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

Online, 10-17 October 2022

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# Status of At-Meeting Email Discussions

This subclause is not an Agenda Item. It contains a running summary of the email discussions assigned to take place during the meeting weeks. This section will be moved to an appendix in the final version of the report.

* [AT119-e][400][POS][Relay] Organisational Nathan – Positioning/Relay (MediaTek)

Scope: Organisational discussions and announcements, as needed throughout the meeting weeks

Intended outcome: Well-informed participants

Deadline: Wednesday 2022-10-19 1000 UTC

* [AT119bis-e][408][POS] State change during positioning (Intel)

Scope: Discuss the LS in R2-2209331 and related contributions (R2-2209611 / R2-2209610 / R2-2210119 / R2-2209437), conclude on whether the state transition needs to be supported, and draft a reply.

Intended outcome: Report in R2-2210895 and approvable LS in R2-2210896

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][409][POS] LS on TEG framework (CATT)

Scope: Discuss the LS in R2-2209342 and related contributions in R2-2209432 and R2-2209433, and draft a reply.

Intended outcome: Report in R2-2210897 and approvable LS in R2-2210898

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][410][POS] Rel-17 positioning RRC CR (Ericsson)

Scope: Check the rapporteur CR in R2-2210312 and update it with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2210899

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][411][Relay] Relay cause value (vivo)

Scope: Discuss the LS in R2-2209306 and related documents (R2-2209812 / R2-2209813 / R2-2209814 + first change from R2-2209903), consider the proposed correction, and draft a reply.

Intended outcome: Report in R2-2210900, approvable LS, and agreeable CR if needed

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][412][Relay] Rel-17 relay RLC and PDCP CRs (Samsung)

Scope: Check the rapporteur CRs in R2-2210011 and R2-2210012 and update them with decisions of this meeting.

Intended outcome: Agreed in principle CRs (without CB if possible)

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][413][Relay] Rel-17 relay 38.304 CR (Ericsson)

Scope: Check the rapporteur CR in R2-2210324 and update it with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2210970

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][414][Relay] Rel-17 relay RRC CR (Huawei)

Scope: Check the rapporteur CR in R2-2210493, consider related proposals on RRC, and merge in decisions of this meeting. Checkpoint at Rel-17 CB second week; discussion can be extended for merging of the CR.

Intended outcome: Report in R2-2210901 and agreeable CR in R2-2210902

Deadline: Friday 2022-10-14 1000 UTC (for initial checkpoint)

* [AT119bis-e][415][Relay] LS on authorization for UE-to-UE relay (LG)

Scope: Discuss the LS in R2-2209357 and attempt to converge on a reply.

Intended outcome: Approvable LS in R2-2210903

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][416][POS] LPP CR (Qualcomm)

Scope: Merge the agreed LPP changes into a rapporteur CR.

Intended outcome: Report in R2-2210905 and agreeable CR in R2-2210904

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][417][POS] Calculation of TIR and provision of AL to UE (vivo)

Scope: Discuss the proposal from R2-2210606 and conclude on a way forward.

Intended outcome: Report to CB session in R2-2210906

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][418][POS] Positioning MAC CR (Huawei)

Scope: Merge agreed MAC changes for Rel-17 positioning into a rapporteur CR.

Intended outcome: Report in R2-2210891 and agreeable CR in R2-2210894

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][419][POS] PRS capability information (Ericsson)

Scope: Check and update the CR in R2-2210310.

Intended outcome: Agreeable CR in R2-2210907

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][420][Relay] Rel-17 SRAP CR (OPPO)

Scope: Check the wording of P1 from R2-2210770 and the content of P2, and develop a CR to 38.351.

Intended outcome: Report in R2-2210971 and agreeable CR in R2-2210972

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][421][Relay] Rel-17 relay MAC CR (Apple)

Scope: Check the CR in R2-2209501.

Intended outcome: Agreed CR (without CB if possible)

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][422][Relay] Remaining proposals on discovery and (re)selection (CATT)

Scope: Discuss P3a/P3b/P5a/P5b of R2-2210777.

Intended outcome: Report to CB session in R2-2210908

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][423][POS] LS to SA2 on SL positioning terminology (Xiaomi)

Scope: Discuss the LS in document R2-2209351 and develop a response.

Intended outcome: Report in R2-2210909 and agreeable LS in R2-2210910

Deadline: Friday 2022-10-14 1000 UTC (for comments)

* [AT119bis-e][424][POS] SLPP/RSPP protocol design (Qualcomm)

Scope: Continue discussion of P5/P6 of R2-2210363 and attempt to converge. Focus on what the use cases are and the functionalities that need to be supported by the protocol design.

Intended outcome: Report to CB session in R2-2210911

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][425][Relay] Adaptation layer for scenario 2 (LG)

Scope:

* Discuss the potential for an adaptation layer on the Uu and UE-to-UE links in scenario 2, considering the possibility of making the adaptation layer configurable/optional on either link, and focussing on whether the following aspects can/should be supported in Scenario 2 without an adaptation layer:

- Possibility of restriction to the relay UE serving only one remote UE

- Possibility of restriction to 1:1 bearer mapping only over non-3GPP UE-to-UE link and 3GPP Uu link.

- Mapping a PDCP entity of the remote UE to a RLC entity of the relay UE to ensure that a PDCP PDU is delivered to an intended PDCP entity or RLC entity for support of more than one RB

- Possibility to support interoperability between two UEs from different vendors

- Ensuring identification of data own by the relay UE and data relayed from/to the remote UE over the Uu link.

* Consider whether SRAP is a suitable baseline for a scenario 2 adaptation layer, considering both Uu and the ideal link (potentially different conclusions for the two links)

Intended outcome: Report to CB session in R2-2210912

Deadline: Monday 2022-10-17 1700 UTC

* [AT119bis-e][426][Relay] Control plane aspects for multi-path (OPPO)

Scope: Discuss P11/P12/P18/P19/P20 of R2-2209375, considering applicability to both scenarios 1 and 2.

Intended outcome: Report to CB session in R2-2210913

Deadline: Monday 2022-10-17 1700 UTC

* [AT119bis-e][427][Relay] Remaining proposals on UE-to-UE relay (InterDigital)

Scope: Discuss P4.2/P6.1/P8.2/P9.1 of R2-2210893.

Intended outcome: Report to CB session in R2-2210914

Deadline: Monday 2022-10-17 1700 UTC

* [AT119bis-e][428][POS] LS to RAN1 on SRS in multiple cells (Huawei)

Scope: Draft an LS to RAN1 to ask them about interference issues with SRS configurations across multiple cells and about the validity of SRS parameters.

Intended outcome: Approved LS (without CB if possible) in R2-2210917

Deadline: Monday 2022-10-17 1700 UTC

* [AT119bis-e][429][POS] Rel-18 integrity text proposal (CATT)

Scope: Draft a text proposal on the RAN2 agreements on RAT-dependent integrity.

Intended outcome: Endorsable TP in R2-2210918

Deadline: Monday 2022-10-17 1700 UTC

# 6 NR Rel-17

## 6.7 NR Sidelink relay

(NR\_SL\_Relay-Core; leading WG: RAN2; REL-17; WID: RP-212601)

Tdoc Limitation: 4 tdocs

### 6.7.1 Organizational

Incoming LSs, TS updates, rapporteur inputs. This AI is reserved for rapporteur and organizational inputs. For LSes that need action or have impact beyond taking into account by CR rapporteurs: One tdoc by contact company (one company) to address the LS and potential reply is considered Rapporteur Input and may be provided. Related documents and proposed responses from companies other than the contact company should be submitted to the corresponding technical agenda item.

Cause value

[R2-2209306](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Docs\R2-2209306.zip) LS on setting RRC establishment cause value when relay UE has its own service (C1-225453; contact: vivo) CT1 LS in Rel-17 5G\_ProSe To:RAN2 Cc:SA2

[R2-2209812](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209812_%5bDraft%5d%20LS%20reply%20on%20setting%20RRC%20establishment%20casue%20value%20when%20relay%20UE%20has%20its%20own%20service.docx) [Draft] LS reply on setting RRC establishment casue value when relay UE has its own service vivo LS out To:CT1 Cc:SA2

[R2-2209813](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209813_Discussion%20on%20LS%20from%20R2-2209206(C1-225453).docx) Discussion on LS from R2-2209206(C1-225453) vivo discussion

[R2-2209814](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_CR3509_(Rel-17)_R2-2209814_Correction%20to%20the%20L2%20U2N%20Relay%20UEí) Correction to the L2 U2N Relay UE’s cause value setting behaviour vivo CR Rel-17 38.331 17.2.0 3509 - F NR\_SL\_relay-Core

* [AT119bis-e][411][Relay] Relay cause value (vivo)

Scope: Discuss the LS in R2-2209306 and related documents (R2-2209812 / R2-2209813 / R2-2209814 + first change from R2-2209903), consider the proposed correction, and draft a reply.

Intended outcome: Report in R2-2210900, approvable LS, and agreeable CR if needed

Deadline: Friday 2022-10-14 1000 UTC

Rapporteur CRs

[R2-2210011](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210011%2038.322%20draftCR%20Correction%20on%20RLC%20for%20SL%20Relay.docx) RLC correction for SL relay Samsung draftCR Rel-17 38.322 17.1.0 F NR\_SL\_relay-Core

[R2-2210012](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210012%2038.323%20draftCR%20Correction%20on%20PDCP%20for%20SL%20Relay.docx) PDCP correction for SL relay Samsung draftCR Rel-17 38.323 17.2.0 F NR\_SL\_relay-Core

* [AT119bis-e][412][Relay] Rel-17 relay RLC and PDCP CRs (Samsung)

Scope: Check the rapporteur CRs in R2-2210011 and R2-2210012 and update them with decisions of this meeting.

Intended outcome: Agreed in principle CRs (without CB if possible)

Deadline: Friday 2022-10-14 1000 UTC

R2-2210915 RLC correction for SL relay Samsung CR Rel-17 38.322 17.1.0 0050 - F NR\_SL\_relay-Core

R2-2210916 PDCP correction for SL relay Samsung CR Rel-17 38.323 17.2.0 0104 - F NR\_SL\_relay-Core

[R2-2210324](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38.304_CR0288(Rel-17)_R2-2210324-%20Misc%20correction%20on%2038.304%20for%20SL%20relay.docx) Misc correction in 38.304 for SL relay Ericsson (Rapporteur) CR Rel-17 38.304 17.2.0 0288 - F NR\_SL\_relay-Core

* Revised in R2-2210970 (email discussion [413])
* [AT119bis-e][413][Relay] Rel-17 relay 38.304 CR (Ericsson)

Scope: Check the rapporteur CR in R2-2210324 and update it with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2210970

Deadline: Friday 2022-10-14 1000 UTC

R2-2210970 Misc correction in 38.304 for SL relay Ericsson (Rapporteur) CR Rel-17 38.304 17.2.0 0288 1 F NR\_SL\_relay-Core

[R2-2210493](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_CR3549_(Rel-17)_R2-2210493%20Misc%20RRC%20CR%20for%20SL%20relay.docx) Misc RRC CR for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3549 - F NR\_SL\_relay-Core

* [AT119bis-e][414][Relay] Rel-17 relay RRC CR (Huawei)

Scope: Check the rapporteur CR in R2-2210493, consider related proposals on RRC, and merge in decisions of this meeting. Checkpoint at Rel-17 CB second week; discussion can be extended for merging of the CR.

Intended outcome: Report in R2-2210901 and agreeable CR in R2-2210902

Deadline: Friday 2022-10-14 1000 UTC (for initial checkpoint)

### 6.7.2 Essential corrections

No documents should be submitted to 6.7.2. Please submit to 6.7.2.x.

#### 6.7.2.1 Stage 2 corrections

Including impact to 38.300.

[R2-2209815](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\37340_CR0348_(Rel-17)_R2-2209815_Correction%20on%20Sidelink%20based%20U2N%20Relay.docx) Correction on Sidelink based U2N Relay vivo CR Rel-17 37.340 17.2.0 0348 - F NR\_SL\_relay-Core

[R2-2210110](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38300_CR0569_(Rel-17)_R2-2210110%20Correction%20on%20L2%20U2N%20relay%20Protocol%20Architecture.docx) Corrections on SL relay ZTE, Sanechips CR Rel-17 38.300 17.2.0 0569 - F NR\_SL\_relay-Core

#### 6.7.2.2 Control plane corrections

Including connection management, SI delivery, paging, access control for remote UE, and service continuity.

Summary document

[R2-2210890](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210890.docx) [Pre119bis-e][401] Summary of AI 6.7.2.2 on relay control plane (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

Easy proposals:

Small corrections:

[Easy] Proposal 0: For the changes/proposals suggested to agree in Table 1, merge the changes in RRC Rapp CR and further check the wording in CR update. [No inter-operability issue]

Discussion:

Nokia had a comment on P2 of R2-2209377 offline; it is not clear to them that this change is really needed.

OPPO indicate that we agreed last meeting to introduce this condition into the discovery message transmission, but we missed including it in the SUI conditions. Huawei have the same understanding as OPPO.

Agreement:

For the changes/proposals suggested to agree in Table 1 of R2-2210890, merge the changes in RRC Rapp CR and further check the wording in CR update.

RLC handling:

[Easy]Proposal 1: RAN2 confirms that the Tx-UE ensures alignment between sl-RLC-ChannelID-PC5-r17 (Generated by Tx-UE to configure Rx-UE via PC5-RRC) and sl-EgressRLC-ChannelPC5-r17 (Received by Tx-UE via Uu-RRC), and network ensures alignment on sl-EgressRLC-ChannelPC5-r17 configured to remote UE and relay UE for the same E2E bearer. [NW and UEs need to align the understanding]

[Easy]Proposal 2.1: RAN2 confirms the specified SL\_RLC0- configuration is used to establish Tx and Rx RLC channels for SRB0 messages without peer UE’s indication. [UEs need to align the understanding]

Agreements:

[Easy]Proposal 1: RAN2 confirms that the Tx-UE ensures alignment between sl-RLC-ChannelID-PC5-r17 (Generated by Tx-UE to configure Rx-UE via PC5-RRC) and sl-EgressRLC-ChannelPC5-r17 (Received by Tx-UE via Uu-RRC), and network ensures alignment on sl-EgressRLC-ChannelPC5-r17 configured to remote UE and relay UE for the same E2E bearer. [NW and UEs need to align the understanding]

[Easy]Proposal 2.1: RAN2 confirms the specified SL\_RLC0- configuration is used to establish Tx and Rx RLC channels for SRB0 messages without peer UE’s indication. [UEs need to align the understanding]

MAC handling:

[Easy]Proposal 4: RAN2 confirms the MAC is reset by L2 U2N Remote UE upon reception of D2I path switch command. [No inter-operability issue]

Agreement:

[Easy]Proposal 4: RAN2 confirms the MAC is reset by L2 U2N Remote UE upon reception of D2I path switch command. [No inter-operability issue]

Exceptional resource pool during D2I path switch:

[Easy]Proposal 6: RAN2 to revise the previous agreement as “RAN2 confirms during path switch (T420 is running), UE can use exceptional pool for sidelink communication”, and confirm that this agreement can already be realized via existing NR SL communication procedure with no extra Spec impact. [No inter-operability issue]

Discussion:

Apple want to understand what the change from default behaviour is; they understand that for mode 1, the UE will receive an RRCReconfiguration with a dedicated configuration, and if the exceptional pool is not there, the UE just uses the dedicated pool for mode 2.

Huawei indicate that the UE will not be configured with mode 1 when switching to a relay, and the reason for the rewording is that in the current spec, when the UE is configured with mode 2 and there is no sensing result, the UE can fall back to use the exceptional pool; i.e., the UE is allowed to use the exceptional pool and we do not need any change for the relay case.

Ericsson wonder if during the transition period, the UE initially uses mode 1 or mode 2. They understand that the UE cannot switch between mode 1 and mode 2. Huawei indicate that the target will necessarily configure mode 2.

Agreement:

[Easy]Proposal 6: RAN2 to revise the previous agreement as “RAN2 confirms during path switch (T420 is running), UE can use exceptional pool for sidelink communication”, and confirm that this agreement can already be realized via existing NR SL communication procedure with no extra Spec impact. [No inter-operability issue]

38.304 corrections:

[Easy]Proposal 7: The intention of change in 9500 and the change #1 and #3 in 0625 can be agreed, and how to capture them is up to TS 38.304 rapporteur in CR update. [No inter-operability issue]

Discussion:

Huawei clarify the tdoc numbers are wrong in the proposal.

Agreement:

The intention of change in R2-2209500 and the change #1 and #3 in R2-2210625 can be agreed, and how to capture them is up to TS 38.304 rapporteur in CR update (email discussion [413]).

Others:

[Easy]Proposal 11: RAN2 confirms SRB4 and application layer measurement are not supported for L2 U2N Remote UE, which means sl-L2RemoteUE-Config cannot be configured to a UE if appLayerMeasConfig and SRB4 are configured/not released. [NW and remote UE need to align the understanding]

Agreement:

[Easy]Proposal 11: RAN2 confirms SRB4 and application layer measurement are not supported for L2 U2N Remote UE, which means sl-L2RemoteUE-Config cannot be configured to a UE if appLayerMeasConfig and SRB4 are configured/not released. [NW and remote UE need to align the understanding]

Proposals for essential corrections:

RLC handling:

[To be discussed] Proposal 2.2: RAN2 to discuss if the default SL\_RLC1 configuration is used to establish Rx RLC channels for SRB1 messages without Tx UE’s indication, or to adopt PC5-RRC from Tx to Rx for the default SL\_RLC1 configuration. [UEs need to align the understanding]

Discussion:

Apple think when we defined SL-RLC1 as a default configuration, we meant that no explicit signalling was needed; so they think we should take the first option.

OPPO think some detailed discussion would be useful before concluding; they see some issue if we do not have the PC5-RRC signalling, e.g., if we change from default to dedicated but later fall back to default, but also some issues with the PC5-RRC signalling regarding aligning IDs. So they would like to go offline with this proposal.

To be handled in email discussion [414]

[To be discussed] Proposal 3.1: RAN2 confirms that overriding the SL-RLC1 by dedicated configuration means “changing SRAP mapping of SRB1 from ‘without PC5 RLC channel configured for SRB1’ to ‘with PC5 RLC channel configured to SRB1’”. [NW and UEs need to align the understanding]

Discussion:

MediaTek see some connection to P2.2 and think they should be discussed together. Huawei think the connection is only for how the Tx UE handles the overriding; if a different option is selected by P2.2, the Tx UE behaviour may change, but we can agree for the Rx UE.

Apple have the same understanding as Huawei, and they think the proposal is the only possibility for the Rx side.

Agreement:

Proposal 3.1: RAN2 confirms that overriding the SL-RLC1 by dedicated configuration means “changing SRAP mapping of SRB1 from ‘without PC5 RLC channel configured for SRB1’ to ‘with PC5 RLC channel configured to SRB1’”. [NW and UEs need to align the understanding]

[To be discussed] Proposal 3.2: RAN2 confirms the remote UE establishes SL\_RLC1 using default configuration for SRB1 upon full configuration, and network can explicitly provide PC5 Relay RLC channel configurations to override SL\_RLC1. [NW and UEs need to align the understanding]

Discussion:

OPPO agree with the intention, but they want to clarify if “establishes SL-RLC1” means applying the default configuration. They think there might be a case where we do not establish a new SL-RLC1 although the remote UE receives a full configuration.

MediaTek want to understand how big the spec impact will be. They are concerned that there may be additional signalling over Uu and/or PC5 and a risk of an NBC change.

Huawei indicate that they do not see any need for an ASN.1 change, because the channel IDs and RLC configurations are already there on Uu and PC5; we just need to clarify how the network and Tx UE provide them.

Agreement:

[To be discussed] Proposal 3.2: RAN2 confirms the remote UE establishes SL\_RLC1 using default configuration for SRB1 upon full configuration, and network can explicitly provide PC5 Relay RLC channel configurations to override SL\_RLC1. [NW and UEs need to align the understanding]

Wording and impact to be checked in email discussion [414].

[To be discussed] Proposal 13: RAN2 confirms that each PC5 Relay RLC channel configuration provided by network to Relay UE is uniquely associated with one Remote UE. [NW and UEs need to align the understanding]

Discussion:

vivo do not understand why we need such a restriction, since the SRAP header includes a local ID; they think it is technically feasible to have a PC5 relay RLC channel used by multiple remote UEs.

Huawei intend the proposal to exclude the case that the relay UE uses one configuration to create two RLC channels that communicate with different remote UEs; this aligns with Rel-16, and they understand that if we allow such usage, we will create problems if we want to release or modify one of the configurations but not the other.

OPPO understand the point is to check if a single RLC channel configuration can be used to establish the entities for different remote UEs; if there is then a modification or release, would it then apply to the multiple established RLC channels? They find this a bit weird and think further offline discussion might be useful.

Apple support the proposal and think it is challenging to have the procedures handle both channels if we do not have it.

Ericsson understand the proposal has no spec impact, and they are a bit uncertain of the intention. MediaTek think we do not need to mandate network behaviour.

Samsung had not considered that this could be done with multiple remote UEs, but they are also a bit concerned about specifying network implementations. They understand that there is a remote UE ID in the configuration and are not clear how it could be used for multiple remote UEs, so they do not see Huawei’s concern as being a real problem.

Huawei indicate that the RLC channel list was originally inherited from Rel-16, and one configuration for multiple RLC channels was not considered. They agree that the current specification does not allow such UE behaviour, but there was some concern indicated that the spec is not clear and it could be good to clarify. They do not understand that it is a limit to currently allowed network behaviour, only a clarification.

Apple see that the problem is that the remote UE ID is not in the PC5 relay RLC channel configuration, only in the bearer mapping.

To be further discussed in email discussion [414].

