3GPP TSG-RAN WG2 Meeting #122 R2-23xxxxx

Incheon, Korea, 22-26 May 2023

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# At-Meeting Email Discussions

This subsection is not an Agenda Item. It enumerates the email discussions allocated during the meeting. This subsection will be moved to an Annex in the final version of the session report.

* [AT122][400][POS][Relay] Organisational Nathan - Positioning/Relay (MediaTek)

Scope: Organisational discussions and announcements, as needed during the meeting week.

Intended outcome: Well-informed participants

Deadline: Friday 2023-05-26 1700 KST

* [AT122][401][POS] Sidelink positioning summary proposals (Xiaomi)

Scope: Discuss and gauge support on the proposals in R2-2306757, converge on easily agreeable parts, and identify discussion points for the online session on Wednesday 2023-05-24.

Intended outcome: Summary to online session in R2-2306671

Deadline: Tuesday 2023-05-23 2000 KST

* [AT122][402][Relay] Multi-path relay summary proposals (OPPO)

Scope: Discuss and gauge support on the proposals in R2-2306556, converge on easily agreeable parts, and identify discussion points for the online session on Tuesday 2023-05-23.

Intended outcome: Summary to online session in R2-2306672

Deadline: Tuesday 2023-05-23 1100 KST

* [AT122][403][POS] 1-symbol PRS CR check (ZTE)

Scope: Check the CRs in R2-2306079 / R2-2306080 / R2-2306081 / R2-2306082 / R2-2306083

Intended outcome: CRs agreeable in principle

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][404][POS] GNSS LOS/NLOS CR check (Vodafone)

Scope: Check the CRs in R2-2306535 / R2-2306536 / R2-2306537, taking into account the exposition in R2-2306534.

Intended outcome: CRs agreeable in principle

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][405][POS] Yaw and APC in Rel-18 (Swift)

Scope: Check the proposals in R2-2305265 and adapt the TPs into CRs if agreeable.

Intended outcome: Report to CB session in R2-2306673 and potentially CRs agreeable in principle

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][406][POS] Positioning for remote UEs CR check (CATT)

Scope: Check the CRs in R2-2305852 / R2-2305854 / R2-2305857 / R2-2305859 in light of the exposition in R2-2305850 / R2-2305865, and evaluate the proposals in R2-2306019.

Intended outcome: Report to CB session in R2-2306674 and CRs agreeable in principle

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][407][POS] Rel-15/16 positioning CR check (Intel)

Scope: Check the CRs in R2-2306459 / R2-2306460 / R2-2306451 (in light of the exposition in R2-2306409), R2-2306027 / R2-2306028, and R2-2306084 / R2-2306085.

Intended outcome: Agreeable CRs, and report in R2-2306699

Deadline: Thursday 2023-05-25 1100 KST

* [AT122][408][POS] Reply LS to CT4 on integrity parameters (Huawei)

Scope: Draft a reply to R2-2304608 in line with the agreements reached online.

Intended outcome: Approvable LS in R2-2306681

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][409][POS] Update of LPP rapporteur CR (Qualcomm)

Scope: Update R2-2305895 in line with the discussion of this meeting.

Intended outcome: Agreeable CR in R2-2306676

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][410][Relay] SRAP corrections (ZTE)

Scope: Check the intention of the first change and the details of wording for the CR in R2-2305211.

Intended outcome: Agreeable CR in R2-2306679 and report in R2-2306698

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][411][Relay] NOTE on remote UE reception of SIB1 (Huawei)

Scope: Attempt to draft a NOTE capturing the intention of the 1st change in R2-2306194, without changing the normative UE behaviour. If it is concluded that normative impact is needed, the issue can be postponed.

Intended outcome: Report in R2-2306683 and agreeable CR in R2-2306684 (to Friday CB session)

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][412][Relay] CR on discovery setting in SIB12 (Nokia)

Scope: Revise the CR in R2-2305573, adding a condition for discovery monitoring. Can discuss if something is needed in section 5.8 in addition to the existing change in 5.2.

Intended outcome: Agreeable CR in R2-2306685

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][413][Relay] Relay miscellaneous CR to 38.331 (Huawei)

Scope: Revise R2-2306194 in light of the conclusions of P5 of R2-2306751.

Intended outcome: Agreeable CR in R2-2306687

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][414][Relay] Handling of PC5 connection release during RRC re-establishment (Lenovo)

Scope: Discuss the proposal from R2-2305849 on handling of PC5 connection release while RRC re-establishment is ongoing and agree on a way forward.

Intended outcome: Report in R2-2306688 and agreeable CR in R2-2306689

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][415][POS] LS to RAN1/RAN3/RAN4 on LPHAP agreements (Huawei)

Scope: Draft an LS to RAN1/RAN3/RAN4:

* Ask RAN1/RAN4 for confirmation on whether the eRedCap agreed eDRX cycle lengths are sufficient for positioning;
* Indicate to RAN3 our conclusions on area-specific SRS configuration by LMF;
* Request from RAN1 the parameters for the area-specific SRS configuration.

Intended outcome: Approvable LS in R2-2306700

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][416][Relay] Rel-18 relay CR to 38.300 (LG)

Scope: Collect comments on the draft CR in R2-2305207 and produce a revision.

Intended outcome: Revised CR in R2-2306554

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][417][Relay] LS to SA2 on announcement of neighbour UEs (ZTE)

Scope: Draft an LS to SA2 indicating the agreement:

For Model A discovery, the relay UE should only announce the neighbour UEs for which the PC5 link quality between the relay UE and the neighbour UE is above a certain threshold in a discovery announcement message.

Intended outcome: Approvable LS in R2-2306697

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][418][Relay] Authorisation for U2U relay (ZTE)

Scope: Discuss the issue of authorisation for L2 and L3 U2U relay and determine if something beyond the existing ProSe authorisation is needed. Draft a reply LS to SA2.

Intended outcome: Report to CB session in R2-2306690 and approvable LS in R2-2306691

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][419][Relay] Short ID in U2U relay (Ericsson)

Scope: Discuss P16a of R2-2306555, considering issues of ID collision and future applicability to multihop, and attempt to converge on a way forward. F2F offline to be arranged Wednesday 2023-05-24 afternoon in Brk3.

