yes |  |
| ZTE | Yes |  |
| vivo | Yes |  |
| CMCC | Yes |  |
| Nokia | Yes |  |
| Samsung | Yes |  |
| NEC | Yes |  |
| Apple | Yes |  |
| Philips | Yes |  |
| Qualcomm | Yes |  |
| Intel | Yes |  |
| InterDigital | Yes |  |
| Huawei, HiSilicon | Yes |  |

For the question 3, all companies answered that it is agreeable inter-gNB i2d/d2i description can be included in the legacy intra-gNB i2d/d2i description section instead of making new sub-clause. However, for the inter/Ingra-gNB i2i description, we can make new sub sub-clause under “16.12.6 Service Continuity for L2 U2N relay” section.

**Proposal 2: The following sub-clause can be** **made under “16.12.2 Sidelink Relay” for intra/inter-gNB i2i on TS 38.300.**

**- A new sub-clause “16.12.6.x Switching from indirect to indirect path” under “16.12.6 Service Continuity for L2 U2N relay”.**

2.3 Contents for Multi-path relay

Multi-path relay in rel-18 can be described separately from the rel-17 sidelink relay. In the point of view that the remote UE has two path, direct and indirect path, it can be differentiated from the rel-17 U2N sidelink relay. So, we propose making a new clause for the multi-path relay different from the sidelink relay clause.

**Proposal 6: New clause different from a sidelink relay (16.12 in TS 38.300) can be made for the multi-path relay: Multi-path relay (16.X in TS 38.300)**

Q4) Do you agree that the following contents for Multi-path Relay are applied in 38.300 CR?

|  |
| --- |
| 16.X Multi-path Relay  16.X.1 General  16.X.2 Protocol Architecture  16.X.3 Control plane procedure for multi-path relaying |

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | If no, please write down your opinion. |
| LG | Yes |  |
| Xiaomi | Yes |  |
| CATT | See comments | For Rel-18 SL relay enhancement, there are three parts(U2U,service continuity enhancement and MP). The first two bullets are added under 16.12 in TS 38.300, while the last part(MP) is added under a new clause 16.x in TS 38.300.It is a little bit confused to us and we would like to hear more companies view on this point. |
| OPPO | No | Multi-path relay can also be a sub-clause of sidelink relay (no need for a different clause) since a lot of procedures for single path relay are reused for multi-path, e.g., the relay selection/discovery … |
| Lenovo | No | Other minor comments:   1. Control plane procedures for multi-path relaying. 2. Both ‘Multi-path Relay’ and ‘multi-path relaying’ are used. |
| China Telecom | No | We prefer to have a sub-clause for multi-path relay (16.12.x  ) under the current sidelink relay (clause 16.12 in TS 38.300), which seems clearer. |
| Futurewei | No | Multi-path relay should be a sub-clause of sidelink relay, like the following:  16.12 Sidelink Relay  16.12.1 General  16.12.2 Protocol Architecture  16.12.2.1 L2 UE-to-Network Relay  **16.12.2.x L2 UE-to-UE Relay**  **16.12.2.y Multi-path Relay**  16.12.3 Relay Discovery  16.12.4 Relay Selection/Reselection  16.12.5 Control plane procedures for L2 U2N Relay  **16.12.x Control plane procedures for L2 U2U Relay**  **16.12.y Control plane procedures for Multi-path Relay** |
| ZTE | Yes | Considering that scenario 2 of multi-path relay has nothing to do with sidelink, it is better to have a separate clause for multi-path relay. |
| vivo | Yes | For Scenario 2, it seems there is no “relay procedure” based on Rel-17. So, it seems odd to describe scenario 2 procedure under SL relay subclause. A new clause is much more appropriate. |
| CMCC | Yes | In scenario 2 multi-path, the UE to UE link is non-3gpp interface, which is different from scenario 1. So, adding new clause is more clear. |
| Nokia | No | We prefer to capture MP in 16.12. Some parts of 16.12 are also applicable for MP case, some parts of 16.12 requires some extensions due to MP.  A new subclause within 16.12 to capture MP specific aspects is also needed. |
| Samsung | No | We think that multi-path relay should be specified in the same clause as other relay features. |
| NEC | Yes with comments | Separate sub-clauses may be added for two scenarios, for example, there may be two sub-clauses according to tow scenarios in 16.X.2 about protocol architecture. |
| Apple | Yes | We are fine to have a dedicated clause for this. But we think the title is better to be changed to “Multi-path with relay”, which is more accurate than “multi-path relay” and “multi-path relaying”. |
| Philips | Yes |  |
| Qualcomm | No | Scenario 1 reuse sidelink U2N mechanism. Scenario 2 has common design with Scenario 1 in many aspects. So it is more reasonable to reuse existing clause. |
| Intel | Yes, due to Scenario 2 | We have a slight preference to make it a separate section as Scenario 2 is not Sidelink-related, it may be confusing to put it under Sidelink Relay section.  We could mostly refer to the current L2 U2N Relay section from within this new section for scenario 1 (e.g. after providing the new protocol architecture for MP, we can suggest that the relay discovery, (re)selection and control plane procedures as in 16.12.x apply). |
| InterDigital | Yes | We think multipath has sufficient differences compared to Rel17 relays that its own section is preferrable. |
| Huawei, HiSilicon | Yes | We also think that many aspects of multipath are different form Rel 17 hence it would be better to have a separate section for it. |

About this skeleton, companies have separate opinions. Some companies think that the new section for multi-path relay should be included in the legacy sidelink relay section [8/19]. And the other companies think that the new section for multi-path relay should be made a new clause in parallel with the legacy “16.2 Sidelink Relay” section [11/19]. So, we can make the following proposal.

**Proposal 3. RAN2 can discuss where a new clause for the multi-path relay is placed on TS 38.300.**

**(Option 1) making a new clause in parallel with the legacy “16.2 Sidelink Relay”[11/19].**

**(Option 2) making a new sub-clause under “16.2 Sidelink Relay”[8/19].**

# Conclusion

We have the following proposals:

**Proposal 1: The following new sub-clause can be made under “16.12 Sidelink Relay” for UE-to-UE relay description on TS 38.300.**

**- A new sub-clause “16.12.2.x L2 UE-to-UE Relay” under “16.12.2 Protocol Architecture”.**

**- A new sub-clause “16.12.x Control Plane Procedure” under “16.12 Sidelink Relay”.**

**Proposal 2: The following sub-clause can be** **made under “16.12.2 Sidelink Relay” for intra/inter-gNB i2i on TS 38.300.**

**- A new sub-clause “16.12.6.x Switching from indirect to indirect path” under “16.12.6 Service Continuity for L2 U2N relay”.**

**Proposal 3. RAN2 can discuss where a new clause for the multi-path relay is placed on TS 38.300.**

**(Option 1) making a new clause in parallel with the legacy “16.2 Sidelink Relay” [11/18].**

**(Option 2) making a new sub-clause under “16.2 Sidelink Relay” [8/10].**

# Reference

1. TS 38.300, “NR; NR and NG-RAN Overall Description; Stage 2,” v17.4.0
2. [2] RP-221262, “Revised WID on NR sidelink relay enhancements,” LG Electronics, June, 2022.