Left proposals:

Entering RRC\_IDLE/RRC\_INACTIVE:

[To be discussed] Proposal 5: RAN2 confirms upon entering RRC\_IDLE/INACTIVE, the Remote UE releases the PC5 unicast link. After that, it is up to UE implementation whether to perform cell selection, relay selection or both. [No inter-operability issue]

Discussion:

Qualcomm agree with the UE implementation aspect, but think it is not clear what the spec impact would be. In the current spec they understand that we already have triggering events for the relay UE to trigger the release, so they think this may not be necessary.

vivo tend to disagree with the proposal and have a similar view to Qualcomm; they see it as a remote UE implementation decision whether to keep or release the link. They indicate that in 23.304, the current requirement is that when in CM-IDLE, the UE may either release the link or not.

Xiaomi think the current spec is clear enough about the UE behaviour. MediaTek and Nokia have the same view.

ZTE agree with Qualcomm and think there is not a requirement to release the link.

OPPO had the understanding that the current spec required the UE to release the link but possibly re-establish afterwards. If we have no spec change, does it mean companies agree the link has to be released, or it is up to UE implementation?

Huawei think we could add a description to leave it to UE implementation whether to perform cell selection, relay selection, or both.

OPPO are in agreement that it is up to UE implementation for cell reselection, relay reselection, or both, but they are wondering about the link release. Huawei clarify that if the relay will anyway perform the release procedure, then we do not need to trigger the remote UE to do it.

Agreement:

Upon entering RRC\_IDLE/RRC\_INACTIVE, whether to release the PC5 unicast link is left to remote UE implementation (in the absence of any other triggering event that requires it to release the link), and it is up to UE implementation whether to perform cell selection, relay selection or both.

Wording to be discussed in email discussion [414].

Others：

[To be discussed] Proposal 8: RAN2 confirms for sidelink discovery reception the remote UE also needs to check remote UE AS-layer condition. [No inter-operability issue]

[To be discussed] Proposal 10: RAN2 to discuss whether to clarify in AS specifications that emergency services/limited service level is not supported by remote UE in Rel-17. [No inter-operability issue]

[To be discussed] Proposal 12: RAN2 to discuss the change in R2-2210170, i.e. “if T301 and T304 is are not running, initiate the RRC connection re-establishment procedure as specified in 5.3.7”. [No inter-operability issue]

P8/P10/P12 to be discussed in email discussion [414].

Optimizations/low priority issues (can discuss if time left)

Proposal 9: To discuss if the Remote UE can use pre-config for sidelink communication before acquisition of dedicated configuration of resource pool from network. [No inter-operability issue]

Proposal 14: To discuss if relay UE cannot send NotificationMessageSidelink message for intra-cell HO. [No inter-operability issue]

Proposal 15: To discuss if to reduce the delay of receiving remote UE’s paging message by connected Relay UE without CSS configured in active BWP, and the potential two options: [NW and UEs need to align the understanding]

a. Option 1: leave up to relay UE implementation to determine whether relay UE in RRC CONNECTED needs to be active at remote UE’s POs

b. Option 2: remote UE’s POs are defined as DRX active time for relay UE in RRC CONNECTED

Proposal 16: To discuss whether to trigger RAN1 to discuss a new solution in Rel-17 for relay scenario in order to allow OoC Remote UE select synchronization source other than cell if the network configures cell as reference source in SIB12.

The following documents will not be individually treated

[R2-2209377](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_draftCR_(Rel-17)_R2-2209377%20-%20Correction%20for%20U2N%20Relay.docx) Correction for U2N Relay OPPO draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

[R2-2209378](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209378%20-%20Discussion%20on%20left%20issues%20for%20CP_V2.docx) Discussion on left issues for CP OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2209500](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38304_draftCR_(Rel-17)_R2-2209500_Miscellaneous%20corrections%20for%20NR%20sidelink%20Relay_cl.docx) Miscellaneous corrections for NR sidelink Relay in TS 38.304 OPPO draftCR Rel-17 38.304 17.2.0 NR\_SL\_relay-Core

[R2-2209545](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209545.doc) Correction on relay UE RRC connection establishment failure SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2209775](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209775%20Discussion%20on%20control%20plan%20procedures%20for%20SL%20relay.doc) Discussion on remaining issues on CP procedure for SL Relay Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2209776](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209776%2038331_CR_R17_correction%20of%20UE%20handling%20of%20PC5%20RLC%20Channel%20configurations.docx) Correction on PC5 Relay RLC Channel configuration for L2 Relay UE and L2 Remote UE Apple CR Rel-17 38.331 17.2.0 3506 - F NR\_SL\_relay-Core

[R2-2209816](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209816_Discussion%20on%20NR%20SL%20communication%20transmission%20using%20exception%20pool%20during%20D2I%20path%20switch.docx) Discussion on NR SL communication transmission using exception pool during D2I path switch vivo discussion

[R2-2209817](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_CR3510_(Rel-17)_R2-2209817_Corrections%20to%20MAC%20and%20RLC%20handling%20for%20L2%20U2N%20Relay.docx) Corrections to MAC and RLC handling for L2 U2N Relay vivo CR Rel-17 38.331 17.2.0 3510 - F NR\_SL\_relay-Core

[R2-2209818](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_CR3511_(Rel-17)_R2-2209818_Correction%20to%20SL-RLC1.docx) Correction to SL-RLC1 vivo CR Rel-17 38.331 17.2.0 3511 - F NR\_SL\_relay-Core

[R2-2209847](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209847%20Clarification%20on%20SL%20DRX%20operation%20for%20U2N%20Remote%20UE.docx) Clarification on SL DRX operation for U2N Remote UE ASUSTeK CR Rel-17 38.331 17.2.0 3512 - F NR\_SL\_relay-Core

[R2-2209848](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209848%20Correction%20on%20RRC%20connection%20re-establishment%20procedure.docx) Correction on RRC connection re-establishment procedure ASUSTeK CR Rel-17 38.331 17.2.0 3513 - F NR\_SL\_relay-Core

[R2-2209860](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209860%20-%20Alignment%20between%20remote%20UE%20paging%20DRX%20and%20relay%20UE%20Uu%20DRX.docx) Alignment between remote UE paging DRX and relay UE Uu DRX Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2209861](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209861%20-%20Corrections%20to%2038321%20CR1417%20on%20alignment%20between%20remote%20UE%20paging%20DRX%20and%20relay%20UE%20Uu%20DRX.docx) Corrections to 38321 on alignment between remote UE paging DRX and relay UE Uu DRX Ericsson CR Rel-17 38.321 17.2.0 1417 - F NR\_SL\_relay-Core

[R2-2209879](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209879%20Correction%20on%20handover%20indication%20forwarding.docx) Correction on handover notification forwarding Xiaomi draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

[R2-2209880](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209880%20Miscelleneous%20correction%20on%2038.331.docx) Miscelleneous correction on 38.331 Xiaomi draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

[R2-2209885](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209885%20Correction%20on%20remote%20UE%20resource%20allocation.docx) Correction on remote UE's resource allocation Xiaomi draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

[R2-2209892](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_CR3515_(Rel-17)_R2-2209892%20-%20Calarification%20on%20emergency%20service%20support%20in%20Rel-17%20U2N%20relay.docx) Calarification on emergency service support in Rel-17 U2N relay CATT CR Rel-17 38.331 17.2.0 3515 - F NR\_SL\_relay-Core

[R2-2209902](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209902%20Discussion%20on%20SL%20synchronization%20for%20SL%20relay.doc) Discussion on SL synchronization for SL relay ZTE, Sanechips discussion Rel-17 NR\_SL\_relay-Core

[R2-2209903](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_draftCR_(Rel-17)_R2-2209903%20Correction%20on%20control%20plane%20for%20L2%20U2N%20relay-V2.docx) Correction on control plane for L2 U2N relay ZTE, Sanechips draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

[R2-2210170](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210170%20-%20CR3527%20Correction%20for%20receiving%20notification%20message%20during%20path%20switching%20v2.0.docx) Correction for receiving notification message during path switching Lenovo Information Technology CR Rel-17 38.331 17.2.0 3527 - F NR\_SL\_relay-Core

[R2-2210325](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38.331_CR3535(Rel-17)_R2-2210325-%20Clarification%20on%20UAC%20procedure%20for%20U2N%20Relay%20UE.docx) Clarification on UAC procedure for U2N Relay UE Ericsson CR Rel-17 38.331 17.2.0 3535 - F NR\_SL\_relay-Core

[R2-2210326](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38.331_CR3536(Rel-17)_R2-2210326-%20Clarification%20on%20setting%20the%20transaction%20identifier%20for%20sidelink.docx) Clarification on setting the transaction identifier for sidelink Ericsson CR Rel-17 38.331 17.2.0 3536 - F NR\_SL\_relay-Core

[R2-2210378](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210378%20Correction%20on%20SRAP%20handling%20for%20NR%20sidelink%20relay.docx) Correction on SRAP handling for NR sidelink relay Xiaomi CR Rel-17 38.331 17.2.0 3542 - F NR\_SL\_relay-Core

[R2-2210432](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210432%20Correction%20on%20derivation%20of%20serving%20Relay%20UE%20measurement%20results.doc) Correction on derivation of serving Relay UE measurement results Sharp discussion

[R2-2210433](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210433%20Correction%20on%20full%20configuration%20for%20remote%20UE.doc) Correction on full configuration for remote UE Sharp discussion

[R2-2210434](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210434%20Correction%20on%20RRC%20connection%20suspension%20of%20remote%20UE.doc) Correction on RRC connection suspension of remote UE Sharp discussion

[R2-2210494](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210494.docx) Remaining CP correction for sidelink relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2210495](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210495.docx) Discussion on support of QoE in L2 U2N relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2210496](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38331_CR3550_(Rel-17)_R2-2210496%20Clarification%20on%20no%20support%20of%20QoE%20for%20L2%20U2N%20Remote%20UE.docx) RRC CR for clarification on no support of QoE for L2 U2N Remote UE Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3550 - F NR\_SL\_relay-Core

[R2-2210625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210625-DraftCR_38304-SLRelayCorrections.docx) U2N relay related clarifications Nokia, Nokia Shanghai Bell draftCR Rel-17 38.304 17.2.0 F NR\_SL\_relay-Core

#### 6.7.2.3 User plane corrections

Including SRAP aspects and QoS.

Summary document

[R2-2210770](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210770%20-%20Summary%20of%20AI%206.7.2.3.docx) Summary of AI 6.7.2.3 OPPO discussion Rel-17 NR\_SL\_relay-Core

Proposal 1 R2 agree with the intention of change-4/5/7/8 of R2-2209904, change-1/2/3/5/7 of R2-2210043 and change in R2-2210673. Detailed wording can be further checked.

Discussion:

Huawei think the second part of change 4 in the ZTE CR is not correct, because the clause is for DL transmission and there should be no data received from the relay UE.

OPPO tend to agree that the wording of change 4 is not ideal, but think it can be checked offline.

Samsung agree with OPPO; they think the ZTE CR is in the right direction but think this will not lead to a major issue.

Agreement:

R2 agree with the intention of change-4/5/7/8 of R2-2209904, change-1/2/3/5/7 of R2-2210043 and change in R2-2210673. Detailed wording can be further checked in email discussion [420].

Proposal 2 R2 discuss on change-4/6 of R2-2210043, R2-2209893 and change-1/2/3/6 of R2-2209904.

To be discussed in email discussion [420].

* [AT119bis-e][420][Relay] Rel-17 SRAP CR (OPPO)

Scope: Check the wording of P1 from R2-2210770 and the content of P2, and develop a CR to 38.351.

Intended outcome: Report in R2-2210971 and agreeable CR in R2-2210972

Deadline: Friday 2022-10-14 1000 UTC

The following documents will not be individually treated

[R2-2209893](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38351_CR0010_(Rel-17)_R2-2209893%20-%20Correction%20on%20SRAP%20for%20L2%20U2N%20Relay.docx) Correction on SRAP for L2 U2N Relay CATT CR Rel-17 38.351 17.2.0 0010 - F NR\_SL\_relay\_enh-Core

[R2-2209904](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38351_draftCR_(Rel-17)_R2-2209904%20Correction%20on%20SRAP%20for%20L2%20U2N%20relay.docx) Correction on SRAP for L2 U2N relay ZTE, Sanechips draftCR Rel-17 38.351 17.2.0 F NR\_SL\_relay-Core

[R2-2210043](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210043_CR_to_38351.docx) Miscellaneous corrections to 38.351 Samsung R&D Institute UK CR Rel-17 38.351 17.2.0 0011 - F NR\_SL\_relay-Core

[R2-2210673](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210673%20DraftCR_38351%20Miscellaneous%20SRAP%20changes.docx) DraftCR 38.351 Miscellaneous SRAP changes Nokia, Nokia Shanghai Bell draftCR Rel-17 38.351 17.2.0 NR\_SL\_relay-Core

#### 6.7.2.4 Discovery and re- selection

Including 5G ProSe Direct Discovery for the non-relaying case. Re-using LTE discovery and re/selection as baseline.

Summary document

[R2-2210777](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210777%20Summary%20of%20AI%206.7.2.4%20on%20discovery%20and%20reselection.docx) Summary of AI 6.7.2.4 on discovery and reselection CATT discussion Rel-17 NR\_SL\_relay-Core

[Easy decision]

Proposal 1: Merge R2-2209501 into MAC rapporteur’s discussion for further discussion.

Proposal 2: Merge R2-2209894 into RRC rapporteur’s discussion for further discussion.

Proposal 4: Merge R2-2210169 into RRC rapporteur’s discussion for further discussion.

Discussion:

OPPO do not have a strong view on P2 but are unsure of the motivation; they understand that it is already mentioned that both AS layer and upper layer criteria are considered. They also understand that P4 is covered by the control plane discussion.

Apple observe that there is no MAC rapporteur CR yet.

CATT think P2 is needed; they understand the higher layer criteria may be met while the AS layer criteria are not. It is for the branch where no candidate relay UE is selected.

P2 to be handled in email discussion [414].

Lenovo are not sure that P4 is already covered; it is related to P5 from the CP discussion, but they understand that only cell selection is allowed according to the current text.

* [AT119bis-e][421][Relay] Rel-17 relay MAC CR (Apple)

Scope: Check the CR in R2-2209501.

Intended outcome: Agreed CR (without CB if possible)

Deadline: Friday 2022-10-14 1000 UTC

[To be discussed]

Proposal 3a: 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 3b: If proposal 3a 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 R2-2210111 as baseline.

Proposal 5a: RAN2 to discuss whether UE can use random selection on discovery/common pool, when the sensing result is not available, and random selection is also allowed by configuration.

Proposal 5b: If proposal 5a is agreed, RAN2 to discuss whether the procedure that UE can use random selection on discovery/common pool, when the sensing result is not available, and random selection is also allowed by configuration can be added. If yes, adopt TP in R2-2210633 as baseline.

Discussion:

vivo and MediaTek think P3a/P3b are too late for Rel-17. vivo also think the issue was previously discussed. Ericsson agree.

Huawei think the last time we had this discussion, the concern was whether discovery messages are periodic, and they now understand that they are. They consider that P3a/P3b are really needed.

* [AT119bis-e][422][Relay] Remaining proposals on discovery and (re)selection (CATT)

Scope: Discuss P3a/P3b/P5a/P5b of R2-2210777.

Intended outcome: Report to CB session in R2-2210908

Deadline: Friday 2022-10-14 1000 UTC

The following documents will not be individually treated

[R2-2209501](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38321_draftCR_(Rel-17)_R2-2209501_Miscellaneous%20corrections%20for%20NR%20sidelink%20Relay_cl.docx) Miscellaneous corrections for NR sidelink Relay in TS 38.321 OPPO draftCR Rel-17 38.321 17.2.0 NR\_SL\_relay-Core

[R2-2209894](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\38%20331_R2-2209894%20CR%233516(Rel-17)%20-%20Correction%20on%20relay%20(re-)selection%20for%20remote%20UE.docx) Correction on relay (re-)selection for remote UE CATT CR Rel-17 38.331 17.2.0 3516 - F NR\_SL\_relay\_enh-Core

[R2-2210111](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210111%20Support%20of%20SL%20CG%20for%20discovery%20message.docx) Support of SL CG for discovery message Huawei, HiSilicon, Nokia, Kyocera discussion Rel-17 NR\_SL\_relay-Core

[R2-2210169](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210169%20-%20CR3526%20Correction%20for%20relay%20selection%20for%20entering%20IDLE%20or%20INACTIVE%20v2.0.docx) Correction for relay selection for entering IDLE or INACTIVE Lenovo Information Technology CR Rel-17 38.331 17.2.0 3526 - F NR\_SL\_relay-Core

[R2-2210633](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210633_Disussion%20on%20resource%20allocation%20for%20sidelink%20discovery.docx) Discussion on Resource Allocation for Sidelink Discovery CATT discussion Rel-17 NR\_SL\_relay-Core

Withdrawn/Not available

R2-2209971 Correction on Sidelink discovery transmission CATT CR Rel-17 38.331 17.2.0 3520 - F NR\_SL\_relay-Core Withdrawn

## 6.11 NR positioning enhancements

(NR\_pos\_enh-Core; leading WG: RAN1; REL-17; WID: RP-210903)

Tdoc Limitation: 5 tdocs

### 6.11.1 Organizational

Rapporteur input. Incoming LS etc. This AI is reserved for rapporteur and organizational inputs. For LSes that need action or have impact beyond taking into account by CR rapporteurs: One tdoc by contact company (one company) to address the LS and potential reply is considered Rapporteur Input and may be provided. Related documents and proposed responses from companies other than the contact company should be submitted to the corresponding technical agenda item.

LS with “take into account” action

[R2-2209332](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209332_R4-2210603.docx) LS on Tx TEG framework (R4-2210603; contact: CATT) RAN4 LS in Rel-17 NR\_pos\_enh-Core To:RAN1, RAN2, RAN3

* Noted (email discussion [AT119bis-e][400])

LS on SRS-PosRRC-InactiveConfig and related documents

[R2-2209331](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209331_R3-225268.docx) LS on SRS-PosRRC-InactiveConfig configuration signalling (R3-225268; contact: Intel) RAN3 LS in Rel-17 NR\_pos\_enh-Core To:RAN2

[R2-2209611](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209611%20_Draft%20Reply%20LS%20on%20SRS-PosRRC-InactiveConfig%20configuration%20signalling.docx) Draft Reply LS on SRS-PosRRC-InactiveConfig configuration signalling Intel Corporation LS out Rel-17 NR\_pos\_enh-Core To:RAN3

[R2-2209610](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209610%20_RRC%20state%20transition-pos.docx) UE RRC state transition during the positioning session for RAN3 LS (R2-2209331) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2210119](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210119%20Discussion%20on%20the%20LS%20on%20SRS-PosRRC-InactiveConfig%20configuration%20signalling.doc) Discussion on the LS on SRS-PosRRC-InactiveConfig configuration signalling Xiaomi discussion

[R2-2209437](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209437%20Discussion%20on%20LS%20on%20SRS-PosRRC-InactiveConfig%20configuration%20signalling.docx) Discussion on LS on SRS-PosRRC-InactiveConfig configuration signalling CATT discussion Rel-17 NR\_pos\_enh-Core

* [AT119bis-e][408][POS] State change during positioning (Intel)

Scope: Discuss the LS in R2-2209331 and related contributions (R2-2209611 / R2-2209610 / R2-2210119 / R2-2209437), conclude on whether the state transition needs to be supported, and draft a reply.

Intended outcome: Report in R2-2210895 and approvable LS in R2-2210896

Deadline: Friday 2022-10-14 1000 UTC

LS on TEG framework and related documents

[R2-2209342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209342_R4-2214493.docx) Reply LS on the UE/TRP TEG framework (R4-2214493; contact: CATT) RAN4 LS in Rel-17 NR\_pos\_enh-Core To:RAN1, RAN2, RAN3

[R2-2209432](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209432%20Discussion%20on%20the%20Reply%20LS%20on%20the%20UETRP%20TEG%20framework%20from%20RAN4%20(R4-2214493).docx) Discussion on the “Reply LS on the UE/TRP TEG framework” from RAN4 (R4-2214493) CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2209433](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209433%20%5bDraft%5d%20Reply%20LS%20on%20applicability%20of%20timing%20error%20margin%20of%20Rx%20TEG.doc) [DRAFT] Reply LS on applicability of timing error margin of Rx TEG CATT LS out Rel-17 NR\_pos\_enh-Core To:RAN4 Cc:RAN1, RAN3

* [AT119bis-e][409][POS] LS on TEG framework (CATT)

Scope: Discuss the LS in R2-2209342 and related contributions in R2-2209432 and R2-2209433, and draft a reply.

Intended outcome: Report in R2-2210897 and approvable LS in R2-2210898

Deadline: Friday 2022-10-14 1000 UTC

Rapporteur CR

[R2-2210312](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210312%20RRCPositioning.docx) Miscellaneous correction for Positioning Ericsson CR Rel-17 38.331 17.2.0 3534 - F NR\_pos\_enh-Core

* [AT119bis-e][410][POS] Rel-17 positioning RRC CR (Ericsson)

Scope: Check the rapporteur CR in R2-2210312 and update it with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2210899

Deadline: Friday 2022-10-14 1000 UTC

R2-2210899 Miscellaneous correction for Positioning Ericsson CR Rel-17 38.331 17.2.0 3534 1 F NR\_pos\_enh-Core

### 6.11.2 Essential corrections

No documents should be submitted to 6.11.2. Please submit to 6.11.2.x.

#### 6.11.2.1 Stage 2 corrections

Including impact to 36.305 and 38.305. Stage 2 corrections without functional impact will be treated at lower priority or not at all.