Intended outcome: Report to CB session in R2-2306692

Deadline: Wednesday 2023-05-24 2000 KST

* [AT122][420][Relay] LS to SA3 on reporting of relay UE C-RNTI and NCGI (OPPO)

Scope: Draft an LS to SA3 informing them of our WA on remote UE reporting the C-RNTI and serving cell ID of RRC\_CONNECTED relay UE in scenario 2, and asking if there is any security concern.

Intended outcome: Approvable LS in R2-2306693

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][421][Relay] LS to RAN3 on mode 1 scheduling in inter-DU multi-path case (NEC)

Scope: Draft an LS to RAN3 (with “take into account” action) informing them of our agreement on mode 1 scheduling for the remote UE in scenario 1.

Intended outcome: Approvable LS in R2-2306781

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][422][POS] LS to SA2 on reporting positioning measurements taken in RRC\_IDLE (CATT)

Scope: Draft an LS to SA2 indicating that from RAN2 perspective, reporting in RRC\_CONNECTED of measurements taken in RRC\_IDLE is feasible, and asking them to check for impact to their specs.

Intended outcome: Approvable LS in R2-2306695

Deadline: Thursday 2023-05-25 2000 KST

* [AT122][423][POS] LS to SA2 on sidelink positioning agreements (Intel)

Scope: Draft an LS to SA2 informing them of this meeting’s agreements on sidelink positioning. Expected action is “take into account”.

Intended outcome: Approvable LS in R2-2306696

Deadline: Thursday 2023-05-25 2000 KST

# 4 EUTRA Rel-17 and earlier

Only essential corrections. No documents should be submitted to 4. Please submit to 4.x

## 4.4 Positioning corrections Rel-16 and earlier

(LTE\_NavIC-Core, LTE TEI16 Positioning), REL-15 and Earlier WIs related to positioning are in scope but not listed explicitly (long list).

This Agenda Item will be handled by email.

### 4.4.0 In-Principle-Agreed CRs

### 4.4.1 Corrections

# 5 NR Rel-15 and Rel-16

Essential corrections only.

Tdoc Limitation: 8 tdocs in total for all sub agenda items.

In case a correction need to be reflected in both NR TS and LTE TS, the corrections should be submitted under one single AI (so the NR and LTE correction can be treatee together), the sub-AIs below this

## 5.3 NR Positioning Support

(NR\_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; closed: Jun. 19: WID: RP-191971)

(NR\_pos-Core; leading WG: RAN1; REL-16; started: Mar 19; target; Jun 20; WID: RP-200218).

(NR TEI16 Positioning)

This agenda item will be handled by email.

### 5.3.0 In-Principle-Agreed CRs

[R2-2304789](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202305 - RAN2_122, Incheon\\Extracts\\R2-2304789 Correction on SI update for posSIB-r16.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202305 - RAN2_122, Incheon\Extracts\R2-2304789 Correction on SI update for posSIB-r16.docx) Correction on SI update for posSIB-r16 Huawei, HiSilicon CR Rel-16 38.331 16.12.0 3974 1 F NR\_pos-Core R2-2302985

* Agreed (email discussion [AT122][400])

[R2-2304790](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304790%20Correction%20on%20SI%20update%20for%20posSIB-r17.docx) Correction on SI update for posSIB-r17 Huawei, HiSilicon CR Rel-17 38.331 17.4.0 3975 1 F NR\_pos-Core, NR\_redcap-Core R2-2302986

* Agreed (email discussion [AT122][400])

[R2-2305253](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305253_36305_(0113)_R15_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-15 36.305 15.5.0 0113 1 F LCS\_LTE\_acc\_enh-Core R2-2304308

* Agreed (email discussion [AT122][400])

[R2-2305254](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305254_36305_(0114)_R16_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 36.305 16.4.0 0114 1 A LCS\_LTE\_acc\_enh-Core R2-2304309

* Agreed (email discussion [AT122][400])

[R2-2305255](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305255_36305_(0115)_R17_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 36.305 17.2.0 0115 1 A LCS\_LTE\_acc\_enh-Core R2-2304310

* Agreed (email discussion [AT122][400])

[R2-2305256](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305256_38305_(0129)_R15_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-15 38.305 15.9.0 0129 1 F NR\_newRAT-Core R2-2304311

* Agreed (email discussion [AT122][400])

[R2-2305257](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305257_38305_(0130)_R16_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 38.305 16.8.0 0130 1 A NR\_newRAT-Core R2-2304312

* Agreed (email discussion [AT122][400])

[R2-2305258](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305258_38305_(0131)_R17_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 38.305 17.4.0 0131 1 A NR\_newRAT-Core R2-2304313

* Agreed (email discussion [AT122][400])

[R2-2305259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305259_36305_(0116)_R16_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 36.305 16.4.0 0116 1 F NR\_pos-Core R2-2304314

* Agreed (email discussion [AT122][400])

[R2-2305260](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305260_36305_(0117)_R17_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 36.305 17.2.0 0117 1 A NR\_pos-Core R2-2304315

* Agreed (email discussion [AT122][400])

[R2-2305261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305261_38305_(0132)_R16_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 38.305 16.8.0 0132 1 F NR\_pos-Core R2-2304316

* Agreed (email discussion [AT122][400])

[R2-2305262](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305262_38305_(0133)_R17_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 38.305 17.4.0 0133 1 A NR\_pos-Core R2-2304317

* Agreed (email discussion [AT122][400])

### 5.3.1 General and Stage 2 corrections

Including incoming LSs if any, Including impact to 36.305 and 38.305. Stage 2 corrections shall be discussed with the specification rapporteur (Sven Fischer sfischer@qti.qualcomm.com) before submission. Stage 2 CRs not discussed with the specification rapporteur will not be treated.

### 5.3.2 RRC corrections

Including impact to 36.331, 38.331, and 38.306.