[R2-2210313](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210313%20UE%20TxTEG.docx) Missing Functional Impacts for UE TxTEG association Ericsson CR Rel-17 38.305 17.2.0 0108 - F NR\_pos\_enh-Core

[R2-2210314](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210314%20RRC%20Inactive.docx) Missing Functional Impacts for RRC Inactive Positioning Ericsson CR Rel-17 38.305 17.2.0 0109 - F NR\_pos\_enh-Core

[R2-2210315](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210315%20SRS%20Port.docx) Addition of Signaling of SRS Port Index when SRS resource for MIMO is used Ericsson CR Rel-17 38.305 17.2.0 0110 - F NR\_pos\_enh-Core

[R2-2210605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210605%20Miscellaneous%20corrections%20to%20TS%2038.305.docx) Miscellaneous corrections to TS 38.305 vivo draftCR Rel-17 38.305 17.2.0 D NR\_pos\_enh-Core

#### 6.11.2.2 RRC corrections

Corrections to 38.331, except for UE capability issues which are handled under the UE capability agenda item.

[R2-2209429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209429%20Correction%20to%20RRC%20spec%20for%20RRC_INACTIVE%20positioning.docx) Correction to RRC spec for RRC\_INACTIVE positioning Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3485 - F NR\_pos\_enh-Core

* Endorsed (to be merged into the RRC rapporteur CR in email discussion [410])

Discussion:

Ericsson do not see this as an alignment to SDT but an enhancement to the field description; they think it could be captured as a procedural description in MAC. Huawei have no strong view but think the RRC change is enough.

Ericsson think the “if not configured” behaviour is already implied in MAC. Huawei think in any case the second change is needed.

Intel do not see the problem with copying the same sentence for SRS that is used for SDT.

[R2-2210480](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210480%20CR_cancellation%20of%20UL%20MAC%20CE%20for%20pre-MG.docx) Cancellation of UL MAC CE for MG activation/deactivation Samsung draftCR Rel-17 38.331 17.2.0 NR\_pos\_enh-Core

* To be considered in email discussion [410]

Discussion:

Samsung indicate that this was discussed last meeting and there was an understanding that this case was not captured in the current specification, but there was not time to agree on a fix then.

Huawei have the same understanding as Samsung.

vivo think the RRC does not need to be aware of the status of the MG in real time; it can consider the MG activated once it triggers the MAC to send the request. So they see the CR as not essential.

ZTE understand that this is already handled in the MAC spec, but they can accept the CR in RRC.

Qualcomm have the same view as vivo and see the text as a bit misplaced in the RRC spec.

CATT also think this is not essential because it covers a corner case.

Intel agree with Samsung and think the MAC layer does not currently know if LPP still needs the measurement gap or not. They understand that LPP indicates to the RRC layer, but we need to pass the indication on to MAC.

Nokia understand the RRC is not the right place to make this change and they would prefer to have it captured in MAC.

Apple think this is not essential.

OPPO agree with the intention and think this was effectively agreed in RAN2#117-e.

#### 6.11.2.3 LPP corrections

Corrections to 37.355.

Summary document

[R2-2210784](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210784_(Summary%20of%20AI%206.11.2.3%20LPP%20Corrections)_v1.docx) Summary of AI 6.11.2.3: LPP corrections Qualcomm Incorporated discussion Rel-17 NR\_pos\_enh-Core

[Proposed to agree with cleanup]

Proposal 1: The CR in 'R2-2209430, "Correction to UE capability for DL-AoD", Huawei, HiSilicon' is an essential correction. Agree a revision of the CR with the editorial issues fixed.

Proposal 3: The changes related to capability indices 23-3-3, 27-12, and 27-4-1 in 'R2-2209436, "Corrections on the LPP capabilities", CATT ' are essential corrections. Agree a revision of the CR with the change for 27-20 removed, and with the Note for 27-4-1 removed from DL-AoD.

Proposal 6: The CR in 'R2-2209683, "NR-DL-AoD-SignalMeasurementInformation corrections", Nokia, Nokia Shanghai Bell' is an essential correction. Revise the CR using the latest version of the specification.

Proposal 7: The CR in 'R2-2210199, "Correction on the maximum number of SRS and TxTEG association", ZTE, Sanechips' is an essential correction. Convert the CR into a backwards compatible change by clarifying in an ASN.1 comment that the applicable value is 64. Add the "Isolated Impact" statement to the CR cover sheet.

Discussion:

Lenovo think on P7, the change as proposed is one way to do it, but it could also be in the field description. Intel think we should take a BC change and are OK with the ASN.1 comment.

Huawei agree with Lenovo that the field description would be a better place. On P1, Huawei indicate the proposal is BC, but they think there might be a need for a separate CR for visibility due to interoperability considerations. On P6, Huawei wonder if there is Rel-16 impact; they are OK with a Rel-17 CR but think we could consider a Rel-16 version next meeting.

CATT think on P6, “associated with a single TRP” should be deleted in the description, because the IE is already per-TRP. Nokia think this may be clear from the ASN.1, but an explicit clarification is useful.

Agreements:

Proposal 1: The CR in 'R2-2209430, "Correction to UE capability for DL-AoD", Huawei, HiSilicon' is an essential correction. Agree a revision of the CR with the editorial issues fixed.

Proposal 3: The changes related to capability indices 23-3-3, 27-12, and 27-4-1 in 'R2-2209436, "Corrections on the LPP capabilities", CATT ' are essential corrections. Agree a revision of the CR with the change for 27-20 removed, and with the Note for 27-4-1 removed from DL-AoD.

Proposal 6: The CR in 'R2-2209683, "NR-DL-AoD-SignalMeasurementInformation corrections", Nokia, Nokia Shanghai Bell' is an essential correction. Revise the CR using the latest version of the specification.

Proposal 7: The CR in 'R2-2210199, "Correction on the maximum number of SRS and TxTEG association", ZTE, Sanechips' is an essential correction. Convert the CR into a backwards compatible change by clarifying in an ASN.1 comment that the applicable value is 64. Add the "Isolated Impact" statement to the CR cover sheet.

Details of all proposals to be checked in email discussion [416].

[Proposed non-essential]

Proposal 2: The CR in 'R2-2209435, "Change Request of missing UE capabilities", CATT ' is not an essential correction.

Agreement:

Proposal 2: The CR in 'R2-2209435, "Change Request of missing UE capabilities", CATT ' is not an essential correction.

[To discuss—related to email discussion [AT119bis-e][409]]

Proposal 4a: RAN2 to discuss whether the "Applicability of timing error margin of Rx TEG" as included in the RAN4 LS R2-2209168 (R4-2214493) needs to be specified in LPP.

If yes, discuss whether the specification is applicable to both, NR-DL-TDOA-SignalMeasurementInformation and NR-Multi-RTT-SignalMeasurementInformation [2] or only applicable to NR-DL-TDOA-SignalMeasurementInformation [3].

Proposal 4b: Ask RAN4 whether the "Applicability of timing error margin of Rx TEG" as included in the RAN4 LS R2-2209168 (R4-2214493) needs to be specified in LPP.

Discussion:

CATT clarify that these issues have already been captured in email discussion [409].

Huawei think we do not need to ask RAN4 whether to capture it; we either indicate that we are capturing it in our spec or ask RAN4 to capture it in theirs. They see the important question as whether the sentence is applicable to multi-RTT.

Qualcomm indicate that the TPs include a reference to 38.133, but it has been clarified that this is not specified in 38.133 and we cannot meaningfully reference it; so some clarification is needed.

CATT have a similar view to Qualcomm that there is no frequency drift margin or group delay margin in the RAN4 spec, so they see that an LS to RAN4 is needed. They think we need further clarification from RAN4 on what to capture in the multi-RTT case.

To be discussed under email discussion [409].

[To discuss—other]

Proposal 5: RAN2 to discuss whether the additional text proposed in [4]:

"In this version of the specification, the field is mandatory present…"

for the field nr-UE-RxTEG-TimingErrorMargin in IE NR-DL-TDOA-SignalMeasurementInformation, and for the fields nr-UE-TxTEG-TimingErrorMargin and nr-UE-RxTxTEG-TimingErrorMargin in IE NR-Multi-RTT-SignalMeasurementInformation is an essential correction or not.

Discussion:

CATT understand that for a UE that supports version 17.2.0, the absence means “maximum applicable value”. However, they point out there is an LS from RAN4 saying that the margin is provided as LPP signalling parameters, and they think in light of the LS absence does not now make sense.

Huawei think the added text is contradictory to the current text, because we already have “if absent” behaviour and the new text makes it mandatory present. They understand that RAN4’s intention is that the UE must report the TEG margin, but they did not say it has to be included explicitly; we can define a default value.

ZTE agree with Huawei and think we discussed whether this field was mandatory or optional last meeting, and we settled on the current behaviour to avoid an NBC change. So they see no need for the change.

vivo agree that the CR is not needed.

Nokia think the RAN4 spec has section 10.1.23.2 where they identify the maximum value, and if we need a clarification in LPP we should revisit the issue next meeting and consider whether a change is needed in light of the RAN4 spec. They do not see the CR as needed now.

Intel agree with Huawei.

Qualcomm understand it is true that the RAN4 spec captures the measurement accuracy requirement margins in a table, but not the TEG margins, which capture the group delay errors. They think we are discussing two separate issues and the reference to 38.133 may be inappropriate at the moment, but this aspect can be discussed in email discussion [409]. On the signalling of the value, they agree with other companies that absence means maximum value.

Agreement:

RAN2 confirm that for the field nr-UE-RxTEG-TimingErrorMargin in IE NR-DL-TDOA-SignalMeasurementInformation, and for the fields nr-UE-TxTEG-TimingErrorMargin and nr-UE-RxTxTEG-TimingErrorMargin in IE NR-Multi-RTT-SignalMeasurementInformation, absence of the fields indicates the maximum value and the fields do not need to be made mandatory.

Proposal 8: RAN2 to discuss whether the following Proposal in 'R2-2210606, "Discussion on the provision of AL for achievable TIR calculation", vivo.' is an essential correction or not:

"Alert Limit (AL) should be provided to the UE to optionally obtain the achievable TIR."

Discussion:

Qualcomm think this is new functionality and could be discussed in Rel-18; they do not see it as a correction and think a capability would be needed.

CATT agree with Qualcomm and think there is no clear definition today of “achievable TIR”. They would prefer that we look at this in Rel-18.

Ericsson support the proposal from vivo and think if we do not provide the AL, the UE should be able to indicate if it can achieve some other TIR. They also consider that the use cases provided last meeting are valid.

ZTE think the AL is not needed to compute achievable TIR; it is also possible that the UE reports PL>AL.

vivo intended to clarify the achievable TIR; they understand that there is a mathematical relationship between PL and IR, and the UE is not able to provide meaningful information to the LMF without the AL.

Apple think this can be discussed in Rel-18.

OPPO agree the AL should be signalled to the UE; the UE should receive the TIR and respond by calculating the PL, and the UE may need to indicate the achievable TIR with that PL.

Swift think there are valid points in the tdoc and a short email discussion might help.

* [AT119bis-e][416][POS] LPP CR (Qualcomm)

Scope: Merge the agreed LPP changes into a rapporteur CR.

Intended outcome: Report in R2-2210905 and agreeable CR in R2-2210904

Deadline: Friday 2022-10-14 1000 UTC

* [AT119bis-e][417][POS] Calculation of TIR and provision of AL to UE (vivo)

Scope: Discuss the proposal from R2-2210606 and conclude on a way forward.

Intended outcome: Report to CB session in R2-2210906

Deadline: Friday 2022-10-14 1000 UTC

The following documents will not be individually treated

[R2-2209430](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209430%20Correction%20to%20UE%20capability%20for%20DL-AoD.docx) Correction to UE capability for DL-AoD Huawei, HiSilicon CR Rel-17 37.355 17.2.0 0379 - F NR\_pos\_enh-Core

[R2-2209431](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209431%20Correction%20to%20TEG%20margin%20reporting.docx) Correction to TEG margin reporting Huawei, HiSilicon CR Rel-17 37.355 17.2.0 0380 - F NR\_pos\_enh-Core

[R2-2209434](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\37355_CR0383_(Rel-17)_R2-2209434.docx) Corrections on the timing error margins CATT discussion Rel-17 37.355 NR\_pos\_enh-Core Late

[R2-2209435](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\37355_CR0384_(Rel-17)_R2-2209435.docx) Change Request of missing UE capabilities CATT discussion Rel-17 37.355 NR\_pos\_enh-Core Late

[R2-2209436](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\37355_CR0385_(Rel-17)_R2-2209436.docx) Corrections on the LPP capabilities CATT discussion Rel-17 37.355 NR\_pos\_enh-Core Late

[R2-2209683](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209683%20CR%20LPP%2037355%20DL-AoD%20v2.docx) NR-DL-AoD-SignalMeasurementInformation corrections Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.2.0 0381 - F NR\_pos\_enh-Core

[R2-2210199](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210199%20Correction%20on%20the%20maximum%20number%20of%20SRS%20and%20TxTEG%20association.docx) Correction on the maximum number of SRS and TxTEG association ZTE, Sanechips CR Rel-17 37.355 17.2.0 0382 - F NR\_pos\_enh-Core

[R2-2210606](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210606%20Discussion%20on%20the%20provision%20of%20AL%20for%20achievable%20TIR%20calculation.docx) Discussion on the provision of AL for achievable TIR calculation vivo discussion Rel-17 NR\_pos\_enh-Core

#### 6.11.2.4 MAC corrections

Corrections to 38.321.

[R2-2209427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209427%20Correction%20to%20MAC%20spec%20for%20Positioning%20enhancement.docx) Correction to MAC spec for Positioning enhancement Huawei, HiSilicon CR Rel-17 38.321 17.2.0 1408 - F NR\_pos\_enh-Core

Discussion:

Huawei indicate this CR intends to align with the CG-SDT agreements. When contention resolution is successful with 2-step RACH, the CG-SDT TAT shall be restarted, while for SRSp, it might happen that during the SRS transmission there is a 2-step RACH in parallel and the TAT should be updated.

Ericsson agree with the CR, but they wonder if the network will always configure this timer, and if so, whether we should have something in the field description to this effect in RRC. Can be discussed by email.

* [AT119bis-e][418][POS] Positioning MAC CR (Huawei)

Scope: Merge agreed MAC changes for Rel-17 positioning into a rapporteur CR.

Intended outcome: Report in R2-2210891 and agreeable CR in R2-2210894

Deadline: Friday 2022-10-14 1000 UTC

[R2-2210311](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210311%20MAC%20CR.docx) Positioning Measurement Gap Activation/Deactivation Request MAC CE based upon Scheduling Request Configuration Ericsson CR Rel-17 38.321 17.2.0 1429 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

Samsung do not support the CR; they think the correction implies that the UE can transmit the MAC CE only when there is a dedicated SR configuration, which is not in line with what we agreed.

Huawei have the same view as Samsung. Also Intel and CATT.

OPPO have a similar view that the UE can RACH if there is no dedicated SR. ZTE agree with Samsung.

Ericsson think we agreed last meeting that this is needed, and they think the RACH is something different. They understand that having the preconfigured MG is not enough; the network should also have provided the dedicated SR configuration.

[R2-2210607](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210607%20Clarification%20on%20the%20PPW%20index.docx) Clarification on the PPW index vivo draftCR Rel-17 38.321 17.2.0 D NR\_pos\_enh-Core

Discussion:

Huawei think this addresses an editorial issue; they partially agree with the change but think it can be discussed in the email discussion.

CATT wonder if the second correction really is common understanding in our specification; they did not find the term “addition time” elsewhere. They think this part is not an essential correction.

Ericsson thought that based on serving cell ID we have some indexing, and the “addition time” is confusing. They would prefer a different phrasing.

Nokia think this list management behaviour should be in RRC, not MAC.

To be considered in email discussion [418].

#### 6.11.2.5 UE capabilities

Including impact to 38.306 and any UE-capability-specific impact to 38.331.

[R2-2209428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209428%20Correction%20on%20PRS%20processing%20window%20capability.docx) Correction on PRS processing window capability Huawei, HiSilicon CR Rel-17 38.306 17.2.0 0806 - F NR\_pos\_enh-Core

* Postponed

Discussion:

Lenovo think the CR makes a significant change, and they wonder if RAN1 will update the feature list to reflect the agreement. Huawei are not sure if RAN1 will update the list, but the intention of the CR is to align with RAN1’s description.

Intel agree with the intention of the CR but also see Lenovo’s point and would like to postpone and check internally.

Nokia understand this is also being discussed in RAN1.

[R2-2210310](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210310%20capability.docx) Correcting PRS capability information reported to gNB Ericsson CR Rel-17 38.306 17.2.0 0815 - F NR\_pos\_enh-Core

Discussion:

Qualcomm do not follow why NOTE 3 is voided in the CR. They understand that table NOTEs are normative. Intel have the same understanding. Lenovo have the same view, and they agree the current description is a bit confusing, but think it can be discussed offline.

Nokia have the same view as Qualcomm, so they do not see the deletion of NOTE 3 as essential.

* [AT119bis-e][419][POS] PRS capability information (Ericsson)

Scope: Check and update the CR in R2-2210310.

Intended outcome: Agreeable CR in R2-2210907

Deadline: Friday 2022-10-14 1000 UTC

R2-2210907 Correcting PRS capability information reported to gNB Ericsson CR Rel-17 38.306 17.2.0 0815 1 F NR\_pos\_enh-Core

# 8 Rel-18

## 8.2 Expanded and improved NR positioning

(FS\_NR\_pos\_enh2; leading WG: RAN1; REL-18; WID: RP-221814)

Time budget: 2 TU

Tdoc Limitation: 4 tdocs

### 8.2.1 Organizational

Including incoming LSs and rapporteur inputs.

Workplan

[R2-2209588](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209588%20Work%20Plan%20for%20Study%20Item%20on%20Expanded%20and%20Improved%20NR%20Positioning.docx) Work Plan for Study Item on Expanded and Improved NR Positioning CATT, Intel Corporation, Ericsson Work Plan FS\_NR\_pos\_enh2

* Noted (email discussion [AT119bis-e][400])

Terminology alignment LS and related documents

[R2-2209351](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Docs\R2-2209351.zip) LS on Terminology Alignment for Ranging/Sidelink Positioning (S2-2207129; contact: Xiaomi) SA2 LS in Rel-18 FS\_Ranging\_SL To:RAN1, RAN2, RAN3 Late

[Terms defined in SA2 “and some of them are either aligned or mapped with RAN definitions”]

Ranging, SL Reference UE, Target UE, Assistant UE, Located UE, Sidelink Positioning, Positioning, Relative position

[Additional terms defined in SA2]

SL Positioning Server UE, SL Positioning Client UE, Network-assisted Operation, and UE-only Operation

Discussion:

Xiaomi think there is some misalignment between RAN2 and SA2 terminology, and for the terms that are not defined in RAN2, we have to decide what we adopt from SA2 and where/whether we ask them to change.

CATT think RAN2 can focus on the terms in RAN SI scope, and they would prefer to keep the terms that are already agreed in RAN1/RAN2 (e.g., target and anchor UEs). For the new terms from SA2, they do not want to introduce them (e.g., located UE can be integrated into anchor UE).

Huawei think we can continue using the RAN1/RAN2 terms, but for SA2’s terminology, we can tell them what the corresponding RAN term is rather than ask them to correct their terms (this is up to them). They see the reference UE corresponding to the anchor UE in relative positioning, and the located UE corresponding to the anchor UE in absolute positioning, and they see this as a mistake in the SA2 TR.

Intel indicate that multiple groups are working on these issues and we should avoid duplicated discussions; last meeting we agreed to follow SA2/RAN1 on the terminology and SA2 on the architecture. They think we could ask for clarification of terms that are unclear, but we can leave the selection of terminology itself to RAN1 and SA2 and not discuss in parallel.

Ericsson agree with CATT that we should try to consolidate terms. On the SL Positioning Server UE, they understand that SA2 do not have a use case or a justification for why it is needed, and they do not see the need. Chair points out that we agreed last meeting to follow SA2 on this.

Xiaomi also understand that we have agreed to follow SA2 on the server UE. They also agree with Intel that we should avoid parallel discussions, but they think RAN2 can provide our views on the terminologies that are related only to RAN2 procedures, without coming into conflict with RAN1, and indicate what functionalities we understand are needed.

Lenovo share Ericsson and CATT’s view about focussing on the RAN-defined and -agreed concepts, and they see that some of these UE types may be combined (e.g. reference UE==anchor UE). For the “network-assisted” and “UE-only” operation, they think we need clarification about whether mixed scenarios are supported: e.g., configuration at the network and computation at the UE.

Vodafone agree with Intel’s comment and think the worst outcome would be that everyone defines their own terminology for the same thing. If there are technical questions related to the terminology, they can be asked, but we should not push a general view from RAN2.

CATT think we could discuss the use case for the assistant UE, but the technical details may be out of our scope since it concerns two UEs without a direct sidelink connection.

vivo think RAN2 can focus on target/anchor/server UEs and on the functionalities related to RAN2. On Intel’s concern about misalignment, they think the description of the terminologies can be aligned between different WGs in combination.

OPPO think we should follow last meeting’s agreement to follow SA2 definitions, and based on this, they think we could investigate the UE roles case by case. They think the assistant UE may need to be discussed in RAN2 since it involves SL measurement configuration from the assistant UE towards the other involved UEs.

* [AT119bis-e][423][POS] LS to SA2 on SL positioning terminology (Xiaomi)

Scope: Discuss the LS in document R2-2209351 and develop a response.

Intended outcome: Report in R2-2210909 and agreeable LS in R2-2210910

Deadline: Friday 2022-10-14 1000 UTC (for comments)

[R2-2210040](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210040%20Discussion%20on%20Terminology%20alignment%20with%20SA2.doc) Discussion on Terminology alignment with SA2 Xiaomi discussion Rel-18

[R2-2210041](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210041%20Draft%20Reply%20LS%20on%20Terminology%20Alignment%20for%20Ranging%20&%20Sidelink%20Positioning_V2.docx) Draft Reply LS on Terminology Alignment for Ranging & Sidelink Positioning Xiaomi LS out Rel-18 To:SA2 Cc:RAN1, RAN3

[R2-2209402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209402%20Draft%20Reply%20LS%20on%20Terminology%20Alignment%20for%20RangingSidelink%20Positioning.doc) Draft Reply LS on Terminology Alignment for Ranging/Sidelink Positioning CATT LS out Rel-18 FS\_NR\_pos\_enh2 To:SA2 Cc:RAN1, RAN3

### 8.2.2 Sidelink positioning

Study of positioning architecture and signalling procedures (e.g. configuration, measurement reporting, etc) to enable sidelink positioning covering both UE based and network based positioning. Considering relative positioning, ranging and absolute positioning.

Email discussion report

[R2-2209607](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209607_Report_%5bPost119-e%5d%5b406%5d%5bPOS%5d%20Sidelink%20positioning%20protocol%20issues%20(Intel).docx) Report of email discussion 406 on sidelink Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2 Late

Proposal 1: For sidelink positioning procedures between UE and LMF for the case of hybrid (Uu + PC5) based positioning in case of in-coverage, RAN2 is proposed to discuss and select between the following options:

1. Extension of LPP, whereby new signaling shall be defined to support hybrid Uu and PC5 based positioning, i.e. extend the existing LPP to support sidelink based positioning between UE and LMF

2. Enhancement of LPP whereby SLPP/RSPP signaling can be transported within LPP transparently, i.e. use the newly defined SLPP/RSPP to support sidelink based positioning and use the existing LPP to support Uu based positioning; and the SLPP/RSPP is carried as a container in LPP

Discussion:

Xiaomi prefer option 1 and see the extension as easy since LPP is structured per positioning method; they think option 2 will have more signalling overhead.

CATT think that for the hybrid case, the LMF is involved anyway, but option 2 can be a baseline for in-coverage cases. They see a lot of impact to LPP from extending it as in option 1, because it creates dependency between LPP and SLPP/RSPP.

Qualcomm do not see why the option of using SLPP/RSPP between the UE and the LMF is omitted; they agree with CATT that option 1 is the least preferred, and they see this as repeating a mistake from Rel-13 where we migrated material from LPPe into LPP and created a big code footprint needlessly. They find option 2 acceptable (similar to LPPe), but think it still has the disadvantage that you have to support LPP for SL-only devices (more related to P2). They do not see why we should have different solutions for different coverage scenarios, but in any case they do not think we need to agree now; we can develop SLPP/RSPP and look at what the options would imply in practice.

Huawei note that this proposal is for the hybrid case only, so they understand that LPP will need to be supported, and in this case the most efficient way would be to introduce a container and avoid duplicated signalling. However, on the PC5-only case (P2), they agree with Qualcomm that the UE should not have to support LPP.

Chair wonders if we should have divergence between the hybrid and PC5-only cases.

Lenovo agree with Qualcomm that we do not need to decide on signalling details in the study phase; we need to see what kind of parameters need to be signalled and then decide what option makes sense. For the study we can acknowledge that the options have pros and cons, and they can be considered during the WI phase.

OPPO think option 2 is weird: Conventionally, when a container is used, it is not opened by the receiving entity, as with the gNB forwarding the LPP container transparently. They also wonder why we would not support option 1 with SL positioning as a new method. The

Ericsson can agree to down-select in the normative phase. From the network side, they see the hybrid and PC5-only cases as somewhat the same; the question is whether the LMF should support SLPP/RSPP at all. So they prefer option 1 and see containerisation as a bit complicated.

OPPO, Apple, and MediaTek agree to down-select in the normative phase.

Apple wonder about other options such as supporting SLPP/RSPP to the LMF in this case. Xiaomi also have sympathy for this suggestion.

Vodafone are OK to select in the WI phase, but in general, they think that the dependencies between the protocols have to be justified, so they would prefer the container in option 2.

Proposal 2: For sidelink positioning procedures between UE and LMF for the case of PC5-only based positioning in case of in-coverage, RAN2 is proposed to discuss and select between the following options:

1. Extension of LPP, whereby new signaling shall be defined to support PC5 based positioning, i.e., extend the existing LPP to support sidelink based positioning between UE and LMF

2. Enhancement of LPP whereby SLPP/RSPP signaling can be transported within LPP transparently, i.e. use the newly defined SLPP/RSPP to support sidelink based positioning and SLPP/RSPP signaling is carried as a container in LPP

Agreement:

Protocol options between UE and LMF for hybrid PC5+Uu positioning and PC5-only positioning in-coverage are studied and RAN2 will down-select during normative work.

1. Extension of LPP, whereby new signaling shall be defined to support hybrid Uu and PC5 based positioning, i.e. extend the existing LPP to support sidelink based positioning between UE and LMF

2. Enhancement of LPP whereby SLPP/RSPP signaling can be transported within LPP transparently, i.e. use the newly defined SLPP/RSPP to support sidelink based positioning and use the existing LPP to support Uu based positioning; and the SLPP/RSPP is carried as a container in LPP

3. Use of SLPP/RSPP between the UE and the LMF

Proposal 3: In order to enable sidelink positioning, SLPP/RSPP shall support at least the following functionalities:

1. SL Positioning Capability Transfer

2. SL Positioning Assistance Data exchange

3. SL Location Information Transfer

4. Error handling

5. Abort

Discussion:

Samsung support the proposal.

Ericsson think it is fine to capture this, but they do not want to move into the “server UE” paradigm.

ZTE are fine with the proposal but would like to clarify whether items 2 and 3 require both the “request” and “provide” messages.

Agreement:

Proposal 3 (modified): In order to enable sidelink positioning, SLPP/RSPP shall support at least the following functionalities:

1. SL Positioning Capability Transfer

2. SL Positioning Assistance Data exchange

3. SL Location Information Transfer

4. Error handling

5. Abort

This agreement does not imply any specific signalling structure.

Proposal 4: At least the following procedures shall be defined for SLPP/RSPP using corresponding LPP procedures (and associated signaling) as baseline:

1. SLPP Capability Transfer procedure

2. SLPP Assistance Data Transfer procedure

3. SLPP Location Information Transfer procedure

4. Error handling

5. Abort

Discussion:

ZTE are not sure if request and response are required for all cases.

vivo think the “baseline” terminology is ambiguous, and they think the detailed signalling can be discussed in normative phase.

Qualcomm would also be OK to discuss this in WI phase, but they understand in the end we will have solicited and unsolicited procedures depending on the needed functionality.

Proposal 5: Unicast/one-to-one operation is assumed as baseline for exchange of sidelink positioning signaling.

Proposal 6: RAN2 shall focus on applicability of at least the following positioning signaling for groupcast/broadcast (in addition to unicast). FFS the specific use case and any security aspects:

• SL positioning capability transfer

• SL positioning assistance data

Discussion:

Huawei are fine with P5, and on P6 they think the wording needs some modification to say “RAN2 shall study the applicability”. They wonder if this information would be included in the DCR message. In the legacy operation, PC5 UE capability is only transferred after the link is established, so adding groupcast/broadcast would be a big change; they wonder if there is a security concern.

CATT have a big concern on P6 for security reasons. The groupcast and broadcast communication do not have security and the positioning capability may need to be protected.

Lenovo think P5 could be easily agreeable, and they agree that there could be a security concern with groupcast/broadcast. However, they see use cases where the information is needed among multiple group members, so they can support further study. Also wonder if we should coordinate with SA3.

Intel clarify the intention of P6 is just to study, and the use cases are intentionally left FFS; they see cases where unicast makes sense and cases where broadcast makes sense, but they acknowledge the security concern.

CATT think it is clear that the positioning signalling that should be protected cannot be transmitted by groupcast/broadcast.

MediaTek wonder about the reliability of broadcast, where it would not be known if the receiver received the message.

Apple support P6 with the security concerns included. Nokia agree with Apple.

Xiaomi think we could also include location transfer in P6, and if the main concern is about security, they think we can discuss the issues. LG and Qualcomm agree with Xiaomi.

Agreements:

Proposal 5: Unicast/one-to-one operation is assumed as baseline for exchange of sidelink positioning signaling.

Proposal 6 (modified): RAN2 shall study applicability of at least the following positioning signaling for groupcast/broadcast (in addition to unicast), including addressing any security aspects (involving SA3 where needed). FFS the specific use case:

• SL positioning capability transfer

• SL positioning assistance data

• FFS SL location information transfer

Other documents

[R2-2210363](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210363_(Sidelink%20Positioning).docx) Study of Sidelink Positioning Architecture, Signaling and Procedures Qualcomm Incorporated discussion

Proposal 1 A UE supporting sidelink positioning and ranging should be capable of being enabled with the ability to calculate position and or range based on sidelink positioning and ranging measurements.

Discussion:

Chair wonders if all UEs supporting SL positioning would be required to support calculating the position. Qualcomm intend that we should not preclude any UEs from supporting it. So the intention is not to require calculation function in every UE, but to clarify that the spec does not preclude it.

Ericsson agree with the intention that the UE should be able to compute the position/ranging. Chair points out that SA2 have a server definition that includes calculating the position. Ericsson think this may not be a stable decision and they do not see a use case for it.

CATT think it depends on the capability of UEs, and we should be open to support different kinds of devices, e.g., a lower-capability UE with no computation engine.

Qualcomm think the comments from Ericsson and CATT are both reasonable; the intention is not to exclude specific functionality but to make sure that the specs do not constrain the implementation.

Intel and CMCC agree with CATT. Xiaomi think it is an SA2 decision, depending on what SA2 decides about the server UE concept.

OPPO want to delete the “should be capable” language; they agree with CATT that it should not be mandatory functionality.

Huawei wonder if this means we support both UE-based and UE-assisted SL positioning (in RAN language).

Xiaomi understand the proposal is that if the UE supports calculating the location, it can be configured to enable this functionality.

Intel think we normally discuss capability based on RAN1 input. MediaTek think the suggested agreement does not read clearly.

[RSPP/SLPP transport]

Proposal 2: RAN2 should support SLPP transport over PC5 User Plane to provide SLPP QoS and flexibility in cast type while introducing no change to the PC5 reference point.

Discussion:

Ericsson think it is too early and should perhaps be an SA2 decision.

Huawei also think it is too early to decide between CP and UP transport and would prefer to wait for SA2.

Xiaomi support the proposal, and understand that SA2 want RAN2 to make this decision.

Apple agree with Xiaomi and think the protocol stack is in our scope.

Qualcomm share Apple’s view that this is a RAN2 protocol issue.

Spreadtrum support the proposal and agree with Apple and Xiaomi. They support transport of SLPP over PC5-U as an SRB.

CATT think CP for SLPP is the baseline because it aligns with the legacy LPP operation. They see that SLPP over PC5-U to provide QoS would be out of RAN2 scope and more SA2 business. Qualcomm think there are well-defined QoS mechanisms as described in the paper that can be used.

Intel also have a concern that there will be SA2 impact from such a decision. For example, if we use PC5-S, it forces us to use unicast and requires connection setup between the UEs.

[Architecture]

Proposal 3: The UE Positioning Architecture applicable to NG-RAN should not introduce additional entities/nodes (e.g., "anchor UE", "server UE", "target UE", etc.) and should be applicable to all coverage scenarios (e.g., no separate architecture for in-coverage or out-of-coverage scenarios is needed).

Proposal 4: Extend the UE Positioning Architecture applicable to NG-RAN as shown in Figure 6.

[RSPP/SLPP design]

Proposal 5: SLPP should support session-based operation and session-less operation. SLPP session-based operation includes session establishment among a group of UEs, session modification to add or remove UEs and session termination. Session-less operation enables sidelink positioning with no discovery, no UE associations an no SLPP session.

CATT want to clarify understanding: Once UEs are involved in a session, addition and removal of a UE would not happen. They think this case is not considered in RAN1 and may be too complex for the first release.

Xiaomi wonder if duplicate detection would be applicable if there is no session.

Lenovo think it would be straightforward to support session-based for the first release, since it is already known from LPP how it would work. For sessionless, they are not clear on how it works and which entity initiates sessionless operation.

ZTE think we should prioritise session-based operation. They have a concern about broadcast of location measurements in sessionless operation.

Huawei think this is outside RAN2 scope, because the session is related to the LCS layer rather than to SLPP/RSPP. They also think the addition and removal of UEs would be a service-layer procedure.

Nokia think we should understand broadcast and preconfiguration first, to understand if there is a real need for the sessionless approach. Without a session they are concerned that we would run into reliability issues.

OPPO think that sessionless is too complex for this release.

Apple think sessionless is important: In practice it may be more useful than session-based, based on how similar technologies have been defined in 802.11, for example. They are concerned that session-based could become a paper spec. LG also think sessionless is more important and session-based is more complex because of the group maintenance procedures.

Proposal 6: Sidelink positioning protocol (SLPP) should support centralized operation, where one UE performs position/range computation based on shared measurement/location information, and distributed operation, where all participating UEs perform position/range computation.

Discussion:

Xiaomi think this could be discussed along with the LS on terminology.

CATT support P6 and think that the two operations have their own benefits. The distributed architecture could apply when not all anchor UEs are connected with each other, which could reduce deployment cost.

OPPO are confused with this proposal: Why should all participating UEs perform position computation? They understand that only one UE should do the computation, not, e.g., both endpoints of an SL-PRS transmission. Nokia agree with OPPO and would prefer that we speak of “multiple UEs” rather than “all UEs”.

LG have a concern on the use case for all UEs, and also wonder for the centralized operation if it means the UE is working in an LMF role instead of target UE. In general they find the proposal not clear.

Qualcomm think because of the nature of SL, the UEs should not be precluded from doing this computation. For example, an RSU might compute (centralized) or a mobile UE might compute (distributed). They think there are use cases for multiple calculation functions, e.g., to save a specific UE from the processing overhead.

Apple support the proposal.

Xiaomi indicate that SA2 are also considering cases with multiple server UEs, so we may be able to ask SA2 to clarify the situation.

* [AT119bis-e][424][POS] SLPP/RSPP protocol design (Qualcomm)

Scope: Continue discussion of P5/P6 of R2-2210363 and attempt to converge. Focus on what the use cases are and the functionalities that need to be supported by the protocol design.

Intended outcome: Report to CB session in R2-2210911

Deadline: Friday 2022-10-14 1000 UTC

[Supplementary services/LCS service types]

Proposal 7: Support a MO-LR or a new supplementary services operation for UE initiated SLPP transactions towards an LMF.

Proposal 8: Support a MT-LR or a new supplementary services operation for LMF-initiated SLPP transactions towards a UE.

[Potential overlap with R2-2209607]

Proposal 9: Support hybrid Uu, SL, and RAT-independent positioning by jointly using the SLPP, LPP, and NRPPa procedures.

Proposal 10: SLPP should support at least the three fundamental transaction types from LPP: capability transfer, assistance data transfer, and location information transfer.

Proposal 11: The LMF should be a protocol endpoint for SLPP.

[R2-2210167](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210167%20Considerations%20on%20Sidelink%20positioning.doc) Considerations on Sidelink positioning CMCC discussion Rel-18 FS\_NR\_pos\_enh2

[Coverage scenarios]

Proposal 1: LMF is involved for SL positioning with network coverage (i.e., in-coverage or partial coverage).

Proposal 2: In the partial coverage scenario, the out-of-coverage UE could be the target UE or the anchor UE.

[Server UE]

Proposal 3: Location server UE could be employed to allocation the resource for target UE and anchor UE and perform the location estimating.

[Cast type]

Proposal 4: Broadcast/groupcast can be employed for SL capability exchange between UEs.

[Signalling for SL-PRS configuration]

Proposal 5: For the signalling design, RAN2 is kindly asked to consider the 2 options below to perform SL-PRS configuration for sidelink positioning:

- Option 1: high-layer signalling from an LMF, a gNB, or a UE with explicit configuration;

- Option 2: high-layer signalling for pre-config with lower layer indication related to SL-PRS (de)activation or resource indication/reservation.

Discussion:

vivo think this is RAN1 scope and they are already discussing the activation signalling.

CATT and Lenovo agree it is in RAN1 scope. Huawei also agree and think RAN1 already have these options.

Proposal 6: RAN2 is kindly asked to support different granularity of the pre-configuration, e.g., SL-PRS resource pool, SL-PRS, SL PRS set.

[R2-2209400](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209400%20Discussion%20on%20SL%20positioning.docx) Discussion on SL Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209425](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209425%20Discussion%20on%20sidelink%20positioning_final.docx) Discussion on sidelink positioning Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209536](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209536.docx) SL-PRS configuration MediaTek Inc. discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209560](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209560%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209606](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209606.docx) Support of sidelink positioning Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209671](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209671.docx) Protocol aspects of sidelink positioning Nokia Germany discussion Rel-18

[R2-2209693](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209693%20(R18%20NR%20POS%20SI%20A822_SLPos).doc) Discussion on Sidelink Positioning InterDigital, Inc. discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209729](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209729%20Further%20discussion%20on%20sidelink%20positioning.docx) Further discussion on sidelink positioning OPPO discussion Rel-17 FS\_NR\_pos\_enh2

[R2-2209767](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209767-SL-positioning-v0.docx) Sidelink Positioning Architecture and Protocol Stack Apple discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209979](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209979%20Discussion%20on%20potential%20solutions%20for%20SL%20positioning.docx) Discussion on potential solutions for SL positioning Spreadtrum Communications discussion Rel-18

[R2-2210003](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210003_SLPos_Solutions.docx) On SL Positioning Protocol and Architecture Aspects Lenovo discussion Rel-18

[R2-2210042](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210042%20Discussion%20on%20SL%20positioning.doc) Discussion on SL positioning Xiaomi discussion Rel-18

[R2-2210085](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210085%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning ZTE, Sanechips discussion Rel-18 NR\_pos\_enh-Core

[R2-2210115](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210115%20Discussion%20on%20Sidelink%20Positioning.docx) Discussion on Sidelink Positioning LG Electronics Deutschland discussion

[R2-2210210](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210210.docx) Considerations on sidelink positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210316](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210316%20SL.docx) SL positioning Terminology and Protocol Aspects Ericsson discussion Rel-18

[R2-2210481](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210481%20Discussion%20on%20SL%20positioning.docx) Discussion on SL positioning Samsung discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210546](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210546%20Discussion%20on%20OOC%20SL%20.docx) Discussion on out-of-coverage sidelink positioning Samsung R&D Institute UK discussion

### 8.2.3 RAT-dependent integrity

Study methodologies, procedures, signalling, etc for determination of positioning integrity for both UE-based and UE-assisted positioning. Focus on reuse of concepts and principles being developed for RAT-Independent GNSS positioning integrity, where possible. Identification of error sources may require input from RAN1.

Summary document

[R2-2210892](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210892%20Summary%20of%20AI%208.2.3%20on%20RAT-dependent%20integrity%20(Samsung).docx) [Pre119bis-e][405] Summary of AI 8.2.3 on RAT-dependent integrity (Samsung) Samsung R&D Institute UK discussion

[DNU flag]

Proposal 1-1. RAN2 discuss and conclude that DNU flag is to be reused for assistance information in RAT-dependent positioning integrity.

Proposal 1-2. RAN2 study the usage of DNU flag for the RAT-dependent positioning integrity.

Discussion:

ZTE think the DNU flag is useful; the UE is not required to provide all the TRPs’ measurements, and a DNU flag can reduce the complexity. They understand that RAN1 have seen related simulations.

Qualcomm understand that the DNU flags are inherent in the integrity principle of operation, so they share ZTE’s view that the network needs them to inform the UE if a feared event happens, and they do not see how we can exclude.

Huawei think for the measurement aspect, the DNU flags might be needed, but for assistance data they think it is not needed; in the legacy GNSS operation, what the network does is just forward assistance data, but RAT-dependent is different. They understand that a non-usable TRP could just be excluded from the AD, and they think the DNU flag is not actually used in the integrity equations.

Apple agree with Huawei: DNU was introduced for something out of our control, which is not the case in RAT-dependent positioning.

CATT think DNU depends on whether the AD are one-shot, but if the AD are periodic or have a validity time, there may be a need for DNU. They think we may need to wait for an agreement from RAN1 on the error sources that affect the AD, but we can design the principle of how to use the DNU.

Intel agree with Huawei and Apple and have a different view from CATT: If AD are periodic, sending the DNU requires the network to send an update to the UE, and the network could equally well remove the offending TRP. They also understand that the DNU cannot be used in a posSIB in relation to a particular UE.

Lenovo support the proposals and do not see a reason to restrict the study now. They think it may be needed for measurement results. They see that the DNU flag is related to the error sources.

Ericsson think the DNU is more related to whether the data can be used for integrity; there may be AD that are usable for positioning but not integrity.

OPPO think the DNU has some overlap with flags like the LoS/NLoS indication and certain results can be excluded from integrity computation.

Huawei indicate that the RAN1 feature lead is currently proposing to leave this question to RAN2, so we may need to take decisions in this direction.

OPPO indicate that the equation has a probability condition on the DNU presence, we can conclude after studying whether to indicate the DNU presence in the equation.

Agreement:

Proposal 1-2. RAN2 study the usage of DNU flag for the RAT-dependent positioning integrity (assuming RAN1 agree to leave it to RAN2) and conclude on whether to indicate the DNU presence in the integrity principle equation.

[Integrity principle]

Proposal 2-1. RAN2 agree to reuse the integrity principle Equation 8.1.1a in 38.305 for the R18 RAT-dependent integrity case.

Proposal 2-2. RAN2 discuss on the definition of each parameters used in the agreed Equation of the integrity principle 8.1.1a in 38.305, and redefine them if necessary per positioning method.

Discussion:

Nokia and Intel understand we agreed P2-1 last meeting. In this context, Nokia think the DNU needs to be revisited; for GNSS it was used for the correction data, and here we need to think about how it applies to RAT-dependent techniques; are we providing correction information for RAT-dependent cases also?

Intel think it is clear that the parameters need to be reviewed for RAT-dependent, and they understand RAN1 are also discussing how to use this equation.

CATT think we need to send an LS to RAN1 to ask them to review the equation.

[Integrity parameters]

Proposal 3. RAN2 agree to reuse the mapping of integrity parameters with further updating the contents based on RAN1 input.

[Operating modes and supported methods]

Proposal 4. RAN2 discuss and conclude to study the both UE-based and LMF-based integrity for RAT-dependent cases.