[R2-2306409](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306409%20Discussion%20on%20the%20misalignment%20issue%20in%20location%20measurement%20indication%20procedure.docx) Discussion on the misalignment issue in location measurement indication procedure ZTE Corporation discussion Rel-15 NR\_newRAT-Core

* Noted

[R2-2306459](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306459%20Clarification%20on%20the%20misalignment%20issue%20in%20location%20measurement%20indication%20procedure.docx) Clarification on the misalignment issue in location measurement indication procedure ZTE Corporation CR Rel-15 38.331 15.21.0 4149 - F NR\_newRAT-Core

* Not pursued

[R2-2306460](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306460%20Clarification%20on%20the%20misalignment%20issue%20in%20location%20measurement%20indication%20procedure.docx) Clarification on the misalignment issue in location measurement indication procedure ZTE Corporation CR Rel-16 38.331 16.12.0 4150 - A NR\_newRAT-Core

* Not pursued

[R2-2306461](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306461%20Clarification%20on%20the%20misalignment%20issue%20in%20location%20measurement%20indication%20procedure.docx) Clarification on the misalignment issue in location measurement indication procedure ZTE Corporation CR Rel-17 38.331 17.4.0 4151 - A NR\_newRAT-Core

* Not pursued

### 5.3.3 LPP corrections

[R2-2306027](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306027.docx) GNSS Troposperic Delay Correction field description Ericsson CR Rel-16 37.355 16.10.0 0451 - F NR\_pos-Core

* Revised in R2-2306836

[R2-2306836](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306836.docx) GNSS Tropospheric Delay Correction field description Ericsson CR Rel-16 37.355 16.10.0 0451 1 F NR\_pos-Core

* Agreed

[R2-2306028](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306028%20SSRgridA.docx) GNSS Troposperic Delay Correction field description Ericsson CR Rel-17 37.355 17.4.0 0452 - A NR\_pos-Core

* Revised in R2-2306837

[R2-2306837](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306837.docx) GNSS Tropospheric Delay Correction field description Ericsson CR Rel-17 37.355 17.4.0 0452 1 A NR\_pos-Core

* Agreed

### 5.3.4 MAC corrections

[R2-2306084](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306084%20Correction%20on%20DL%20MAC%20CE%20for%20SP%20Positioning%20SRS.docx) Correction on DL MAC CE for SP Positioning SRS ZTE Corporation CR Rel-16 38.321 16.11.0 1590 1 F NR\_pos-Core R2-2303501

* Not pursued

[R2-2306085](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306085%20Correction%20on%20DL%20MAC%20CE%20for%20SP%20Positioning%20SRS.docx) Correction on DL MAC CE for SP Positioning SRS ZTE Corporation CR Rel-17 38.321 17.4.0 1591 1 A NR\_pos-Core R2-2303502

* Not pursued
* [AT122][407][POS] Rel-15/16 positioning CR check (Intel)

Scope: Check the CRs in R2-2306459 / R2-2306460 / R2-2306451 (in light of the exposition in R2-2306409), R2-2306027 / R2-2306028, and R2-2306084 / R2-2306085.

Intended outcome: Agreeable CRs, and report in R2-2306699

Deadline: Thursday 2023-05-25 1100 KST

[R2-2306699](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306699%20%20%5bAT122%5d%5b407%5d%5bPOS%5d%20Rel-1516%20positioning%20CR%20check%20(Intel)-v14-Summary2.docx) [AT122][407][POS] Rel-15/16 positioning CR check (Intel) Intel Corporation discussion

* Noted

Proposal 1: CRs R2-2306459 / R2-2306460 / R2-2306451 are not pursued.

Proposal 2: CRs R2-2306027 / R2-2306028 are agreed with modifications on the coversheet;

Proposal 3: CRs R2-2306084 / R2-2306085 are not pursued.

Discussion:

Intel clarify that some additional comments were received on P1 regarding when the UE is allowed to send the request for which frequency.

ZTE understand that it is important to have clear guidance on how the UE can perform the frequency request. They wonder if something can be captured in chair notes.

Qualcomm think there either is or is not something wrong in the spec, and they note that the procedure is also used for E-UTRA SFN decoding; they are not sure what the problem is.

ZTE do not intend to change behaviour; they intend to capture what the UE behaviour is intended to be.

Xiaomi understand that the request is up to UE implementation and this should not impact the spec.

Ericsson think the stage 3 allows the UE to request a frequency that it has not previously requested, so they do not see the need for an agreement. Intel have the same understanding.

ZTE agree we should not clarify everything in the notes, but they see this as different because it implies product behaviour. They see an alternative interpretation in which the UE may request the frequencies that it already requested before.

Intel interpret that ZTE intend to clarify that the UE is not allowed to re-request already requested frequencies, but this is not quite what the proposed wording says. They also do not see a problem since the network implementation can handle the request as it likes.

ZTE wonder if anyone has a different understanding from the proposed wording.

CATT understand that from network perspective, the network can provide any MG based on the latest request from the UE; according to NOTE 1, the UE’s behaviour is constrained and it cannot re-request if the network does not configure the gap. So they see that the network will only provide the MG based on the latest request.

Intel think we left freedom for the network implementation in what gaps to provide.

vivo think the UE behaviour for gap request is similar to the PRS measurement configuration, which does not support delta configuration. So they agree with CATT that the network implementation may consider the request as new each time.

# 6 NR Rel-17

## 6.3 NR Sidelink relay

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

Tdoc Limitation: 2 tdocs

### 6.3.0 In principle agreed CRs

[R2-2306196](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38323_CR0123r1_(Rel-17)_R2-2306196%20Clarification%20on%20the%20services%20expected%20from%20SRAP%20layer.docx) Clarification on the services expected from SRAP layer Huawei, HiSilicon CR Rel-17 38.323 17.4.0 0123 1 F NR\_SL\_relay-Core R2-2303490

* Agreed

[R2-2306197](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38322_CR0052r1_(Rel-17)_R2-2306197%20Clarification%20on%20the%20maximum%20Data%20field%20size%20for%20L2%20U2N%20relay.docx) Clarification on the maximum Data field size for L2 U2N relay Huawei, HiSilicon CR Rel-17 38.322 17.2.0 0052 1 F NR\_SL\_relay-Core R2-2303491

* Agreed

[R2-2306198](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38304_CR0333r3_(Rel-17)_R2-2306198%20Clarification%20on%20sidelink%20communication%20resource%20configuration%20used%20by%20OoC%20L2%20Remote%20UE.docx) Clarification on sidelink communication resource configuration used by OoC L2 Remote UE Huawei, HiSilicon CR Rel-17 38.304 17.4.0 0333 3 F NR\_SL\_relay-Core R2-2304508

* Agreed

Discussion:

Nokia are concerned about collision with the CR from discussion [AT122][504]. Huawei think this can be addressed as long as relay experts participate in the discussion.