Discussion:

Intel understand that RAN1 have already agreed this. Huawei have the same view as Intel.

Huawei think RAN2 need to work on the signalling aspects, e.g., how we transport the error source information.

Agreement:

Proposal 4. RAN2 will study the both UE-based and LMF-based integrity for RAT-dependent cases.

Proposal 5. RAN2 discuss and conclude to support mode 1 and/or mode 2 for integrity result reporting.

Proposal 6. RAN2 agree that UE-based DL-TDOA and UE-based DL-AoD only applicable to UE-based integrity mode, and remaining method i.e., UE-assisted DL-TDOA, UE-assisted DL-AoD, Multi-RTT, UL-TDOA, and UL-AoA are applicable to LMF-based integrity mode.

[Signalling]

Proposal 7. RAN2 agree that R17 UE-based integrity mode signaling can be used as baseline with the following aspects:

- UE sends capability info to LMF on integrity for UE-based mode using LPP capability transfer procedure

- LMF sends the assistance data for integrity calculation to UE for integrity of UE-based mode

- LMF sends integrity requirement e.g., TIR to UE in LPP provide assistance data message for integrity of UE-based mode

- UE sends integrity result to LMF using LPP location information Transfer message

Discussion:

Lenovo are fine to reuse the Rel-17 signalling as a baseline, but in Rel-17, the integrity requirement comes in Request Location Information, so the third bullet is wrong.

Huawei think for UE-based, the main specification impact is AD delivery and UE capability transfer. The rest of the signalling mentioned here can be reused from Rel-17, e.g., the delivery of the integrity result in Provide Location Information.

Agreement:

Proposal 7 (modified). RAN2 agree that R17 UE-based integrity mode signaling can be used as baseline with the following aspects:

- UE sends capability info to LMF on integrity for UE-based mode using LPP capability transfer procedure

- LMF sends the assistance data for integrity calculation to UE for integrity of UE-based mode

- LMF sends integrity requirement e.g., TIR to UE in LPP request location information message for integrity of UE-based mode

- UE sends integrity result to LMF using LPP location information Transfer message

[Assistance data contents]

Proposal 8-1. RAN2 agree LMF should, in assistance data, provide the information of error source originated from RAN node to UE for UE-based integrity mode.

Discussion:

CATT agree with the proposal in principle, but think it depends on RAN1. They are not sure that there are error sources originated from the RAN node.

Huawei understand that for UE-based integrity, RAN1 have agreed on TRP location and inter-TRP synchronisation as error sources coming from the RAN node. ZTE agree with Huawei.

Intel think the RAN node may not be the only error source and we could make the proposal more generic.

Qualcomm think integrity is integrity and we should talk about UE-based vs. UE-assisted positioning, not “UE-based integrity”. Lenovo point out we have used “UE-based integrity” elsewhere. Intel understand that in Rel-17 we only supported the integrity result being computed at the UE, and now we are looking at a situation where the positioning calculation function performs the integrity calculation as well.

Ericsson think there was some confusion with these terms in Rel-17; they think we may need to come back to it, since there seem to be different interpretations.

Agreement:

LMF provides, in assistance data, the information of error sources (e.g., originated from RAN node) to UE for integrity in UE-based mode.

Proposal 8-2. RAN2 discuss and agree on further items below about the carried contents and carrying field/msg aspects:

- The information of error source originated from RAN node could be TRP-location and/or inter-TRP synchronization

- Above information is carried with TRP info field in the NR-PositionCalculationAssitance IE in the LPP ProvideAssistanceData msg

- Above information could be mean and deviation of error source (i.e., TRP-location, inter-TRP synchronization)

- Above information could be error bounds for the error source (i.e., TRP-location, inter-TRP synchronization) and is associated with each TRP.

- Dedicated and broadcast signaling are used for the signaling

Discussion:

Intel and Nokia think these points can be addressed in WI phase when we have more information from RAN1. Ericsson agree.

Proposal 8-3. RAN 2 consider the NRPPa enhancement on introducing signaling between LMF and gNB/TRP on TRP related information error source for UE-based integrity mode.

[Reporting of error sources]

Proposal 9-1. RAN2 discuss and agree that UE provide its originated error source to RAN node, and the serving RAN node provides those error source information to LMF for UL positioning LMF-based integrity mode.

Proposal 9-2. RAN2 agree that UE provide the UE originated error source to LMF via LPP message for DL&UL positioning LMF-based integrity mode.

Discussion:

Huawei think for UL positioning, RAN1 have not defined such error sources so far.

InterDigital have a similar view to Huawei and wonder what the definition of “originated error source” from UE is.

Lenovo share the same view and think the UL case is more about the gNB reporting the error source.

Proposal 9-3. RAN2 agree that RAN node provides RAN node originated error source to LMF via NRPPa signaling in both UL and DL&UL positioning LMF-based integrity mode.

Proposal 9-4. RAN2 further discuss and agree the followings on the error source contents carried from serving RAN node to LMF via NRPPa for LMF-based integrity mode.

- Contents would be the error of RTOA measurement for UL-TDOA, and the error of AoA/ZoA for UL-AoA, error of gNB Rx-Tx time difference measurement for Multi-RTT

- RTOA meas, gNB Rx-Tx time difference meas. and AoA meas, the error bound for each error source should be associated with each Measurement Response msg or Measurement Report msg in NRPPa sepc.

- The error source contents is provided along with gNB measurement result.

Proposal 9-5. RAN2 agree that UE oriented error source to be sent from UE to LMF via LPP for DL&UL positioning LMF-based integrity mode would be the error of UE Rx-Tx time difference for Multi-RTT

Proposal 10. RAN2 define UE capability and its signalling required to send/receive error source model during WI phase.

* [AT119bis-e][429][POS] Rel-18 integrity text proposal (CATT)

Scope: Draft a text proposal on the RAN2 agreements on RAT-dependent integrity.

Intended outcome: Endorsable TP in R2-2210918

Deadline: Monday 2022-10-17 1700 UTC

The following documents will not be individually treated

[R2-2209403](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209403-Discussion%20on%20RAT%20dependent%20integrity.docx) Discussion on RAT dependent integrity CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209426](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209426%20Discussion%20on%20RAT-dependent%20integrity_final.docx) Discussion on RAT-dependent integrity Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209561](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209561%20discussion%20%20on%20RAT-dependent%20positioning%20integrity.docx) Discussion on RAT-dependent integrity vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209608](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209608%20_support%20of%20RAT%20dependent%20integrity.docx) Integrity for RAT dependent positioning methods Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209694](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209694%20(R18%20NR%20POS%20SI%20A823_Integrity).doc) Discussion on RAT-dependent Integrity InterDigital, Inc. discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209725](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209725%20Consideration%20on%20RAT-dependent%20integrity.docx) Consideration on RAT-dependent integrity OPPO discussion Rel-17 FS\_NR\_pos\_enh2

[R2-2209961](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209961%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent positioning integrity Lenovo discussion Rel-18

[R2-2209980](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209980%20Discussion%20on%20solutions%20for%20integrity%20of%20RAT-dependent%20positioning%20techniques-v1.0.docx) Discussion on solutions for integrity of RAT-dependent positioning techniques Spreadtrum Communications discussion Rel-18

[R2-2210084](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210084%20Discussion%20on%20RAT-dependent%20methods%20positioning%20integrity.docx) Discussion on RAT-dependent methods positioning integrity ZTE, Sanechips discussion Rel-18 NR\_pos\_enh-Core

[R2-2210116](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210116%20Discussion%20on%20RAT-dependent%20positioning%20integrity.doc) Discussion on RAT-dependent positioning integrity Xiaomi discussion

[R2-2210140](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210140.docx) Discussion on RAT-dependent integrity CMCC discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210211](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210211.docx) Considerations on solution for integrity of RAT dependent positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210317](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210317%20Integrity.docx) RAT-dependent integrity and TP for TR Ericsson discussion Rel-18

[R2-2210364](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210364_(integrity).docx) Integrity of NR Positioning Technologies Qualcomm Incorporated discussion

[R2-2210547](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210547%20Discussion%20on%20integrity%20of%20RAT%20dependent%20positioning%20techniques%20.docx) Discussion on integrity of RAT dependent positioning techniques Samsung R&D Institute UK discussion

### 8.2.4 LPHAP

Study the requirements on LPHAP as developed by SA1 and evaluate whether existing RAN functionality can support these power consumption and positioning requirements. Based on the evaluation, and, if found beneficial, study potential enhancements to help address any limitations.

Email discussion summary

[R2-2209405](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209405%20Report%20of%20%5bPost119-e%5d%5b407%5d%5bPOS%5d%20LPHAP%20upper%20layer%20enhancements%20(CATT).docx) Report of [Post119-e][407][POS] LPHAP upper layer enhancements (CATT) CATT discussion Rel-18 FS\_NR\_pos\_enh2

Proposal 1: RAN2 to further study optimization on paging and/or RRM measurements for the 6 - 12 months battery life requirement of LPHAP including:

1. Discuss if there is requirement of positioning-only UEs in LPHAP.

2. Discuss the candidate solutions based on the requirement:

- a) Relax paging and/or RRM measurement through simple negotiation between UE and network. (4/14)

- b) Define a new mode for LPHAP with reference to the MICO mode which is used for CM\_IDLE UE at present. (3/14)

- c) Extended DRX or reduce/configure the SSB to match the PRS instance. (1/14)

Discussion:

Nokia want to understand if there are special LPHAP devices, not necessarily positioning-only, but distinguished devices that the system can handle differently.

CATT think we should look at the customer requirements. They understand that a positioning-only UE might be a workpiece in a factory use case, for example, which would never have a regular service request (e.g. no emergency calls). They think only deferred MT-LR needs to be supported for these UEs, and they are not exactly special devices in terms of UE type.

Huawei think on the paging/RRM discussion generally, these cases do not motivate a new UE type; we already have MICO mode which avoids paging and RRM but does not define a new UE type. They also agree with Nokia that we need to think about how to optimise paging and RRM based on the LPHAP requirements; without such optimisations they do not think the 6-12 months battery life requirement can be met.

Lenovo acknowledge the scenario of positioning-only UEs, but they think LPHAP cases can also apply to non-positioning-only UEs, and the network should be aware which type it faces.

Qualcomm think a new UE type is out of scope; they agree with Nokia that it may be more about use cases than devices. They do not think an NR-compliant device can avoid support of other requirements and procedures. It would need to be a RAN plenary or SA2 decision to introduce a new device type.

Ericsson have a similar view to Qualcomm; if a device is connected through cellular, it must support the requirements for cellular communication. They see that there could be negotiation for IIoT scenarios to disable certain features, but they agree this is not a new device type.

CMCC indicate that industrial customers have a requirement for UEs that only request high-accuracy location. They understand that this is a case of UEs operating in a positioning-only mode, not a new device type.

Apple think the described candidate solutions are not very related to positioning and may be out of our scope.

Xiaomi think the solutions are more related to general power saving and we should focus on positioning enhancements.

OPPO think we would consult with SA about positioning-only devices, but they see it as out of RAN2 scope. On MICO or other power saving enhancements, they think it is better to discuss in other WIs; they see that MICO involves CN signalling.

Intel have the same view as other companies that we should focus on enhancements related to positioning. For bullets a and b above, since they are not positioning-related, Intel think we should not discuss them, and bullet c seems more in RAN1 scope. ZTE agree with Intel but think option c can be discussed with P4 below if necessary.

Samsung also do not support study on paging/RRM and want to focus on positioning, but they think it is worth clarifying if there is a requirement for positioning-only UEs; they would like to ask SA.

Huawei understand from the SA1 requirements that the power saving is not only positioning power consumption: SA1 refer to “a combination of energy for positioning and energy for communication and synchronisation”. So they understand that we need to consider total power consumption, and if we do not look at background power consumption here, which will constitute the majority of the power consumption over a long battery lifetime, the goal is unachievable.

CMCC share Huawei’s view. Regarding the battery life requirement, they think the gap is quite huge and significant enhancements are required; paging and RRM enhancements can save a lot of power consumption. They think these could be useful for positioning-only cases when other functions can be suspended while there is no other service.

CATT think at least during deferred MT-LR, we may look into relaxed paging and RRM.

vivo wonder if MICO will introduce extra issues; if the UE skips RRM, is mobility not supported, and does UL positioning work without RRM measurements? They want to clarify that the existing functionality should not be impacted.

Ericsson think we agreed last meeting that if RAN1 say the SA1 requirement is not met, we would do some kind of enhancements, but they wonder if we are the right group to do general power enhancement; it might be better in the power saving WI. However, they think some analysis beyond positioning expertise might be needed.

Sony think we have power saving enhancements from Rel-17, and in this WI we should focus on positioning functionality and discuss how we can do it in a power-efficient manner.

Lenovo think we should focus on the enhancements related to positioning procedures, and general power saving enhancements are out of scope.

Intel indicate that if we introduce MICO, it will impact the CN; paging will impact the CN; and RRM relaxation needs to be evaluated in RAN4. So they think if we introduce general power saving functionality we may not be able to finish the work.

Huawei think we should agree not to introduce a new device type “for positioning only for paging and RRM”. Chair thinks we could safely agree in general not to create a new device type. Intel have the same view as the chair and think the device type discussion was general.

Agreement:

RAN2 do not introduce a new device type for positioning only.

Proposal 2: RAN2 agree that support of MT-SDT in Rel-18 positioning is treated as low priority in SI. (14/15)

Agreement:

Proposal 2: RAN2 agree that support of MT-SDT in Rel-18 positioning is treated as low priority in SI. (14/15)

Proposal 3: RAN2 agree to study enhancements on SRS configuration (12/15). Further study the following candidate enhancements on SRS configuration, including the possible interference and changes of spatial relations problems.

- a) Validity area mechanism; (12/13)

- b) SRS update mechanism; (10/13)

- c) Pre-configure multiple SRS; (9/13)

Discussion:

Xiaomi think for option c, it was described in the email discussion that the SRS can be preconfigured by SI; they are not sure how this works since SRS are UE-specific.

Huawei indicate that having a broadcast configuration in SI does not mean it is not UE-specific. The configuration is broadcasted to multiple UEs, but when the UE actually does positioning, it needs to interact with the network to ask permission, and this procedure would be UE-specific. Huawei and Qualcomm think item c does not imply broadcast.

Samsung think there could be interference issues with a and c, and this should be evaluated in RAN1, but they are open to discuss item b and how to update the SRS without entering RRC\_CONNECTED.

CATT agree we should further study, and on item c, they want to clarify that the network can preconfigure the multiple SRS to the UE and the UE can negotiate with the network, for instance with an index of one of the multiple configurations.

Intel are open for further discussion of these options, but they want to point out that if the UE has multiple configurations along with a validity area, the measuring node may need to monitor all of them unless we introduce some kind of synchronisation mechanism.

Ericsson think we should capture the potential for interference problems and TA alignment issues, both of which might need to be looked at by RAN1. They also see that there could be some network complexity and a requirement to overprovision the measuring nodes. They wonder if RAN3 should also look into this area.

Huawei think we should ask RAN1 about the PHY issues: We could define the validity area and ask RAN1 to consider if there are potential issues. Ericsson think we should Cc: RAN3.

ZTE agree to send the LS.

Apple think we could ask about which SRS parameters are valid across multiple cells.

Intel think there is not time in the SI to get a useful response from RAN1, even if RAN1 luckily have consensus as soon as they receive the LS. Ericsson think we can try.

Huawei think from RAN2 perspective, the benefit of these enhancements is obvious, and we can ask RAN1 if it is feasible from their perspective; as the leading group on the LPHAP objective, we should not wait for RAN1.

Agreement:

Proposal 3 (modified): RAN2 agree to study enhancements on SRS configuration (12/15). Further study the following candidate enhancements on SRS configuration, including the possible interference and changes of spatial relations problems.

- a) Validity area mechanism; (12/13)

- b) SRS update mechanism; (10/13)

- c) Pre-configure multiple SRS, which could include broadcast transmission of configurations with UE-specific determination along with the network of a configuration; (9/13)

FFS if item c would require network nodes to measure multiple SRS configurations for the same UE simultaneously.

LS to RAN1 to ask them about interference issues with SRS configurations across multiple cells and about the validity of SRS parameters.

* [AT119bis-e][428][POS] LS to RAN1 on SRS in multiple cells (Huawei)

Scope: Draft an LS to RAN1 to ask them about interference issues with SRS configurations across multiple cells and about the validity of SRS parameters.

Intended outcome: Approved LS (without CB if possible) in R2-2210917

Deadline: Monday 2022-10-17 1700 UTC

Proposal 4: RAN2 will study the candidate enhancements on DL-PRS configuration after there is progress in RAN1.

- a) Simplified PRS configuration; (2/15)

- b) PRS is configured close to SSBs; (2/15)

- c) Limit PRS reception in a time period; (3/15)

- d) Configuration alignment between PRS and DRX; (9/15)

Discussion:

ZTE think a and b are under discussion in RAN1, and c in RAN4, so they suggest adding RAN4 to the agreement.

Lenovo think items a/b/c can be discussed in RAN1, but item d can be discussed in RAN2. On item d, they want to clarify if it means C-DRX or paging DRX or both; they think both should be included.

vivo think the current status in RAN1 is that they are wondering if these enhancements should be discussed in RAN2 first, so there seems to be a deadlock.

Ericsson understand that since this is for low-power cases, the DRX would be more about idle/inactive than C-DRX.

OPPO think regarding bullet d, RAN4 view is that the UE will not monitor PRS in the DRX off-period, so d may not make sense, because even if the PRS is denser than the DRX on-durations, the UE does not gain. They think maybe we should consult RAN4 about item d.

CATT indicate that companies agreed during the discussion to study d, but a/b/c are RAN1 topics where RAN2 cannot make any decision. They think RAN2 can discuss the signalling alignment in d. InterDigital and Ericsson agree.

OPPO think we should confirm the usefulness of item d before discussing signalling.

Intel recall that we agreed last meeting to discuss the feasibility of solutions and leave it to RAN1 to evaluate if there is a gain, so they think RAN2 should not try to judge if there is a benefit, only if it is feasible.

InterDigital have the same understanding as Intel and CATT that item d should be discussed in RAN2. They understand from the RAN4 information mentioned by OPPO that the benefit of alignment is obvious, because the UE measures in alignment with the DRX on-duration.

Sony wonder for c and d if RAN4 are really going to progress in the SI phase.

OPPO want to clarify their comment: If the configuration of the PRS is denser in time domain than the DRX on-periods, then the UE only needs to monitor PRS in the DRX on state, so the configuration of the PRS as such does not affect the UE. We only need to care if DL-PRS is available in the DRX on-periods.

Agreement:

RAN2 will study the following candidate enhancements on DL-PRS configuration after there is progress in RAN1 and potentially RAN4.

- a) Simplified PRS configuration; (2/15)

- b) PRS is configured close to SSBs; (2/15)

- c) Limit PRS reception in a time period; (3/15)

RAN2 can consider the feasibility of configuration alignment between PRS and DRX (at least paging DRX).

Proposal 5: RAN2 agree to study enhancements on event report (10/14). Further discuss the use case and the associated conditions when the legacy event report can be omitted/skipped in UL/DL positioning procedure, e.g. the positioning event is periodic and time determined event in deferred MT-LR, and send an LS to SA2 if there is progress.

Discussion:

Intel think since the event report is defined in SA2, we should leave it to them. Samsung agree.

CATT agree the event report is related to SA2, but they think RAN2 can look at how to skip it in the DL and UL positioning procedures and leave SA2 to further check.

Samsung tend to agree with the motivation, but they think it is an SA2 issue.

Huawei agree with CATT that this can be studied in RAN2 from the perspective of whether the event report is necessary for UL positioning, followed by an LS to SA2.

Xiaomi also agree with CATT and Huawei and think we can discuss in RAN2 and ask SA2 to confirm; they think the event report can be skipped especially for the area-specific SRS configuration.

Ericsson, Lenovo, and ZTE think it is in SA2 scope.

Proposal 6: RAN2 to agree exposure information from UE to gNB and/or LMF, e.g. indication for LPHAP scenario (10/14). Further discuss if the solution e.g. capability as the indication should be discussed in SI or WI.

Discussion:

Huawei think this information is under discussion in SA2. E.g., they are considering getting information from the UDM. If it is about radio capability, it can be looked at in the WI phase in RAN2.

Intel think there are two aspects: One possibility is as mentioned by Huawei, but the other is to introduce a solution in RAN such as an LPHAP capability. From RAN2 perspective, we should not discuss the first one, and the second would be OK to discuss in WI phase.

vivo agree with Huawei and think we could expose information to gNB and/or LMF without saying that it is necessarily from the UE (e.g., it may come from the AMF).

ZTE agree with Huawei and Intel, and for the RAN aspects, they wonder if we would have one capability for LPHAP scenarios or different capabilities for different features.

Qualcomm think this seems to be a capability exchange, in which case we could handle it as normal in the WI phase.

Nokia agree with Huawei and Intel, but they think “information” is a bit too vague and we may need to clarify what exposure of a scenario means.

CATT think it is necessary for the gNB or LMF to know if the UE is in an LPHAP use case, and this is what needs to be indicated. To ZTE’s comment, they think that there may be candidate solutions in SA2, but there is no conclusion there yet. They think RAN2 can conclude that we need this information.

Nokia are not sure what can be indicated in terms of a use case, and they do not want to convey anything to SA2 until we have a conclusion.

Lenovo think we can confirm that the information is necessary and leave the details to WI.

Intel think we did not agree to any enhancement, which is why the proposal is not completely clear as observed by Nokia. They suggest we add the condition “if any enhancement for LPHAP is agreed”.

Nokia think we have other agreements saying “can be studied” and this agreement should be in the same category.

Agreement:

Exposure of LPHAP information to the gNB and/or LMF (e.g., as a UE capability) can be discussed in normative work if any enhancement for LPHAP is agreed, taking into account any guidance from SA2.

Proposal 7: RAN2 agree to study DL positioning in RRC\_IDLE (13/15) including:

1. Agree to provide AD for DL positioning in RRC\_IDLE as in legacy using: via a broadcast signaling or pre-configuration.

2. Further discuss the two candidate solutions on how to report measurements as below:

Alt1: measurement is performed in IDLE and reported in CONNECTED, including the concerns:

- Whether the mechanism of measurement in IDLE and report in CONNECTED is more beneficial for power saving than legacy mechanism, i.e. RRC\_INACTIVE positioning.

- Whether the CN can handle the measurement reports from the UE in RRC\_CONNECTED, while the positioning was performed in RRC\_IDLE for MO-LR, MT-LR and NI-LR.

Alt2: measurement is performed in IDLE and report is carried with initial access messages, including the concern:

- Is there AS context/security issue on sending the measurements to LMF?

Discussion:

Intel are fine with the proposal but want to point out that bullet 1 was already agreed in Rel-17.

Xiaomi support the proposal, but for Alt2 they think the use of Msg5 can be considered to address the security issue; for the AS context issue they think SA2 should be involved.

Ericsson generally support the proposal. They think the RAN1 definition of RSTD for idle mode is missing, and maybe we should capture something to reflect that.

Huawei think the most important issue in DL positioning in RRC\_IDLE is that the event cannot send the measurement report; it has to transition to another state, and then the question is whether there is power saving benefit. They are not sure MO-LR is needed for the workpiece use case.

OPPO have some concern on bullet 1 of the original proposal wrt using preconfiguration. This would mean the UE receives the AD in connected mode and continues to use it in RRC\_IDLE; in such a case the UE context would not be stored, so it is not clear how the UE can use the preconfigured AD.

Intel think OPPO’s question is good; they think it can be handled by implementation in the UE to continue the PRS measurement in idle. vivo points out that AD are stored in the LPP layer.

Ericsson agree with Intel and vivo and think this is already supported in LTE for NB-IoT.

Qualcomm also support the proposal (both Alt1 and Alt2), but they think Alt1 has no RAN2 impact. For Alt2, they think it may be a bit outside positioning as such; sending something in idle mode to the network may impact other sessions. Ericsson agree with Qualcomm.

Agreement:

Further discuss the two candidate solutions on how to report measurements taken in RRC\_IDLE as below:

Alt1: measurement is performed in IDLE and reported in CONNECTED, including the concerns:

- Whether the mechanism of measurement in IDLE and report in CONNECTED is more beneficial for power saving than legacy mechanism, i.e. RRC\_INACTIVE positioning.

- Whether the CN can handle the measurement reports from the UE in RRC\_CONNECTED, while the positioning was performed in RRC\_IDLE.

Alt2: measurement is performed in IDLE and report is carried with initial access messages, including the concern:

- Is there AS context/security issue on sending the measurements to LMF?

Proposal 8: RAN2 to further discuss whether to study UL positioning in RRC\_IDLE (5/14) including the following issues:

- The beneficial for power saving of support UL positioning in RRC\_IDLE state;

- Whether UE can send SRS in RRC\_IDLE state, considering capability and/or AS security problem;

- The accuracy of PRACH based positioning;

Other documents

[R2-2209401](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209401%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209424](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209424%20Discussion%20on%20the%20LPHAP_final.docx) Discussion on the LPHAP Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209562](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209562%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209609](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209609%20_support%20of%20LPHAP.docx) Support of LPHAP Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209695](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209695%20(R18%20NR%20POS%20SI%20A824_LPHAP).doc) Discussion on LPHAP InterDigital, Inc. discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209727](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209727%20Further%20consideration%20on%20LPHAP.docx) Further consideration on LPHAP OPPO discussion Rel-17 FS\_NR\_pos\_enh2

[R2-2209768](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209768-LPHAP-v0.docx) Potential LPHAP enhancements Apple discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209962](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209962%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2210083](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210083%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP ZTE, Sanechips discussion Rel-18 NR\_pos\_enh-Core

[R2-2210117](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210117%20Discussion%20on%20LPHA%20Positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2210168](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210168 Considerations on LPHAP.doc) Considerations on LPHAP CMCC discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210212](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210212.docx) Considerations on on solution for Low Power High Accuracy Positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210318](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210318%20LPHAP.docx) LPHAP and Text Proposal for TR Ericsson discussion Rel-18

[R2-2210365](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210365_(LPHAP).docx) Enhancements to Positioning in RRC\_INACTIVE State for LPHAP Qualcomm Incorporated discussion

[R2-2210482](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210482%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Samsung discussion Rel-18 FS\_NR\_pos\_enh2

### 8.2.5 RedCap positioning

Based on RAN1 evaluation, assess the necessity of enhancements, and, if needed, identify enhancements to help address limitations associated with RedCap UEs.

Following two documents discussed jointly

[R2-2209963](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209963%20Discussion%20on%20RedCap%20Positioning.doc) Discussion on RedCap positioning Lenovo discussion Rel-18

Proposal 1: RAN2 is suggested to study RedCap UE identification for LMF and associated procedures.

Proposal 2: RAN2 is suggested to consider signaling design on the assistance information transfer to support frequency hopping identified by RAN1.

Proposal 3: For the enhancements aside from frequency hopping in UE complexity reduction, RAN2 is suggested to wait for more progress on RAN1.

Proposal 4: For power saving enhancements of RedCap Positioning, if necessary, RAN2 is suggested to take the solutions defined in LPHAP into consideration.

[R2-2209563](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209563%20Discussion%20on%20RedCap%20positioning.docx) Discussion on RedCap positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

Proposal 1: Wait for RAN1’s evaluation conclusion of frequency hopping for RedCap positioning before RAN2 starts the higher layer aspects design.

Proposal 2: RAN2 to study the mechanism to optimize the power consumption of RedCap positioning in RRC\_CONNECTED, e.g., introducing an indication from LMF for PRS measurement within the drx-onDurationTimer or DRX active time.

[RedCap UE identification to LMF]

Discussion:

Nokia wonder what the LMF behaviour for this information would be.

Huawei think more discussion is needed for why the LMF needs to know; if frequency hopping is used, the gNB already knows that it is a RedCap UE and can handle the configuration.

Lenovo think the LMF can provide configurations in AD that comply with the bandwidth restriction of the RedCap UE, and the details for how to identify the UE can be left FFS.

CATT support the motivation; they understand that the LMF needs to know when the target is a RedCap UE for bandwidth-restricted configurations. They think there are two candidate solutions for how to indicate: either UE capability in LPP or request from the AMF for RedCap positioning.

Qualcomm think for frequency hopping, it is a normal capability and we do not need any special enhancement, but there may be other enhancements for which the AMF would send a flag to the LMF. They think this is more of a WI-phase discussion.

Intel and vivo want to remove the term “identification”; they think we might indicate only some information such as a configuration restriction. Huawei agree.

Ericsson have some concern that we should look at how RedCap UEs provide this sort of information to the gNB today.

Agreement:

Information on RedCap UE capability from the UE to the LMF (e.g., restricted bandwidth capability) can be discussed in WI phase.

[Enhancements for frequency hopping]

Discussion:

Nokia think we need to wait for RAN1; for RAN2 impact we will need to identify specific parameters needed for assistance data, which can wait until RAN1 endorse a solution.

Intel agree with Nokia.

Qualcomm have a similar view and do not see anything that RAN2 need to study; this looks like implementation of the RAN1 parameter list.

Samsung agree.

Lenovo think RAN1 have confirmed the intention for frequency hopping, so signalling impact can be anticipated, but they are OK to wait for the conclusions.

Agreement:

RAN2 wait for RAN1 conclusion on the signalling design for assistance data for frequency hopping.

[Other enhancements]

[R2-2209404](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209404-Discussion%20on%20RedCap%20Positioning.docx) Discussion on RedCap Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209643](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209643%20Discussion%20on%20REDCAP%20Positioning.docx) Discussion on RedCap Positioning Huawei, HiSilicon discussion

[R2-2209696](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209696%20(R18%20NR%20POS%20SI%20A825_RedCap).docx) Discussion on Redcap Positioning InterDigital, Inc. discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2209756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209756%20_RedCap%20positioning.docx) RedCap positioning Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2210082](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210082%20Discussion%20on%20RedCap%20positioning.docx) Discussion on RedCap positioning ZTE, Sanechips discussion Rel-18 NR\_pos\_enh-Core

[R2-2210118](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210118%20Discussion%20on%20RedCap%20UE%20Positioning.doc) Discussion on RedCap UE positioning Xiaomi discussion

[R2-2210319](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210319%20RedCap.docx) Positioning for RedCap UEs Ericsson discussion Rel-18

## 8.9 Enhanced NR Sidelink Relay

(NR\_SL\_relay\_enh-Core; leading WG: RAN2; REL-18; WID: RP-221262)

Time budget: 1.5 TU

Tdoc Limitation: 4 tdocs

### 8.9.1 Organizational

Including incoming LSs and rapporteur inputs.

[R2-2209357](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209357_S2-2207518.docx) LS on ProSe Authorization information related to UE-to-UE Relay operation to NG-RAN (S2-2207518; contact: LGE) SA2 LS in Rel-18 FS\_5G\_ProSe\_Ph2, NR\_SL\_relay\_enh To:RAN2, RAN3

* [AT119bis-e][415][Relay] LS from SA2 on authorization for UE-to-UE relay (LG)

Scope: Discuss the LS in R2-2209357 and attempt to converge on a reply.

Intended outcome: Approvable LS in R2-2210903

Deadline: Friday 2022-10-14 1000 UTC

### 8.9.2 UE-to-UE relay

Single-hop Layer-2 and Layer-3 UE-to-UE relay for unicast. Focus for this meeting is on the common L2/L3 parts: relay discovery and (re)selection. Tdocs on other aspects of the objective may be submitted but will not be treated at this meeting.

Summary document

[R2-2210893](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\draft_R2-2210893%20-%20summary%20of%208_9_2_U2U_Relay_v1.docx) Summary of AI 8.9.2 – UE to UE Relay (InterDigital) InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[Easy Proposals]

Proposal 1.1: In UE-to-UE relay, the remote/relay UE can acquire discovery configuration as in Rel17. FFS if any restrictions specific to UE-to-UE relay are introduced for in-coverage UE to minimize gNB control/involvement.

Proposal 2.1: Protocol stack for U2N Relay discovery is re-used for U2U Relay Discovery

Proposal 2.2: U2U Relay re-uses SL-SRB4 (with associated PDCP, RLC procedures and configuration) to carry discovery messages

Proposal 4.1: Both shared and dedicated resource pool can be used for U2U discovery transmission and Rel-17 pool selection principle is re-used.

Proposal 5.1: SL-RSRP and SD-RSRP can be used for relay selection/reselection criteria. RAN2 discusses when each of the two quantities are used and whether to re-use the criteria in Rel17.

Proposal 7.1a: Relay selection triggers include at least 1) Upper layer trigger; 2) PC5 signal strength conditions. RAN2 further discuss details for trigger 2).

Proposal 7.1b: Relay reselection triggers include at least 1) Upper layer trigger; 2) PC5-RLF detection at the remote UE; 3) PC5-RLF indication received from the relay; 4) PC5 signal strength conditions. RAN2 further discuss details for trigger 4).

Discussion:

OPPO think on P1.1, it is OK to have a simplification to use preconfiguration for OOC and dedicated configuration for IC. On P7.1b, they understand that there should also be a condition for PC5 release message from relay to remote; they are not sure why this has been omitted.

LG consider that P1.1 just describes the method of acquiring the configuration; they think it could be modified to preconfiguration/dedicated only. On P7.1b, they agree with OPPO, and on P7.1a, they think condition 2 depends on condition 1 as well. On P7.1b, they think cases 3 and 4 should just be informed to upper layer.

Qualcomm understand on P1.1 that gNB control from U2N could be reused for U2U, for example, for resource allocation when the UE is in coverage; so they want to remove the condition “to minimize gNB control/involvement”, but they agree that we can reuse the existing behaviour.

Ericsson also have a concern about P1.1: They think gNB involvement with U2U does not make sense as it did with U2N, and they think only the cell-specific configuration is useful when IC and there is not a need for dedicated configuration since the traffic does not flow through the gNB. They think we might be able to agree on “simplified gNB involvement” as a general guideline.

Intel wonder about adding an FFS on P5.1 for clarity, and on 7.1b, they think condition 2 could be considered as an upper layer trigger, in which RLF is indicated to upper layers and the upper layers cause the actual reselection.

ZTE have a concern with P1.1: It is not clear what kind of restrictions are considered. We may not need to support similar restriction to U2N, but the network should be able to control SL communication.

InterDigital clarify that the restrictions in P1.1 were intended to be specific to the UE in RRC\_CONNECTED.

Samsung are concerned about the restrictions in P1.1; they wonder why we should handle U2U discovery differently from U2N.

vivo think in P7.1a and P7.1b, there are some conditions where we should explicitly state which UE considers them. Chair understands they are all for the remote UE; InterDigital confirm this is the intention.

Ericsson wonder if we could add “cell-specific” to the idle/inactive case in P1.1.

Xiaomi have a concern about the scope of the FFS in P7.1b. They would like T400 expiry to be explicitly included in the scope of the FFS. Qualcomm think this was not previously discussed and should be left FFS.

Agreements:

Proposal 1.1 (modified): In UE-to-UE relay, the remote/relay UE in RRC\_IDLE/RRC\_INACTIVE or OOC can acquire discovery configuration as in Rel17 (i.e., cell-specific configuration/preconfiguration). FFS if any restrictions specific to UE-to-UE relay are introduced for in-coverage UE in RRC\_CONNECTED.

Proposal 2.1: Protocol stack for U2N Relay discovery is re-used for U2U Relay Discovery

Proposal 2.2: U2U Relay re-uses SL-SRB4 (with associated PDCP, RLC procedures and configuration) to carry discovery messages

Proposal 4.1: Both shared and dedicated resource pool can be used for U2U discovery transmission and Rel-17 pool selection principle is re-used.

Proposal 5.1: SL-RSRP and SD-RSRP can be used for relay selection/reselection criteria. FFS when each of the two quantities are used and whether to re-use the criteria in Rel17.

Proposal 7.1a: Relay selection triggers include at least 1) Upper layer trigger; 2) PC5 signal strength conditions. RAN2 further discuss details for trigger 2).

Proposal 7.1b (modified): Relay reselection triggers include at least 1) Upper layer trigger; 2) PC5-RLF detection at the remote UE; 3) PC5-RLF indication received from the relay; 4) PC5 signal strength conditions; 5) PC5 link release message from relay to remote. RAN2 further discuss details for trigger 4), potentially including T400 expiry. FFS if some of the conditions could be indicated to upper layer instead of directly causing reselection.

[Proposals for further discussion]

Proposal 3.1: RAN2 discusses whether Rel17 SI assumptions on RRC state and coverage scenarios can be re-used, and if so, whether some simplified gNB control is needed for the in coverage scenario.

Discussion:

Ericsson are fine to reuse the assumptions, but think in general we could agree to simplify the gNB involvement in U2U.

Qualcomm are not sure what Ericsson’s proposal means. Ericsson clarify the point is that we cannot just copy the U2N behaviour; e.g., they think we should not have measurement reporting to the gNB for path switch in U2U. Huawei have the same question as Qualcomm.

Apple think on the Ericsson proposal, we should restrict attention to “U2U-relay-specific operation”.

LG do not understand why we should have a restriction to simplify the gNB involvement in P3.1; in particular, they think mode 1 may be more applicable in U2U than in U2N.

Huawei think Ericsson’s proposal is a bit too generic and we should not restrict now. They think the original P3.1 is fine.

Intel have some sympathy for Ericsson’s proposal; the WID for U2U says we do not support service continuity, so it is natural that we would not have much gNB involvement in path switching.

InterDigital suggest U2U and U2N procedures will be specified separately from gNB perspective. OPPO think this could conflict with some other proposals such as P4.2. InterDigital think P4.2 is not necessarily an overlapped procedure; from the gNB perspective there is a configuration of a resource pool, which could be the same or different, but the specification details do not necessarily assume any overlap in the procedures. Samsung have a similar understanding.

Kyocera think simplification of the gNB covers many aspects and proposals and we may need further discussion first.

LG want to clarify about the U2N and U2U procedures; they find the current statement unclear, since, for instance, an RRCReconfiguration may need to contain both U2U and U2N configurations and we would not want to force ourselves to split the message. But the principle that U2U operation can be decoupled from U2N operation seems reasonable.

Ericsson think the gNB control in P3.1 should still be “simplified”. LG clarify that it seems right that U2U operation should be supported with less gNB involvement than the U2N case, but it is not completely clear how the principle will work.

Agreements:

RAN2 will strive to simplify the gNB involvement in U2U-relay-specific operation as compared to the U2N case. Details are FFS, including whether some gNB control is needed for the in-coverage scenario and how/whether the gNB involvement can be simplified compared to U2N.

Rel17 SI assumptions on RRC state and coverage scenarios can be re-used.

Proposal 4.2: RAN2 discuss whether the dedicated discovery resource pool introduced in Rel-17 for U2N relay discovery is used for U2U relay discovery as well.

Proposal 6.1: RAN2 discusses the conditions at the relay and remote UE for transmission of discovery message among among 1) upper layer trigger; 2) channel quality between remote and relay UE; 3) conditions on the nieghbour list at the relay UE; 4) conditions on the contents of discovery received by another relay UE; 5) detection of RLF; 6) notification message received from a remote UE.

Proposal 8.2: RAN2 discusses the relay (re)selection criteria for U2U relay among 1) channel quality between remote and relay UE (first and/or second hop); 2) relay load; 3) Whether the PC5 link of the second hop is already established 4) PLMN ID; 5) Cell ID/gNB; 6) Prioritization of the direct link over a relayed link.

Proposal 9.1: RAN2 to discuss whether the indication is needed for whether the gNB is capable of U2U relay discovery

Proposal 10.1: RAN2 to discuss whether to send LS to SA2 on allowable PLMNs, L2ID discovery, and discovery type for U2U relays

Discussion:

Ericsson are not sure what is meant by “discovery type”, but think we could ask how to distinguish U2N and U2U operation.

OPPO think it is too early to send an LS and we should have some discussion first.

Chair thinks we may get an update from SA2 anyway and we can see whether we still have questions.

vivo are fine with not sending the LS, but they would like to clarify that there are proposals regarding control of the discovery message transmission in the AS layer, and they wonder if we should postpone these topics.

InterDigital think it is OK not to send the LS and think some of the proposals in this direction need further discussion.

* [AT119bis-e][427][Relay] Remaining proposals on UE-to-UE relay (InterDigital)

Scope: Discuss P4.2/P6.1/P8.2/P9.1 of R2-2210893.

Intended outcome: Report to CB session in R2-2210914

Deadline: Monday 2022-10-17 1700 UTC

The following documents will not be individually treated

[R2-2209370](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209370_Disussion%20on%20U2U%20relay%20discovery%20and%20(re-)selection.docx) Discussion on U2U Relay Discovery and (Re)selection CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209499](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209499%20Discussion%20on%20NR%20sidelink%20UE%20to%20UE%20relay_cl.docx) Discussion on NR sidelink UE to UE relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209518](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209518%20Relay%20discovery%20and%20(re)selection%20for%20UE-to-UE%20relay.docx) Relay discovery and (re)selection for UE-to-UE relay MediaTek Inc. discussion NR\_SL\_relay\_enh-Core

[R2-2209583](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209583_U2U_Relaying_Discovery_Reselection_Intel.docx) Discovery and reselection with UE-to-UE relaying Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2209619](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209619%20Discussion%20on%20U2U%20relay%20communication.docx) Discussion on U2U relay communication ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209731](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209731+Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209769](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209769%20Discussion%20on%20relay%20discovery%20and%20relay%20selection%20for%20U2U%20relay.doc) Discussion on U2U Relay Discovery and Relay (Re)-selection Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209819](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209819_Discussion%20on%20the%20common%20L2%20L3%20parts%20for%20U2U%20relaying.docx) Discussion on the common L2/L3 parts for U2U relaying vivo discussion

[R2-2209839](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209839-Discovery%20and%20Relay%20selection%20for%20UE-to-UE%20relay.docx) Discovery and Relay (re-)selection for UE-to-UE relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2209922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209922%20U2U%20relay%20discovery%20and%20relay%20selection.docx) Further considerations on U2U relay discovery and relay selection Beijing Xiaomi Mobile Software discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209972](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209972.doc) Discussion on relay discovery and (re)selection for U2U relay Spreadtrum Communications discussion Rel-18

[R2-2210048](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210048%20U2U%20sidelink%20relay_revision_v2.doc) U2U sidelink relay Samsung R&D Institute UK discussion R2-2207729

[R2-2210136](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210136%20Discussion%20on%20U2U%20relay.docx) Discussion on U2U relay CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210221](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210221.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210232%20Basic%20aspects%20for%20U2U%20Relay%20work.docx) Basic aspects for U2U Relay work Lenovo discussion NR\_SL\_relay\_enh-Core R2-2207336

[R2-2210247](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210247%20-%20Relay%20selection%20and%20reselection%20for%20U2U%20relay.docx) Design aspects of relay selection and reselection for U2U relay Ericsson discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210248](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210248%20-%20Discussion%20on%20U2U%20coverage%20scenarios%20and%20RRC%20states.docx) Discussion on U2U coverage scenarios and RRC states Ericsson, vivo, InterDigital Inc discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210251](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210251_Discussion%20on%20SL%20Relay%20Discovery%20and%20(Re-)Selection%20enhanced.docx) Discussion on SL UE-to-UE Relay Discovery and (Re-)Selection Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210263](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210263%20(R18%20SL%20Relay%20WI_AI892%20RelayDiscoverySelection).doc) Discovery and Relay Selection for UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210276](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210276_U2U_discovery.doc) Initial considerations for U2U relay discovery and (re)selection Kyocera discussion

[R2-2210339](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210339%20On%20L2%20and%20L3%20U2U%20relays.docx) On L2 and L3 U2U relays Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core

[R2-2210475](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210475_U2U_relay_discussion.doc) UE-to-UE relay discovery and (re)selection Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210498](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210498.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210580](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210580-Relay%20selection%20and%20connection%20establishment%20for%20UE-to-UE%20relay.docx) Relay selection and connection establishment LG Electronics France discussion Rel-18

L2 specific documents (not treated)

[R2-2209519](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209519%20Connection%20management%20and%20procedures%20for%20L2%20UE-to-UE%20relay.docx) Connection management and procedures for L2 UE-to-UE relay MediaTek Inc. discussion NR\_SL\_relay\_enh-Core

[R2-2210277](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210277_U2U_CP.docx) Initial considerations for U2U L2 relay CP operations Kyocera discussion

### 8.9.3 Service continuity enhancements for L2 UE-to-network relay

Inter-gNB direct/indirect path switching; intra-gNB indirect/indirect path switching; and inter-gNB indirect/indirect path switching, to be supported by reuse of solutions for the other scenarios.