[R2-2306199](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38331_CR4064r1_(Rel-17)_R2-2306199%20Miscellaneous%20corrections%20for%20SL%20relay.docx) Miscellaneous corrections for SL relay Huawei, HiSilicon, CATT, ZTE Corporation, Sanechips, vivo, Apple, Nokia, Nokia Shanghai Bell, Philips International B.V. CR Rel-17 38.331 17.4.0 4064 1 F NR\_SL\_relay-Core R2-2304466

* Agreed

### 6.3.1 Control plane and Stage-2 corrections

A single CR with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur. Larger open issues can be discussed with contributions (limited time).

Agenda item summary

[R2-2306751](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306751%20%5bPre122%5d%5b406%5d%5bRelay%5d%20Summary%20of%20AI%206.3.1%20on%20Rel-17%20relay%20control%20plane%20(Huawei).docx) [Pre122][406][Relay] Summary of AI 6.3.1 on Rel-17 relay control plane (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

38.300 corrections

Proposal 1: The following changes are agreeable and can be merged into one mega CR for small stage 2 changes, and R2-2305058 can be taken as baseline for the mega CR.

‐ In subclause 16.12.6.2, for direct to indirect path switch, clarify that RRCReconfiguration message sent to UE happens during step 5, not between step 4 and step 5.(R2-2305274)

‐ In subclause 16.12.6.1, remove “can release PC5-RRC connection and” from the sentence that “Either L2 U2N Relay UE or L2 U2N Remote UE's AS layer can release PC5-RRC connection and indicates upper layers to release PC5 unicast link after receiving the RRCReconfiguration message from the gNB.”(R2-2305275)

‐ Added SL-RSRP as an abbreviation to compliment the definition of SD-RSRP and described the intention of the discovery RSRP and communication RSRP. (R2-2305587)

‐ Replaced the “enable DL bearer mapping between ingress RLC channel and egress RLC channel” with “identify the corresponding end-to-end Uu Radio Bearer(s) of L2 U2N remote UE” (R2-2305058)

‐ Add “L3” in 16.12.3 to restrict preconfiguration to only be used by L3 U2N relay UE for relay discovery transmission. (R2-2305058)

‐ Fixed a list of editorial issues mentioned in the reasons of change. (R2-2305058)

Discussion:

Nokia wonder if the second bullet is correct; they understand that the UEs can release the connection. Huawei clarify that it is to align with the usage in the RRC specification, where we say that AS will notify upper layers to trigger the release. Nokia think nothing is wrong with the existing sentence.

Huawei indicate it could suggest that AS layer releases the connection, which is wrong.

* P1 is agreed (document statuses to be updated)

38.331 corrections

Proposal 2: Regarding correction on remote UE’s behavior upon SIB1 reception, RAN2 to discuss the 3 options:

– Option 1: change procedural text as in R2-2305215;

– Option 2: add a note as the 1st change in R2-2306194;

– Option 3: no change, which means the remote UE can camp on a relay UE only when it can camp on the Uu Cell with respect to Uu bandwidth, frequency, etc.

Discussion:

Xiaomi think the current spec is not correct; the remote UE should not check the Uu PHY conditions, so either option 1 or option 2 would be correct; they slightly prefer option 1.

OPPO do not think option 1 is essential. They can accept option 2, but they are not sure if it’s correct that the UE does not have to apply this configuration. They would be fine with option 3.

ZTE agree with the intention that the UE does not apply this configuration, but they think a NOTE is OK.

Nokia agree with the intention of the change, but since this is a normative UE behaviour, they think a NOTE is not sufficient; however, they think the change in option 1 is not fully correct.

LG think option 1 or option 2 is needed, but option 2 is preferred.

Qualcomm think there are other places in the spec with similar issues, and a NOTE could be sufficient.

Huawei want to clarify the scenario; the remote UE is OOC but could not camp on the cell if in coverage, so the use case for the proposal is to allow the UE to act as a remote UE when OOC. They are fine with option 3, which would mean no OOC-only operation of a remote UE when it could not otherwise camp on the cell. They think the UE should check to know if it can be served directly by the cell; if the UE cannot be served by the cell, it could prefer another relay UE on a different cell.

Xiaomi think if the UE moves back to an in-coverage cell, the current conditions will apply and nothing is broken. They also think the gNB can be aware of the UE’s capability and do the correct handling. Huawei think the condition is not useful if it is up to UE implementation whether to apply it.

Apple think the wording of the proposed NOTE is not perfect. Nokia think the NOTE uses normative words that are forbidden in NOTEs, and we should change the procedural text.

OPPO are not convinced that there is a real problem; the UE just performs an additional check. They understand that we guide the UE to perform direct path search and relay selection in parallel, dependent on implementation, so the UE should be able to camp on each type of path; they thus want to avoid a normative change, but they could discuss the wording of a NOTE.

Xiaomi think there is no requirement that the UE has to support Uu on a cell to use relaying to the cell; e.g., wearables might not support the cell configuration on the direct path. So they think it is not a corner case.

Nokia agree a NOTE would be simpler, but we should not use one to modify normative behaviour. The intention is that the normative behaviour is the same with or without the NOTE.

Qualcomm think there are a lot of Uu features not supported for U2N, and they wonder if we need to clarify everything or just capture a high-level sentence somewhere.

OPPO think there are two perceptions: Companies believe the change is needed, i.e., the UE behaviour needs to be changed, or else that the UE behaviour is already allowed and at most a clarifying NOTE would be needed.

Samsung agree with Qualcomm that there are other places in the spec needing clarification, which is not easy to do at this stage. So they would prefer a NOTE for this case.

* [AT122][411][Relay] NOTE on remote UE reception of SIB1 (Huawei)

Scope: Attempt to draft a NOTE capturing the intention of the 1st change in R2-2306194, without changing the normative UE behaviour. If it is concluded that normative impact is needed, the issue can be postponed.

Intended outcome: Report in R2-2306683 and agreeable CR in R2-2306684 (to Friday CB session)

Deadline: Thursday 2023-05-25 2000 KST

Proposal 3: RAN2 to agree that UE is not allowed to perform discovery transmission when the received SIB12 indicates discovery is not supported. The CR in R2-2305573 is taken as baseline, and can be revised to include discovery monitoring case based on further discussion.

Discussion:

vivo think the CR only changes section 5.2, and there are other CRs changing 5.8 on the discovery procedure. Huawei understand that the discovery procedure will not act without a resource pool.

Huawei think there should be a similar change to discovery monitoring; otherwise it may be misleading.

OPPO agree with Huawei about monitoring; monitoring in a cell with no discovery is useless.

Nokia indicate they deliberately left section 5.8 out of the CR since they understand it is covered by 5.2, but they are OK to make a change there as well.

Samsung think the SIB procedure already covers the discovery procedure, and we may not need a change to section 5.8; they also think we need similar text for the monitoring procedure.

Xiaomi understand the intention is only for relay discovery, not non-relay discovery, so the CR may need some refinement. Huawei understand the CR intends to cover all discovery, because the indication in SIB12 applies to relay and non-relay.

Xiaomi think non-relay discovery should be performed even when SIB12 does not support it.

OPPO agree with Huawei that there is no need to differentiate between relay and non-relay; they understand that the network should coordinate at cell/coverage boundaries, so no need to differentiate IC vs. OOC either.

Qualcomm wonder for non-relay discovery, if the UE is IC but the cell does not support it, can the UE use preconfiguration? Huawei indicate that if the UE is IC it follows the SIB12 configuration, and in this case, if SIB12 does not indicate support of non-relay discovery, the UE should not perform it.

* [AT122][412][Relay] CR on discovery setting in SIB12 (Nokia)

Scope: Revise the CR in R2-2305573, adding a condition for discovery monitoring. Can discuss if something is needed in section 5.8 in addition to the existing change in 5.2.

Intended outcome: Agreeable CR in R2-2306685

Deadline: Thursday 2023-05-25 2000 KST

Proposal 4: Regarding handling of relay UE’s reconfiguration failure and integrity check failure, RAN2 to discuss the 3 options:

– Option 1: capture in spec that cell selection can trigger relay UE to send notification message with indication type set to relayUE-CellReselection, as proposed in R2-2305244;

– Option 2: capture in spec that relay UE releases the PC5 unicast link upon reconfiguration failure and integrity check failure, as proposed in R2-2306194;

– Option 3: no change, which means relay UE’s reconfiguration failure and integrity check failure are considered as corner cases and are left to UE implementation.

Discussion:

LG support option 3; for option 1, they think relay selection can occur with any RRC state, and for option 2, they think this can be handled by gNB implementation based on receiving a failure message from the relay UE. They also think integrity check failure should be a rare case.

ZTE wonder if we need to specify all failure cases; they think corner cases should be left to relay UE implementation, and here the relay UE can release the PC5 link.

Apple have the same view as LG and think option 3 is the best way forward. They think option 2 is too dramatic.

Xiaomi can accept no spec change, but they would prefer not to capture it as a “corner case” as such.

Agreement:

Relay UE’s reconfiguration failure and integrity check failure are left to UE implementation.

Proposal 5: The following editorial/small changes are agreeable, and can be merged into a rapporteur CR revised from R2-2306194:

– In sub-clause 5.8.3.2, the term “in case L2 U2N relay operation” is modified as “in case of L2 U2N relay operation”.( R2-2306115)

– In clause 5.5.5.1, replace maxReportCells with maxNrofRelayMeas (R2-2306194)

– In clause 6.3.5, remove “, e.g. SRAP-Config” from the IE description of SL-L2RemoteUE-Config. (R2-2306194)

– Remove the L3 Remote UE and L3 Relay UE from the field description of sl-DestinationIdentityL2U2N. (R2-2305059)

– in 5.8.3.2, correct the “non-relay discovery RX” case for SUI initiation (R2-2305060)

– in 5.8.3.2, add a new if condition of “3> if configured by upper layers not to transmit either NR sidelink L2 U2N relay communication or NR sidelink L3 U2N relay communication, and if the last transmission of the SidelinkUEInformationNR message includes both sl-TxResourceReqL2U2N-Relay and sl-TxResourceReqL3U2N-Relay.” for initiation of SUI transmission for relay communication (R2-2305060)

– In 5.3.7.2, add “1> stop timer T301, if running” as suggested by Lenovo if R2-2305849 is not pursued.

Discussion:

OPPO think we could restart the timer in the last bullet. Huawei clarify that the added UE behaviour is for the case that the remote UE triggers RRC re-establishment while the timer is running, and the current spec could result in triggering re-establishment again. But they have a similar understanding to OPPO that it is similar to restarting the timer.

Lenovo think according to the current spec, a UE that starts re-establishment while T301 is running will first perform cell selection, so the UE needs to stop T311 after selecting a suitable cell or relay, then start T301. So they think it is not suitable just to restart T301.

Xiaomi understand the remote UE will receive a release from the relay UE, and this is a corner case. Lenovo think it is not really a corner case, and we have a similar case when a remote UE receives a notification or release message already captured in the spec.

ZTE wonder if stopping T301 will also require updating the stop condition in section 7.1.

Huawei intended the last bullet to be conditional on R2-2305849 being not pursued, and stopping T301 is an alternative change to address the same issue.

Xiaomi think if we stop T301, the re-establishment is still ongoing, and there is no way to know if it completes successfully. They also think the current spec causes the UE to start T301 when the new re-establishment starts.

Lenovo indicate when the remote UE receives a notification message while T301 is running, in the current spec it goes to idle directly. Their proposal was intended to align the current spec behaviour.

Huawei think the last bullet could be left out of the conclusion and we go on to P6 for Lenovo’s proposal.

* P5 is agreed without the last bullet
* [AT122][413][Relay] Relay miscellaneous CR to 38.331 (Huawei)

Scope: Revise R2-2306194 in light of the conclusions of P5 of R2-2306751.

Intended outcome: Agreeable CR in R2-2306687

Deadline: Thursday 2023-05-25 2000 KST

Proposal 6: The following changes are not necessary, so not pursued:

– In 5.3.7.2, the condition of ‘T301 is not running’ is added to ‘upon PC5 unicast link release indicated by upper layer at L2 U2N Remote UE in RRC\_CONNECTED. In 5.3.7.7, the condition of ‘upon PC5 unicast link release indicated by upper layer at L2 U2N Remote UE’ is added. (R2-2305849)

– In sub-clause 5.8.9.3, the term “the UE is acting as L2 U2N Remote UE” is modified as “the UE was acting as L2 U2N Remote UE”.(R2-2306115)

Discussion:

Lenovo and Huawei think we could go offline for the first bullet.