Summary document

[R2-2210782](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210782%20summary%20of%20AI%208.9.3%20service%20continuity%20enhancements.docx) Summary of AI 8.9.3, Service Continuity Enhancements Ericsson España S.A. discussion Rel-18

Easy

Proposal 1 For i2i path switch procedure, introduce a new measurement event based on individual thresholds i.e., Event Z1: Serving L2 U2N Relay UE becomes worse than threshold1 and Candidate L2 U2N Relay UE becomes better than threshold2.

Proposal 2 For i2i path switch procedure, introduce a new measurement event based on an offset for direct comparison i.e., Event Z2: Candidate L2 U2N Relay UE becomes an offset better than Serving L2 U2N Relay UE. At least when using the same measurement quantities for the serving and candidate U2N relay UE. FFS for the case of different SL measurement quantities

Proposal 3 For i2i scenario, re-use the SL-RSRP or SD-RSRP measurement quantities for path switching. FFS: if/how to compare SL-RSRP of serving U2N relay UE and SD-RSRP of candidate U2N relay UE

Proposal 4 For i2i scenario, serving/candidate U2N relay UEs, when SL-RSRP is unavailable, SD-RSRP is used as the measurement quantity.

Proposal 5 For i2d path switch scenario, re-use the existing T304 timer

Proposal 6 For d2i and i2i path switch scenarios, re-use the existing T420 timer.

Proposal 7 RAN2 to wait for RAN3’s progress wrt the decision on path type for d2i, i2d and i2i scenarios and target U2N relay UE for d2i and i2i scenarios. If agreed, skip P8/P9

Discussion:

vivo support P1-P7.

ZTE have some concern for P4; they understand that only one relay UE is contemplated, so only SD-RSRP will be available.

Intel are OK with the proposals if there is a majority view, but they wonder if we really need two different events for the path switch procedure; there could be confusion about when to use which event. OPPO have the same question.

Ericsson understand the remote would use SL-RSRP if available, otherwise SD-RSRP, and always compare them if they are the same measured quantity; thus the FFS in P2.

LG do not support P2; if the remote UE already has a connection with a good quality relay UE, why does it have to find another candidate? So they see event Z2 as unnecessary.

Apple wonder about the term “quantities” in P2/P3/P4; these are different metrics that cannot be compared. On P2, they wonder why we say “at least when using the same measurement quantities”, because for i2i we should almost always have a serving relay with SL-RSRP, and the use of SD-RSRP from the source is a corner case. So they see Z2 as not very necessary.

Ericsson point out that SL-RSRP is only available if there is active exchange of data, so this may not be a corner case; there can be cases where the remote and relay are linked but not active.

InterDigital wonder if we need P7, given that RAN3 are already discussing this and have agreed that the source gNB selects.

Huawei think that for non-relay connection and relay connection we have different L2IDs, so the SL-RSRP for non-relay connection cannot be used for relay case—the remote UE will not know that the two L2IDs are the same peer UE.

NEC think we do not need the FFS in P3 if we do not have P2.

Xiaomi think only having event Z1 is limiting, because the remote UE cannot report a candidate relay that can provide better performance.

ZTE think for candidate relay UEs, only SD-RSRP will be available, so P4 could be modified. OPPO think the candidate relay UE could have non-relay communication with the remote UE. Chair understands that in this case the L2IDs would be different. Qualcomm are not sure if the L2IDs are agreed in SA2 to be different between U2U and U2N relaying. CATT think there is no such agreement.

Xiaomi think we should ask SA2 about whether the L2IDs are always different.

Huawei think the U2U case is not relevant.

Agreements:

Proposal 1 (modified) For i2i path switch procedure, introduce a new measurement event based on individual thresholds i.e., Event Z1: Serving L2 U2N Relay UE becomes worse than threshold1 and Candidate L2 U2N Relay UE becomes better than threshold2. FFS if we also have an event Z2: Candidate L2 U2N Relay UE becomes an offset better than serving L2 U2N Relay UE, and in this case if/how to compare SL-RSRP of serving U2N relay UE and SD-RSRP of candidate U2N relay UE.

Proposal 3 For i2i scenario, re-use the SL-RSRP or SD-RSRP measurement quantities for path switching.

Proposal 4 (modified) For i2i scenario, serving/candidate U2N relay UEs, when SL-RSRP is unavailable, SD-RSRP is used as the measurement quantity. Wording can be revisited if it is determined that L2IDs for U2U and U2N are always different (so that candidate U2N relay UEs would never have SL-RSRP available).

Proposal 5 For i2d path switch scenario, re-use the existing T304 timer

Proposal 6 For d2i and i2i path switch scenarios, re-use the existing T420 timer.

To be Discussed

Proposal 8 For d2i, i2d and i2i scenarios, the source gNB decides on the path type (i.e., direct, or indirect path)

Proposal 9 For d2i and i2i scenarios, down-select from the two options below:

Alt-1: Source gNB to make the final decision on the target U2N relay UE

Alt-2: Target gNB to make the final decision on the target U2N relay UE

Proposal 10 For d2i and i2i scenarios, the source gNB provides at least the selected L2 ID/L2 IDs of a list of candidate U2N relay UEs to the target gNB.

Proposal 11 Reuse Rel-17 DL/UL lossless delivery using PDCP status reports with no specification impact.

Low priority

Proposal 12 For d2i and i2i scenarios, identify and study the issues for selecting a target U2N relay UE in RRC\_IDLE/INACTIVE.

Proposal 13 RAN2 to discuss RRCReconfiguration of the source U2N relay UE during the remote UE’s path switch procedure.

The following documents will not be individually treated

[R2-2209371](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209371%20Consideration%20on%20Service%20Continuity%20Enhancements%20for%20L2%20U2N%20Relay.docx) Consideration on Service Continuity Enhancements for L2 U2N Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209460](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209460_Considerations%20on%20Service%20Continuity%20Enhancement.docx) Considerations on Service Continuity Enhancement NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209498](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209498%20Discussion%20on%20further%20enhancement%20of%20service%20continuity_cl.docx) Discussion on further enhancement of service continuity OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209520](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209520%20Inter-gNB%20path%20switch%20to%20Relay%20UE%20in%20RRC_Idle,%20RRC_Inactive.docx) Inter-gNB path switch to Relay UE in RRC\_Idle, RRC\_Inactive MediaTek Inc. discussion NR\_SL\_relay\_enh-Core

[R2-2209584](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209584%20-%20Service%20continuity%20enhancements%20for%20L2%20U2N%20relaying.docx) Service continuity enhancements for L2 U2N relay Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2209642](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209642_Inter%20gNB%20aspects%20of%20Service%20continuity%20for%20U2N%20relays.docx) Inter-gNB Aspects of Service Continuity for Layer-2 UE-to-Network Relays Ericsson España S.A. discussion Rel-18

[R2-2209730](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209730_Service%20continuity%20enhancements%20for%20L2%20U2N%20relay.docx) Service continuity enhancements for L2 U2N relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209770](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209770%20Discussion%20on%20service%20continuity%20enhancement%20of%20L2%20U2N%20relay.doc) Discussion on Service continuity enhancement of L2 U2N relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209820](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209820%20On%20service%20continuity%20enhancement%20for%20L2%20U2N%20relay.docx) On service continuity enhancement for L2 U2N relay vivo discussion

[R2-2209841](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209841-Service%20continuity%20for%20UE-to-Network%20relay-r1.docx) Service continuity for UE-to-Network relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2209882](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209882%20Discussion%20on%20service%20continuity%20enhancement.docx) Discussion on service continuity enhancement Xiaomi discussion

[R2-2209901](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209901%20Service%20continuity%20enhancement%20for%20SL%20relay.doc) Service continuity enhancement for L2 U2N relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209943](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209943%20Service%20continuity%20in%20U2N%20relay%20case%20v1.1.docx) Service continuity in L2 U2N relay case Lenovo discussion Rel-18

[R2-2209975](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209975%20Service%20continuity%20enhancements%20support%20for%20L2%20U2N%20relay.doc) Service continuity enhancements support for L2 U2N relay Spreadtrum Communications discussion Rel-18

[R2-2210014](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210014%20Service%20continuity%20enhancements%20for%20L2%20U2N%20relay.doc) Service continuity enhancements for L2 U2N relay Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210101](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210101%20U2N%20relay%20inter-gNB%20path%20switching%20service%20continuity.docx) Discussion on service continuity enhancement for Inter-gNB path switching of L2 U2N relay Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210102](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210102%20U2N%20relay%20service%20continuity%20relay%20UE%20Idle.docx) Discussion on service continuity enhancement for Inter-gNB path switching via relay UE in RRC\_IDLE/INACTIVE state Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210112](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210112%20Discussion%20on%20service%20continuity.docx) Discussion on Service Continuity Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210137%20Service%20continuity%20on%20U2N%20relay.docx) Service continuity on U2N relay CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210223](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210223.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210264](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210264%20(R18%20SL%20Relay%20WI_AI893%20Service%20Continuity).doc) Open Issues on Service Continuity for Rel18 InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core Withdrawn

[R2-2210278](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210278_U2N_path_switch.doc) L2 U2N inter-gNB service continuity Kyocera discussion

[R2-2210442](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210442%20(R18%20SL%20Relay%20WI_AI893%20Service%20Continuity).doc) Open Issues on Service Continuity for Rel18 InterDigital France R&D, SAS discussion

[R2-2210474](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210474-Service%20Continuity%20Enhancements%20for%20Layer-2%20U2N%20Relay.doc) Service Continuity Enhancements for Layer-2 U2N Relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210578](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210578-Service%20continuity%20enhancements%20for%20L2%20U2N%20relay.docx) Service continuity enhancements for L2 U2N relay LG Electronics France discussion Rel-18

### 8.9.4 Multi-path relaying

Study the benefit and potential solutions for multi-path support to enhance reliability and throughput. Includes the cases where a UE is connected to the same gNB using one direct path and one indirect path via 1) Layer-2 UE-to-Network relay, or 2) via another UE (where the UE-UE inter-connection is assumed to be ideal).

Email discussion report

[R2-2210027](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210027%20Final%20Report%20of%20%5b408%5d%20MP.doc) Report of [Post119-e][408][Relay] Path operations in multi-path relaying LG Electronics France report Rel-18 NR\_SL\_relay\_enh-Core

[Path management cases]

Proposal 1-1A: The following cases are proposed to be supported for Scenario 1.

A. The remote UE configured only on the direct path adds the indirect path under the same gNB;

B. The remote UE configured only on the indirect path adds the direct path under the same gNB;

C. The remote UE configured with multi-path releases the indirect path;

D. The remote UE configured with multi-path releases the direct path;

G. The remote UE configured with multi-path changes to a new relay UE for the indirect path while keeping the direct path under the same gNB.

Proposal 1-1B: The following case is proposed to be not supported for Scenario 1.

F. The remote UE configured with multi-path keeps the serving relay UE for the indirect path and the serving cell of the remote UE for the direct path while the serving relay UE changes the serving cell of the relay UE under the same gNB;

Discussion:

Qualcomm agree with P1-1a technically, but they think cases A and D can be clarified in the wording; they would rather say “connected” instead of “configured”. Chair thinks “connected” might suggest RRC\_CONNECTED.

OPPO think based on contributions, scenario G may have some complexity, e.g., addressing direct link RLF during the change. So they suggest that we support A-D and put FFS on G; similarly they would not like to support E.

Nokia have the same understanding as OPPO and think scenario G can be achieved by C+A.

vivo are fine with P1-1A but prefer “operating” rather than “configured”. On P1-1B, they understand most companies felt this was a group handover case, and they would like to exclude it conditional on this interpretation: “in case of group mobility”.

Intel share OPPO’s view on G and think it pertains to service continuity intra-cell i2i. For C and D, they want to clarify that it applies when the released path is not the first established path.

Samsung think we should support G if it can be supported as A+C, and we do not need to exclude it in the study phase.

Apple and Qualcomm think G can be based on i2i service continuity.

LG think if we have the FFS on G, it suggests that the separate A+C procedures would be separate reconfigurations, but they see that the release-and-add could be done in a single reconfiguration.

Agreements:

Proposal 1-1A (modified): The following cases are to be supported for Scenario 1.

A. The remote UE operating only on the direct path adds the indirect path under the same gNB;

B. The remote UE operating only on the indirect path adds the direct path under the same gNB;

C. The remote UE operating in multi-path releases the indirect path;

D. The remote UE operating in multi-path releases the direct path;

G. The remote UE operating in multi-path changes to a new relay UE for the indirect path while keeping the direct path under the same gNB. FFS if this case would be supported via separate release-and-add (A+C in separate reconfigurations) or a single switch procedure (e.g. similar to i2i service continuity).

Proposal 1-1B (modified): The following case is to be not supported for Scenario 1 as a group mobility scenario.

F. The remote UE configured with multi-path keeps the serving relay UE for the indirect path and the serving cell of the remote UE for the direct path while the serving relay UE changes the serving cell of the relay UE under the same gNB;

Proposal 1-1C: Whether to support the following case can be further discussed for Scenario 1.

E. The remote UE configured with multi-path changes the serving cell of the remote UE for the direct path while keeping the serving relay UE for the indirect path under the same gNB.

Discussion:

Xiaomi think this is similar to G above and can be supported by release-and-add or legacy handover procedure.

Qualcomm have the same view as Xiaomi. Nokia also.

OPPO see some difference from G, because the UE keeps the indirect path. They think it could be supported by separate release-and-add but have some doubts if it is feasible to treat it as a single procedure.

Samsung also see this case as similar to G and do not understand what part of the procedure OPPO see as a showstopper.

CATT and MediaTek agree with Xiaomi.

Ericsson agree with OPPO.

vivo think there is no major difference from G.

Ericsson think it is too early to agree on this case and have a similar understanding to OPPO.

LG think it can be simply supported by the separate release-and-add, and they think “keeping” the serving relay UE may be the confusing phrase. They understand that when the remote UE performs direct-path change, it needs to release and add also the serving relay UE.

Apple think when the remote UE changes cell, it is not so likely that it will be able to keep the same relay UE. LG tend to agree, but considering both scenario 1 and 2, E seems a more usual case in scenario 2 because of the semi-static configuration, and they think it can be applied by the same procedure to scenario 1 although they agree it may not be so likely in scenario 1.

Ericsson share Apple’s concern and wonder why we should optimise for this scenario, so they would like to exclude the possibility of a single procedure. For scenario 2, they think we should not mix the discussions.

InterDigital think we have not concluded that the “serving” cell is associated with the direct path.

Ericsson think there is a limited technical advantage and we should exclude the single procedure.

Xiaomi consider that the impact of supporting E by legacy handover is limited, and if we support it only in scenario 2 we would have a scenario 2-dedicated solution.

Agreement:

The following case can be supported via separate release-and-add for scenario 1 (B+D in separate reconfigurations):

E. The remote UE operating in multi-path changes the direct path to a different cell of the same gNB while using the serving relay UE for the indirect path under the same gNB.

FFS if a single procedure for this case would be supported.

Proposal 1-2A: The following cases are proposed to be supported for Scenario 2.

A. The remote UE configured only on the direct path adds the indirect path under the same gNB;

C. The remote UE configured with multi-path releases the indirect path;

Proposal 1-2B: The following case is proposed to be not supported for Scenario 2.

F. The remote UE configured with multi-path keeps the serving relay UE for the indirect path and the serving cell of the remote UE for the direct path while the serving relay UE changes the serving cell of the relay UE under the same gNB;

Proposal 1-2C: Whether to support the following case can be further discussed for Scenario 2.

B. The remote UE configured only on the indirect path adds the direct path under the same gNB;

D. The remote UE configured with multi-path releases the direct path;

E. The remote UE configured with multi-path changes the serving cell of the remote UE for the direct path while keeping the serving relay UE for the indirect path under the same gNB;

G. The remote UE configured with multi-path changes to a new relay UE for the indirect path while keeping the direct path under the same gNB.

Discussion:

OPPO understand that P1-2C is still for further discussion. They understand that these cases had more opponents than proponents and we may not need to leave them as FFS.

Ericsson think G is useful for scenario 2, because the link to the relay UE may degrade.

Qualcomm think B/D/E/G make sense for scenario 2 in factory or IoT cases, where the remote UE may go out of coverage. They think these cases may be supported by UE implementation and see that no standards enhancement is needed to support them.

vivo also think B/D/E/G come almost for free. They also agree with Ericsson that G is practical.

CMCC also think G is useful, but for B and D, they think the direct path is always present in scenario 2, so they do not see benefit in these cases. They also think we should focus on simple scenarios for the first release.

Agreements:

Proposal 1-2A: The following cases are proposed to be supported for Scenario 2.

A. The remote UE configured only on the direct path adds the indirect path under the same gNB;

C. The remote UE configured with multi-path releases the indirect path;

Proposal 1-2B: The following case is proposed to be not supported for Scenario 2.

F. The remote UE configured with multi-path keeps the serving relay UE for the indirect path and the serving cell of the remote UE for the direct path while the serving relay UE changes the serving cell of the relay UE under the same gNB;

Proposal 1-2C: Whether to support the following case can be further discussed for Scenario 2.

B. The remote UE configured only on the indirect path adds the direct path under the same gNB;

D. The remote UE configured with multi-path releases the direct path;

E. The remote UE configured with multi-path changes the serving cell of the remote UE for the direct path while keeping the serving relay UE for the indirect path under the same gNB;

G. The remote UE configured with multi-path changes to a new relay UE for the indirect path while keeping the direct path under the same gNB.

[Primary path]

Proposal 2-1A: The concept of the primary path is considered for RRC as a working assumption at least with the following characteristics in Scenario 1:

1. When gNB configures a second path for the remote UE that has established an RRC connection on a first path for MP, the first path is considered as the primary path for the remote UE (based on the aspect A).

Discussion:

OPPO think we have discussed this issue a lot, and they find it hard to accept a WA in this direction; they think we still need to clarify the issue before pursuing a solution.,

Nokia understand that the proposal just says how to configure the primary path, not what the role of the primary path is, and we need to discuss the role and the procedures before deciding that we have it. So they agree with OPPO and want to see the underlying issue.

Xiaomi see two interpretations of the primary path: DC-like (linked to bearer configuration) and multi-path-like (where both paths may not be equally important, e.g., SRBs on one path and offloading on the other). So they think there could be a distinguished path for maintenance of the RRC connection, which we could call e.g. “anchor path” instead of “primary path”.

ZTE also think it is not necessary to introduce a primary path for the control plane; they see that nothing is broken if we do not have it. E.g., for RRC establishment/reestablishment, it can be based on cell or relay reselection; for RRC signalling, they think it can be based on gNB configuration how the bearer is arranged.

CMCC think regardless of the name, the point is to know which path we use to manage RLF or mobility, and they think this could be the direct path as a baseline or configured for either path as more of an optimisation.

Qualcomm think the UE can already connect to a single gNB using DC architecture, so if we reuse the DC-based architecture for CP, it can save implementation efforts and it matches what we decided for UP. They see that we need to distinguish PCell and PSCell anyway, and from this point of view we need to distinguish the two paths.

Lenovo are fine with a concept of the primary path and think it could be helpful to design the procedures, allowing reuse of legacy designs as much as possible. They understand that the first path could be considered by default as the primary path, but it could be reconfigurable by the gNB.

Huawei also have some concern about the proposed WA and find the term “primary path” confusing; in the current spec it is used to indicate primary RLC entity, and they do not see a connection to the DC model in RRC modelling. If we want to differentiate PCell or PSCell, they think other terms could be used, e.g. “first path”/”second path”.

LG indicate the original proposal was based on levels of support in the email discussion, but some companies have become more sceptical and there is more concern about the concept now. At the same time, they see that the primary RLC entity can still be applied to multi-path, so there may be no issue with the primary path there, and regarding the CP aspect, as other companies suggested, they think we may need to discuss on procedures rather than the concept. Considering the contributions to this meeting, they understand that some use cases have been proposed and we can further discuss if the primary path is needed based on those.

Proposal 2-1B: RAN2 is suggested to discuss whether the primary path for RRC can be additionally characterized as follows in Scenario 1:

1. The cell serving the primary path corresponds to the PCell of the remote UE (based on the aspect D).

2. The gNB can indicate which path is configured as the primary path for the remote UE e.g. during RRC reconfiguration or mobility (based on the aspect C and E).

3. The primary path is the path where a message on a SRB is transmitted (if the message is transmitted on one path only). FFS: whether the SRB can be configured as direct bearer, indirect bearer or split bearer. (based on the aspect I)

4. The remote UE re-establishes an RRC connection on the primary path e.g. upon link failure (based on the aspect B).

5. The remote UE may trigger the RRC re-establishment based on RLF on the primary path only (based on the aspect J)

Proposal 2-1C: RAN2 is suggested to further discuss the following RRC aspects for Scenario 1:

- Whether the remote UE can acquire system information from any of both paths.

- Whether the remote UE performs RLM on both paths.

Proposal 2-2A: The concept of the primary path is considered for RRC as a working assumption at least with the following characteristics in Scenario 2:

1. When gNB configures a second path for the remote UE that has established an RRC connection on a first path for MP, the first path is considered as the primary path for the remote UE (based on the aspect A).