* Second bullet is agreed, i.e., R2-2306115 is not pursued
* [AT122][414][Relay] Handling of PC5 connection release during RRC re-establishment (Lenovo)

Scope: Discuss the proposal from R2-2305849 on handling of PC5 connection release while RRC re-establishment is ongoing and agree on a way forward.

Intended outcome: Report in R2-2306688 and agreeable CR in R2-2306689

Deadline: Thursday 2023-05-25 2000 KST

38.304 corrections

Proposal 7: The changes in R2-2305212 are agreeable, and can be merged into the CR revised from R2-2306198.

Discussion:

Apple think the change in section 8.1 was discussed in the sidelink enhancements session and additional changes have been proposed. Huawei understand that this is related to the IPA CR rather than the new changes; their understanding is that colliding changes were agreed in the sidelink session.

Apple indicate that there is a CR from ZTE that was requested to be handled in the relay session.

ZTE indicate that their CR is addressed to sidelink discovery, and they think it should be discussed here.

Nokia checked the sidelink CR and they understand it is a superset of the proposals here. They think the easiest thing would be to ask the rapporteur of that CR/email discussion to consider these topics as well.

Apple indicate the colliding document is R2-2304940, which is on email discussion.

vivo understand relay-interested delegates are already invited to follow the email discussion.

Nokia think R2-2304940 covers all the changes from R2-2305212.

R2-2306683 (Report of [411]) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

R2-2306684 (CR from [411]) Huawei, HiSilicon CR Rel-17 38.331 17.4.0 xxxx - F NR\_SL\_relay-Core

R2-2306685 On sidelink discovery transmission upon reception of SIB12 Nokia, Nokia Shanghai Bell CR Rel-17 38.331 17.4.0 4113 1 F NR\_SL\_relay-Core

R2-2306687 RRC corrections for SL Relay Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4140 1 F NR\_SL\_relay-Core

R2-2306688 (Report of [414]) Lenovo discussion Rel-17 NR\_SL\_relay-Core

R2-2306689 (CR from [414]) Lenovo CR Rel-17 38.331 17.4.0 xxxx - F NR\_SL\_relay-Core

The following documents will not be individually treated

[R2-2305058](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305058%2038300_Correction_for_NR_sidelink_relay_v1.docx) Miscellaneous corrections for Stage 2 NR sidelink relay Apple CR Rel-17 38.300 17.4.0 0656 1 F NR\_SL\_relay-Core R2-2303384

* Agreed as R2-2306682, with modifications in line with P1 from R2-2306751

[R2-2305059](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305059%2038331_Correction_FD_SL_Relay.docx) Correction on field description of sl-DestinationIdentityL2U2N Apple CR Rel-17 38.331 17.4.0 4086 - F NR\_SL\_relay-Core

* Merged into R2-2306687

[R2-2305060](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305060%2038331_Correction_SUI_relay.docx) Corrections on triggering conditons of SUI message for SL relay Apple CR Rel-17 38.331 17.4.0 4087 - F NR\_SL\_relay-Core

* Merged into R2-2306687

[R2-2305212](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305212%20Clarification%20on%20sidelink%20discovery.docx) Clarification on sidelink discovery ZTE, Sanechips CR Rel-17 38.304 17.4.0 0342 - F NR\_SL\_relay-Core

* Handled exceptionally in email discussion [AT122][504] (pending confirmation from email discussion rapporteur and sidelink chair)

[R2-2305215](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305215.docx) Correction on remote UE’s behavior upon SIB1 reception Xiaomi CR Rel-17 38.331 17.4.0 4092 - F NR\_SL\_relay-Core

[R2-2305243](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305243_UE%20behavior%20when%20the%20NW%20indicates%20not%20supporting%20discovery.docx) UE behavior when the NW indicates not supporting discovery vivo CR Rel-17 38.331 17.4.0 4093 - F NR\_SL\_relay-Core

[R2-2305244](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305244_Correction%20on%20%20L2%20U2N%20Relay%20UE%20behavior%20upon%20upon%20cell%20selection.docx) Correction on L2 U2N Relay UE behavior upon cell selection vivo CR Rel-17 38.331 17.4.0 4094 - F NR\_SL\_relay-Core

[R2-2305274](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38300_CR0674_(Rel-17)_R2-2305274-Correction%20on%20direct%20to%20indirect%20path%20switching.docx) Correction on direct to indirect path switching CATT CR Rel-17 38.300 17.4.0 0674 - F NR\_SL\_relay-Core

* Merged into R2-2306682

[R2-2305275](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38300_CR0675_(Rel-17)_R2-2305275-Correction%20on%20the%20PC5%20unicast%20link%20release%20in%20case%20of%20indirect%20to%20direct%20path%20switching.docx) Correction on the PC5 unicast link release in case of indirect to direct path switching CATT CR Rel-17 38.300 17.4.0 0675 - F NR\_SL\_relay-Core

* Merged into R2-2306682

[R2-2305573](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305573%2038331%20Sidelink%20discovery%20transmission%20upon%20reception%20of%20SIB12.docx) On sidelink discovery transmission upon reception of SIB12 Nokia, Nokia Shanghai Bell CR Rel-17 38.331 17.4.0 4113 - F NR\_SL\_relay-Core

* Revised in R2-2306685 (email discussion [AT122][412])

[R2-2305587](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305587%2038300%20Differentiation%20of%20SL%20and%20SD%20RSRP.docx) Differentiation of SD-RSRP and SL-RSRP Nokia, Nokia Shanghai Bell CR Rel-17 38.300 17.4.0 0679 - F NR\_SL\_relay-Core

* Merged into R2-2306682

[R2-2305846](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305846%20Reception%20of%20PC5%20release%20message%20during%20re-establishment%20v1.0.docx) Reception of PC5 release message during re-establishment Lenovo discussion Rel-17 38.331 NR\_SL\_relay-Core

[R2-2305849](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305849-%20CR4118%20Correction%20for%20release%20message%20with%20re-establishment%20v1.0.docx) Correction for release message with re-establishment Lenovo CR Rel-17 38.331 17.4.0 4118 - F NR\_SL\_relay-Core

[R2-2306115](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306115_Corrections%20on%20L2%20U2N%20Relay.docx) Corrections on L2 U2N Relay ASUSTeK CR Rel-17 38.331 17.4.0 4135 - F NR\_SL\_relay-Core

* Not pursued

[R2-2306131](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Docs\R2-2306131.zip) Correction on Sidelink Relay discovery procedure Philips International B.V. CR Rel-17 38.331 17.4.0 4137 - F NR\_SL\_relay-Core

[R2-2306194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38331_CR4140_(Rel-17)_R2-2306194%20RRC%20corrections%20for%20SL%20Relay.docx) RRC corrections for SL Relay Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4140 - F NR\_SL\_relay-Core

* Revised in R2-2306687 in line with the outcome of P5 from R2-2306751 (email discussion [AT122][413])

[R2-2306498](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306498%20-%2038.331_CR4155_Rel17_Correction%20on%20Sidelink%20Discovery%20Transmissions.docx) Correction on Sidelink Discovery Transmissions Ericsson España S.A. CR Rel-17 38.331 17.4.0 4155 - F NR\_SL\_relay-Core

### 6.3.2 User plane corrections

A single CR with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur for the corresponding spec. Larger open issues can be discussed with contributions (limited time).

[R2-2305211](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305211%20Corrections%20on%20SRAP%20for%20SL%20relay.docx) Corrections on SRAP for SL relay ZTE Corporation, Sanechips CR Rel-17 38.351 17.4.0 0021 - F NR\_SL\_relay-Core

Discussion:

ZTE indicate some comments on the logic were received.

Samsung think the first change should not have the “i.e.” parenthetical.

Huawei think the original wording in the first part is correct, because the case that SL-RLC1 is not configured is already covered. They are fine with the second change. Ericsson agree.

ZTE think there is a case where there is an SRB entry without the RLC channel.

Samsung think we can discuss offline.

* [AT122][410][Relay] SRAP corrections (ZTE)

Scope: Check the intention of the first change and the details of wording for the CR in R2-2305211.

Intended outcome: Agreeable CR in R2-2306679 and report in R2-2306698

Deadline: Wednesday 2023-05-24 2000 KST

[R2-2306698](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306698_Summary%20of%20%5bAT122%5d%5b410%5d%5bRelay%5d%20SRAP%20corrections%20(ZTE).doc) Report of [AT122][410][Relay] SRAP corrections (ZTE) ZTE Corporation, Sanechips discussion Rel-17 NR\_SL\_relay-Core

* Noted

[R2-2306679](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38351_CR0021_(Rel-17)_R2-2306679_%20Corrections%20on%20SRAP%20for%20SL%20relay.docx) Corrections on SRAP for SL relay ZTE Corporation, Sanechips CR Rel-17 38.351 17.4.0 0021 1 F NR\_SL\_relay-Core

* Agreed

[R2-2305589](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305589%20Corrections%20on%20SRAP%20for%20SL%20relay.docx) Corrections on SRAP for SL relay NEC, Apple, Samsung, ZTE CR Rel-17 38.351 17.4.0 0020 2 F NR\_SL\_relay-Core R2-2304480

* Agreed

Discussion:

Samsung clarify that this should have been in the list of AIP CRs (R2-2304480 from last meeting).

[R2-2306195](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\38351_CR0022_(Rel-17)_R2-2306195%20Clarification%20on%20the%20SRAP%20configuration%20used%20in%20SRAP.docx) Clarification on the SRAP configuration used in SRAP Huawei, HiSilicon CR Rel-17 38.351 17.4.0 0022 - F NR\_SL\_relay-Core

* Agreed as R2-2306680, without the first change

Discussion:

OPPO think the first change is not needed and the NOTE is in line with how we normally operate; the need codes should prevent misunderstanding of the configuration. For the second change, they prefer the original wording.

Samsung think the understanding of the first change is correct but does not need to be clarified.

Apple think the first change is not necessary as indicated by OPPO and Samsung. For the second change they have no strong view.

NEC have the same understanding as OPPO; for the first change, the intention of the CR is aligned with the current understanding. They are fine with the second set of change.

Huawei think we could take an agreement in the notes to clarify the understanding.

Ericsson want to clarify that this is similar to legacy behaviour, and they wonder why we capture it explicitly. Huawei think this behaviour is not captured explicitly in RRC.

Samsung agree that the spec does not call out the behaviour explicitly with a field name.

Ericsson understood from Samsung’s comment that it is not legacy behaviour.

Samsung think we have just referred to the routing configuration table in the past, and here we refer to the specific RRC field name; they understand that Huawei’s interpretation is correct, but they are not sure if it is correctly described as “legacy” behaviour.

Ericsson think the need code should already capture the behaviour.

Huawei agree with the comments that RRC configurations will follow the need code, and a reasonable UE implementation would assume the whole configuration should be used.

Apple wonder why it applies only to the relay UE. Huawei agree it should cover both.

Agreements:

The proposed NOTE in section 4.5 (first change in the CR) is not added.

RAN2 understand that the configuration of SRAP entity for the U2N relay or remote UE is derived from the whole configuration applied by the UE, but not the latest received configuration via RRC message, e.g. for matching an entry in a received RRC field. No specification impact is expected.

Changes after the first change in the CR are agreed.

## 6.5 NR positioning enhancements

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

Tdoc Limitation: 2 tdocs

### 6.5.0 In principle agreed CRs

[R2-2304792](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304792%20Correction%20to%20UEPositioningAssistanceInformation.docx) Correction to UEPositioningAssistanceInformation Huawei, HiSilicon CR Rel-17 38.305 17.4.0 0124 2 F NR\_pos\_enh-Core R2-2304540

* Agreed

[R2-2304884](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304884%20CR%20to%2038305%20Measurements%20TRP%20AD.docx) Measurements and Assistance Data Transfer Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0126 2 F NR\_pos\_enh-Core R2-2304494

* Agreed

[R2-2304885](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304885%20CR%20to%2038305%20Integrity.docx) Protection Level and Target Integrity Risk Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0127 2 F NR\_pos\_enh-Core R2-2304495

* Agreed

[R2-2304886](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304886%20CR%20to%2037355%20LOS-NLOS%20Indicator_v02.docx) LOS-NLOS-Indicator Types Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-17 37.355 17.4.0 0442 2 F NR\_pos\_enh-Core R2-2304496