Proposal 2-2B: RAN2 is suggested to discuss whether the primary path for RRC can be additionally characterized as follows in Scenario 2:

1. The cell serving the primary path corresponds to the PCell of the remote UE (based on the aspect D).

2. The gNB can indicate which path is configured as the primary path for the remote UE e.g. during RRC reconfiguration or mobility (based on the aspect C and E).

3. The primary path is the path where a message on a SRB is transmitted (if the message is transmitted on one path only ). FFS: whether the SRB can be configured as direct bearer, indirect bearer or split bearer. (based on the aspect I)

4. The remote UE re-establishes an RRC connection on the primary path e.g. upon link failure (based on the aspect B).

5. The remote UE may trigger the RRC re-establishment based on RLF on the primary path only (based on the aspect J)

Proposal 2-2C: RAN2 is suggested to further discuss the following RRC aspects for Scenario 2:

- Whether the remote UE can acquire system information from any of both paths.

- Whether the remote UE performs RLM on both paths.

Proposal 3-1: The primary path for control plane can be either the direct or the indirect path in Scenario 1.

Proposal 3-2: RAN2 excludes the case that the primary path is always the indirect path for Scenario 2. RAN2 will further discuss whether the primary path is always the direct path or can be either the direct or the indirect path for Scenario 2.

Proposal 4-1A: For Scenario 1, some SRB(s) can be configured on the primary path only while other SRB(s) can be configured on both the primary path and the secondary path.

Alternative proposal 4-1A (if proposal 2-1A is not agreed): For Scenario 1, some SRB(s) can be configured on one path only while other SRB(s) can be configured on both paths.

Proposal 4-2A: For Scenario 2, some SRB(s) can be configured on the primary path only while other SRB(s) can be configured on both the primary path and the secondary path.

Alternative proposal 4-2A (if proposal 2-2A is not agreed): For Scenario 2, some SRB(s) can be configured on one path only while other SRB(s) can be configured on both paths.

Discussion (considering the alternative forms of the proposals):

vivo think we only have SRB1 and SRB2 to consider, and we can specify that SRB1 is only on one path while SRB2 can be on both paths.

OPPO note that we have not decided about the adaptation layer for scenario 2, and they understand that the solution proposed for the UE to distinguish SRB/DRB is to look at the ingress RLC channel, which does not apply in scenario 2; so they wonder how the UE will distinguish SRBs configured on both paths from DRBs in scenario 2, especially if there is no adaptation layer.

Qualcomm want to clarify for scenario 1 that if the SRB is configured for both paths, it is only used for duplication. For scenario 2 they think we may need further consideration based on whether there is an adaptation layer or not.

Xiaomi are fine with the proposals but think the wording can be improved to clarify that the “one path” can be either direct or indirect path.

InterDigital are a bit confused about the wording wrt “some SRB(s)” and “other SRB(s)”.

LG understand that “one path only” means the path can be direct or indirect, and “some SRB” and “other SRB” may be misleading; the point is to indicate per-SRB configuration.

Qualcomm understand that SRB1 and SRB2 should be on the same path, and then it would be aligned with the DC configuration. This way from the UE pov, there would be no need to distinguish which path they are on. Their understanding of the proposal is that it means if an SRB needs duplication, it could be configured as a split bearer.

Ericsson have the same question as Qualcomm: Can we configure SRB1 on one path and SRB2 on another? They do not see this as a sensible configuration.

vivo wonder about scenario 2: Are we excluding the case of split SRB? They do not see the problem that would require an adaptation layer for this case; in their understanding there is no relation between the split SRB and having an adaptation layer.

Samsung do not understand why we cannot use the indirect path in scenario 2 for SRB transmission; they think we can have the RLC channel identified based on having SRAP for the Uu link, and if we want to ensure the same performance, we need the split for PDCP duplication. They see this as a fundamental issue. Qualcomm and Huawei also support duplication for both scenarios.

CATT agree that for scenario 1, SRB1 and SRB2 should be on the same path. For scenario 2, they agree with Samsung that duplication may be needed and both paths should be feasible.

Ericsson think we need to aim for commonality between scenarios 1 and 2. Regarding OPPO’s concern, they think UE implementation can handle it by introducing some LCID-like characteristic.

LG think duplication can be supported, but they think we may also need the non-duplication case even for the split SRBs. OPPO agree.

LGE think on scenario 2 we could have the same statement as scenario 1 with the condition that the adaptation layer is configured. They acknowledge the SRB/DRB differentiation issue, but they think an adaptation layer can resolve it and allow applying the same cases to both scenarios.

CATT understand that SRB split == SRB duplication because there is no data offload for SRBs. OPPO understand that the SRB can be configured as not duplicated; CATT do not understand what the point of the split would then be.

Agreement:

For scenario 1, SRB1 and SRB2 can be configured on either the direct or the indirect path, or on both at least with duplication. FFS if they can be configured on different paths from one another.

For scenario 2, SRB1 and SRB2 can be configured at least on the direct path. FFS if there are restrictions on the configuration and if they can be configured on both paths.

[Split bearers]

Proposal 5-1: MP split bearer is supported for SRB1 and SRB2 in Scenario 1. FFS for SRB4.

Proposal 5-2: MP split bearer is supported for SRB1 and SRB2 in Scenario 2. FFS for SRB4.

Proposal 6-1: The primary RLC entity of the MP split bearer for SRB is always configured on the primary path of the control plane for Scenario 1.

Alternative proposal 6-1 (if proposal 2-1A is not agreed): The primary RLC entity of the MP split bearer for SRB is always configured on one path for Scenario 1. FFS which path.

Proposal 6-2: The primary RLC entity of the MP split bearer for SRB is always configured on the primary path of the control plane for Scenario 2.

Alternative proposal 6-2 (if proposal 2-2A is not agreed): The primary RLC entity of the MP split bearer for SRB is always configured on one path for Scenario 2. FFS which path.

Proposal 7-1: The primary RLC entity of the MP split bearer for DRB can be configured on either the primary path or the secondary path of the control plane for Scenario 1.

Alternative proposal 7-1 (if proposal 2-1A is not agreed): The primary RLC entity of the MP split bearer for DRB can be configured on any of the paths for Scenario 1.

Proposal 7-2: The primary RLC entity of the MP split bearer for DRB can be configured on either the primary path or the secondary path of the control plane for Scenario 2.

Alternative proposal 7-2 (if proposal 2-2A is not agreed): The primary RLC entity of the MP split bearer for DRB can be configured on any of the paths for Scenario 2.

Proposal 8-1: PDCP duplication is supported for the MP split bearer in Scenario 1 based on the existing framework.

Discussion:

Nokia think for the multi-path split bearer, the PDCP CPDU can be transmitted to both RLC entities.

LG consider that this aspect can be discussed later. Nokia’s concern is that the primary RLC entity leaves it unclear if the CPDU is transmitted only to the primary or to both.

Ericsson think there is no need to duplicate the CPDU.

Nokia think we need to discuss if the primary RLC entity concept is needed at all in this context.

Agreements:

Alternative proposal 7-1 (if proposal 2-1A is not agreed) (modified): FFS CPDU submission; if it is supported, the primary RLC entity of the MP split bearer for DRB can be configured on any of the paths for Scenario 1.

Proposal 8-1 (modified): PDCP DRB duplication is supported for the MP split bearer in Scenario 1 based on the existing framework.

Proposal 8-2 (modified): PDCP DRB duplication is supported for the MP split bearer in Scenario 2 based on the existing framework.

[Adaptation layer for scenario 2]

Observation 9A: majority of companies see the benefit of using the adaptation layer over Uu link. But, there is no majority’s view on the adaptation layer over non-3GPP link.

Proposal 9A: RAN2 is suggested to study need of an adaptation layer on the UE-to-UE link and the Uu link between relay UE and the gNB for Scenario 2, considering whether the following aspects can/should be supported in Scenario 2 without an adaptation layer:

- Possibility of restriction to the relay UE serving only one remote UE

- Possibility of restriction to 1:1 bearer mapping only over non-3GPP UE-to-UE link and 3GPP Uu link.

- Mapping a PDCP entity of the remote UE to a RLC entity of the relay UE to ensure that a PDCP PDU is delivered to an intended PDCP entity or RLC entity for support of more than one RB

- Possibility to support interoperability between two UEs from different vendors

- Ensuring identification of data own by the relay UE and data relayed from/to the remote UE over the Uu link .

Proposal 9B: SRAP is considered as baseline for design of the adaptation layer, if needed, for scenario 2.

Discussion:

LG think a possible compromise solution is either to have a configurable adaptation layer for scenario 2 (where we would need to specify the adaptation layer) or to use an SRAP-based design on Uu and a new adaptation layer on the non-3GPP link. They think the latter is reasonable based on what we did for LTE-WiFi aggregation.

Ericsson do not think an adaptation layer is needed over the non-3GPP interface and we should not spend the effort to study it; the transmission medium could be very different for different interfaces and we cannot have a generic adaptation layer. They find even a configurable adaptation layer on the non-3GPP link not acceptable but are open for discussion on Uu.

vivo think the main motivation for the adaptation layer has not been fully clarified. They understand that it is not needed in the case of a fixed mapping of one remote per relay. They agree with Ericsson that an adaptation layer for arbitrary transport may not be feasible. They think we could look at it in the normative phase, but for now different companies have different understandings. They can discuss adaptation on Uu but think it is not necessary on the ideal link.

ZTE think for the Uu interface, they can live with the 1:1 relay:remote restriction, but without the adaptation layer it may be difficult to have interoperability between vendors. They agree it could be a configurable solution.

CMCC think the intention of scenario 2 is to boost uplink throughput, so the linking topology will be one remote per relay at least in this release; so they see that adaptation is not needed to distinguish the remote UE, and if there is 1:1 bearer mapping, we do not need an adaptation layer for bearer mapping either. However, they can accept a configurable adaptation layer. They understand that removing the SRAP layer is not creating a new behaviour and fits with pursuing commonality between the scenarios.

MediaTek can accept that the adaptation layer would be configurable. Wrt other solutions like LWA, they prefer not to create a new adaptation layer for this case.

Apple have a similar view to ZTE regarding interoperability, so they think we need a configurable adaptation layer, but they want to understand if it applies also to Uu; they understand that the adaptation layer would be configurable on the ideal link and mandatory on Uu.

LGE have the same understanding as Apple, but we can discuss further.

Ericsson think this is not a blocking issue and we could decide in WI phase.

CMCC think we have discussed for two rounds on this, and the Uu is less controversial than the UE-to-UE link.

Ericsson think a configurable adaptation layer is not a good way forward.

LG think we cannot reach consensus now on the UE-to-UE link, but the majority view was to have an adaptation layer on Uu.

CMCC think there is a majority view for a configurable adaptation layer on the UE-to-UE link.

LG note that configurability was not discussed in the email discussion.

Xiaomi think the reason companies have different understanding is that the assumptions for the ideal connection are not clear. If we only support 1:1 mapping, the adaptation layer may not be needed, and if both UEs are assumed to come from the same vendor, there is no interoperability concern.

Intel have a similar view to Xiaomi.

* [AT119bis-e][425][Relay] Adaptation layer for scenario 2 (LG)

Scope:

* Discuss the potential for an adaptation layer on the Uu and UE-to-UE links in scenario 2, considering the possibility of making the adaptation layer configurable/optional on either link, and focussing on whether the following aspects can/should be supported in Scenario 2 without an adaptation layer:

- Possibility of restriction to the relay UE serving only one remote UE

- Possibility of restriction to 1:1 bearer mapping only over non-3GPP UE-to-UE link and 3GPP Uu link.

- Mapping a PDCP entity of the remote UE to a RLC entity of the relay UE to ensure that a PDCP PDU is delivered to an intended PDCP entity or RLC entity for support of more than one RB

- Possibility to support interoperability between two UEs from different vendors

- Ensuring identification of data own by the relay UE and data relayed from/to the remote UE over the Uu link.

* Consider whether SRAP is a suitable baseline for a scenario 2 adaptation layer, considering both Uu and the ideal link (potentially different conclusions for the two links)

Intended outcome: Report to CB session in R2-2210912

Deadline: Monday 2022-10-17 1700 UTC

Treat section 3 only (P11-P28)

[R2-2209375](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209375%20-%20Discussion%20on%20multi-path%20Relay_V2.docx) Discussion on multi-path Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

=> Revised in R2-2210780

[R2-2210780](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210780%20-%20Discussion%20on%20multi-path%20Relay_V3.docx) Discussion on multi-path Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 11 For scenario-1 of multi-path relay, R2 does not pursue applying multi-path relay to the procedures of SIB delivery, paging delivery, RRC setup/resume and re-establishment.

Proposal 12 For scenario-1 of multi-path Relay, R2 focus on the application of multi-path relay to RRC\_CONNCTED UEs only, i.e., after RRC setup/resume / re-establishment procedure.

[PDCP duplication in scenario 1]

Proposal 13 For scenario-1 of multi-path Relay, for PDCP duplication, R2 follows legacy design as a baseline, including at least 1) all RLC entities have the same RLC mode, 2) PDCP control PDUs are not duplicated and always submitted to the primary RLC entity. 3) RRC can set the duplication state (but always activated for SRB).

Proposal 14 For scenario-1 of multi-path Relay, for PDCP duplication, allows dynamic duplication (de)activation controlled by MAC-CE delivery via direct link.

Proposal 15 For scenario-1 of multi-path Relay, for PDCP duplication, the legacy “Duplication Activation/Deactivation MAC CE” and “Duplication RLC Activation/Deactivation MAC CE” can be adopted.

Proposal 16 For scenario-1 of multi-path Relay, for PDCP duplication, R2 does not pursue LCH-to-carrier mapping restriction.

Proposal 17 For scenario-1 of multi-path Relay, for PDCP duplication, R2 discuss whether to pursue the legacy behavior of “When an RLC entity acknowledges the transmission of a PDCP PDU, the PDCP entity shall indicate to the other RLC entity(ies) to discard it”.

Proposal 18 For scenario-1 of multi-path Relay, PCell is always configured on the direct path when configured.

Proposal 19 For scenario-1 of multi-path Relay, in case of path switching, a RRC\_IDLE/RRC\_INACTIVE Relay UE initiates RRC connection establishment procedure upon the message received from a Remote UE via SL-RLC, not limited to SL-RLC0/1.

Proposal 20 For scenario-1 of multi-path Relay, UE performs RLM on both direct and indirect path.

Proposal 21 For scenario-1 of multi-path Relay, in case of Uu-RLF, if SRB1 is configured on PC5, suspend the direct path transmission and trigger report to network via indirect path to report the failure via MCGFailureInformation message. Otherwise, if SRB1 is not configured on PC5, RRC Re-establishment is initiated.

Proposal 22 For scenario-1 of multi-path Relay, in case of PC5-RLF, f SRB1 is configured on Uu, suspend the indirect path transmission and trigger report to network via direct path to report the failure via SidelinkUEInformation message. Otherwise, if SRB1 is not configured on Uu, RRC Re-establishment is initiated.

* [AT119bis-e][426][Relay] Control plane aspects for multi-path (OPPO)

Scope: Discuss P11/P12/P18/P19/P20 of R2-2209375, considering applicability to both scenarios 1 and 2.

Intended outcome: Report to CB session in R2-2210913

Deadline: Monday 2022-10-17 1700 UTC

[Scenario 2]

Proposal 23 For scenario-2 of multi-path relay, follow the conclusion for scenario-1 unless stated otherwise.

Proposal 24 For scenario-2 of multi-path relay, R2 not pursue support of RRC\_IDLE / RRC\_INACTIVE relay UE during path switching.

Proposal 25 For scenario-2 of multi-path relay, for single-direct-path to multi-path switching, remote (or relay) UE report the ID (FFS what the ID is) of the relay (or remote) UE to network, and network provides the configuration of the indirect path to remote (or relay) UE. It is up to relay/remote UE implementation to establish inter-UE connection before/upon network configuration.

Proposal 26 For scenario-2 of multi-path relay, for multi-path to single-direct-path switching, it can be triggered by remote (or relay) UE reporting the inter-UE connection failure to network.

Proposal 27 For Scenario-2 of multi-path Relay, direct path is always configured (i.e., not pursue indirect-path only scenario) to carry PCell role.

Proposal 28 For scenario-2 of multi-path Relay, in case of Uu-RLF, remote UE trigger RRC Re-establishment procedure as in legacy.

[R2-2209372](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209372_Discussion%20on%20Multi-path%20for%20Scenario1.docx) Discussion on Multi-path for Scenario 1 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209373](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209373_Discussion%20on%20the%20Details%20of%20Scenario%202.docx) Discussion on the Details of Scenario 2 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209461](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209461_Considerations%20on%20Multipath%20of%20Sidelink%20Relay.docx) Considerations on Multipath of Sidelink Relay NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209585](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209585_Discussion%20on%20Multi-path%20Relaying_Intel.docx) Discussion on Multi-path Relaying Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2209617](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209617-Further%20discussion%20on%20multi-path%20relaying.docx) Further discussion on the multi-path relaying ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209618](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209618-Design%20consideration%20on%20the%20UE%20aggregation.docx) Design consideration on the UE aggregation ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209681](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209681%20Multipath%20support%20for%20remote%20UE%20v01.docx) Multipath support for remote UE MediaTek Inc. discussion Rel-18

[R2-2209682](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209682_Multipath%20relaying%20for%20Scenario-1%20and%20Scenario-2.docx) Multipath Relaying for Scenario-1 and Scenario-2 Ericsson España S.A. discussion Rel-18

[R2-2209732](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209732%20Discussion%20on%20RLF%20handling%20for%20multi-path%20relaying.docx) Discussion on RLF handling for multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209749](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209749%20Support%20of%20Multi-path%20relaying.docx) Support of Multi-path Relaying Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core

[R2-2209771](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209771%20Discussion%20on%20multi-path%20support.doc) Discussion on multi-path relaying support Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209821](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209821_%20Multi-path%20UE%20aggregation%20on%20PC5%20and%20Ideal-link.docx) Multi-path UE aggregation on PC5 and Ideal-link vivo discussion

[R2-2209840](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209840-Discussion%20on%20multi-path%20operation%20for%20UE-to-Network%20relay.docx) Discussion on multi-path relay for Scenario 1 and Scenario 2 Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Perf

[R2-2209881](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209881%20Discussion%20on%20multipath.docx) Discussion on multi-path Xiaomi discussion

[R2-2209944](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209944.docx) Discussion on Multi-path relaying Lenovo discussion Rel-18

[R2-2209945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209945%20Second%20path%20establishment%20for%20Multi-Path%20v1.1.docx) Second path establishment for Multi-Path Lenovo discussion Rel-18

[R2-2209976](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209976%20Discussion%20on%20multi-path%20relaying.doc) Discussion on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2210031](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210031%20Multi-path%20relaying%20for%20NR%20sidelink%20relay%20enhancements.doc) Multi-path relaying for NR sidelink relay enhancements LG Electronics France discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210063](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210063_SLRelay_PrimaryPath_v1.doc) Discussion on primary path for CP in sidelink relay enhancement Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210064](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210064_SLRelay_Multipath_others_v1.doc) Discussion on key issues for multipath in sidelink relay enhancement Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210138](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210138%20Primary%20path%20for%20CP%20in%20multi-path.docx) Primary path for CP in multi-path CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210139%20Consideration%20on%20UE%20aggregation.docx) Consideration on UE aggregation CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210224](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210224.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210265](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210265%20(R18%20SL%20Relay%20WI_AI894%20MultipathAspects).doc) Architecture Assumptions for Multi-path InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210425](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210425%20(R18%20SL%20Relay%20WI_AI894%20MultipathBearer.doc) SRB and DRB Configurations for Multi-path InterDigital France R&D, SAS discussion

[R2-2210476](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210476_MP_bearer.doc) discussion on multi-path bearer Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210477](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210477_MP_resource_allocation.doc) resource allocation for multi-path relaying Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210497](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210497.docx) Discussion on Rel-18 multi-path via SL relay and UE aggregation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

Withdrawn/Not available

[R2-2210266](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210266%20(R18%20SL%20Relay%20WI_AI894%20MultipathBearer.doc) SRB and DRB Configurations for Multi-path InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core Withdrawn

### 8.9.5 DRX

Study the gains and, if needed, specify signalling between gNB and relay UE in sidelink mode 2 to assist the determination of the sidelink DRX configuration used for remote UE. This agenda item will be handled at lower priority.

[R2-2209376](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209376%20-%20Discussion%20on%20SL-DRX%20for%20Relay.docx) Discussion on SL-DRX for Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209774](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209774%20Discussion%20on%20SL-DRX%20for%20L2%20relay.doc) Discussion on SL DRX for L2 Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2209822](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209822_Discussion%20on%20SL%20DRX%20for%20L2%20U2N%20Remote%20UE.docx) Discussion on SL DRX for L2 U2N Remote UE vivo discussion

[R2-2209842](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209842-SL%20DRX%20for%20L2%20U2N%20relay.docx) SL DRX for L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2209883](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2209883%20Discussion%20on%20SL%20DRX%20in%20U2N%20relay.docx) Discussion on SL DRX in U2N relay Xiaomi discussion

[R2-2210222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210222.doc) Discussions on Sidelink Relay DRX Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2210499](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210499.doc) On sidelink DRX for L2 U2N relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2210579](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210579-sidelink%20DRX%20for%20L2%20U2N%20relay.docx) SL DRX for L2 U2N relay LG Electronics France discussion Rel-18

## 8.18 R18 Other

Misc Impacts from Other RAN WGs and TSGs (incl MC Enhancements). LS ins for Rel-18 topics that has no RAN WI.

Time budget: 0.5 TU

Tdoc Limitation: -

[R2-2210320](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210320%20RelayPosSIBs.docx) Relaying of posSIBs Ericsson discussion Rel-18

[R2-2210367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202210%20-%20RAN2_119bis-e,%20Online\Extracts\R2-2210367_(SL%20Relay).docx) On Positioning Support for L2 UE-to-Network Remote UEs Qualcomm Incorporated discussion