* Agreed

[R2-2305131](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305131%20Misc%20LPP%20corrections%20R17%2037355.docx) Miscellaneous corrections on LPP Lenovo CR Rel-17 37.355 17.4.0 0432 1 F NR\_pos\_enh-Core R2-2302884

* Agreed

[R2-2305289](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305289_37355r2_CR0431_(Rel-17).docx) Corrections on applicability of timing error margin of RxTEG in NR-Multi-RTT-SignalMeasurementInformation field descriptions and other Miscellaneous corrections CATT CR Rel-17 37.355 17.4.0 0431 2 F NR\_pos\_enh-Core R2-2304520

* Agreed

[R2-2305290](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305290_38331r2_CR3956_(Rel-17).docx) Corrections on the figure of UE Positioning Assistance Information procedure CATT CR Rel-17 38.331 17.4.0 3956 2 F NR\_pos\_enh-Core R2-2304281

* Agreed

[R2-2305291](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305291_38305r2_CR0123_(Rel-17).docx) Miscellaneous corrections on 38.305 CATT CR Rel-17 38.305 17.4.0 0123 2 F NR\_pos\_enh-Core R2-2304516

* Agreed

[R2-2305444](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305444.docx) Stage 2 procedure for deactivation of MG gap and PPW Intel Corporation CR Rel-17 38.305 17.4.0 0135 1 F NR\_pos\_enh-Core R2-2304463

* Agreed

[R2-2305445](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305445.docx) LPP capability for FGs27-13a,14a and 14-2 Intel Corporation CR Rel-17 37.355 17.4.0 0445 1 F NR\_pos\_enh-Core R2-2304462

* Agreed

[R2-2306018](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306018%20AIP.docx) Update of information transfer from gNB to LMF Ericsson CR Rel-17 38.305 17.4.0 0125 2 F NR\_pos\_enh-Core R2-2304457

* Agreed

Discussion:

No comments, all AIP CRs are agreed.

### 6.5.1 Corrections

A single CR per TS (Stage-2, RRC, LPP, MAC, UEcap 306) with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur. Larger open issues can be discussed with contributions (limited time).

Incoming LS and draft reply

[R2-2304608](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304608_C4-230655.docx) LS on GNSS integrity requirement parameters definition (C4-230655; contact: Huawei) CT4 LS in Rel-17 5G\_eLCS\_ph2 To:RAN2 Cc:SA2

[R2-2304804](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304804%20Reply%20to%20CT4%20on%20GNSS%20integrity%20requirements.docx) Reply to CT4 on GNSS integrity requirements Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

Discussion:

Qualcomm agree with the document that the use cases are our only guideline for the TTA, but they think the reasoning should be the same for the AL, since it is based on an application requirement, while the PL is based on a system calculation and can exceed the AL.

Nokia think on P1 (about the AL), the AL can be greater than the PL. As a way forward, they think RAN2 can recommend value ranges, but we should not introduce new signalling support in LPP.

Ericsson are generally supportive and think the TR is a suitable reference. They understand we just need to provide a sufficient range and should not discuss the details too much.

vivo are fine with P2 but think AL<PL is important to support.

CATT think we discussed the range of AL before, and the understanding was that it was essentially unbounded, but they think Huawei’s proposed range is OK.

Huawei agree AL can be larger or smaller than PL, but they think the range should be the same to allow comparing them. They clarify that they do not intend to change the PL range in LPP.

Intel think the term “define” is confusing and sounds like spec impact to us.

Huawei think we could have future spec impact if we support mode 2 reporting, and we could take these ranges as a guideline in case that happens.

Nokia think as long as the LMF has the AL and TTA, it is still within LMF implementation to calculate if there is an integrity event.

Qualcomm think we do not need TTA for mode 2, but we should focus on replying to CT4. Intel agree with Qualcomm.

Agreements:

Indicate to CT4 the range of horizontal and vertical alert limit same as the the horizontal and vertical protection level in TS 37.355, with the range to be from 0.01 meter to 500 meters, with 0.01 meters granularity

Indicate to CT4 the range of TTA based on the use cases listed in TR 38.857 as from 0.1s to 30s, with 0.1s granularity

No stage 3 impact to RAN2 specs is expected.

* [AT122][408][POS] Reply LS to CT4 on integrity parameters (Huawei)

Scope: Draft a reply to R2-2304608 in line with the agreements reached online.

Intended outcome: Approvable LS in R2-2306681

Deadline: Wednesday 2023-05-24 2000 KST

[R2-2306681](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306681%20Reply%20to%20CT4%20on%20GNSS%20integrity%20requirements.docx) Reply LS on GNSS integrity parameters RAN2 LS out Rel-17 To:CT4

* Approved

Agenda item summary

[R2-2306756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306756%20%5bPre122%5d%5b407%5d%5bPOS%5d%20Summary%20of%20AI%206.5.1%20on%20Rel-17%20positioning%20(CATT).docx) [Pre122][407][POS] Summary of AI 6.5.1 on Rel-17 positioning CATT discussion Rel-17 NR\_pos\_enh-Core

[Chair’s note: Changemarks are not included in the proposals below—see the contribution for marked-up versions.]

LPP CR:

Proposal 1: The CR in

R2-2305895 Miscelaneous LPP Corrections Qualcomm Incorporated (Rapporteur) CR Rel-17 37.355 17.4.0 0448 - F NR\_pos\_enh-Core

is essential correction. Update the Cover Sheet: The index of Editorial errors remain in Consequences if not approved should be (3).

Discussion:

Nokia think in nr-Multi-RTT-AdditionalMeasurements, “should not be present” is the wrong phrase. To be changed to “shall be absent”.

Proposal 2-1: The 1st change in CR

R2-2306025 Miscellaneous corrections and additions Ericsson, Fraunhofer IIS, Fraunhofer HHI CR Rel-17 37.355 17.4.0 0449 - F NR\_pos\_enh-Core

can be merged into rapporteur CR (LPP):

– AreaID-CellList

The IE AreaID-CellList provides the NR Cell-IDs of the TRPs belonging to a particular network area where the associated assistance data are valid. Each cell is included in only one area.

Discussion:

CATT indicate that the words “each cell is included in only one area” should be “each cell is included in only one AreaID-CellList”. Intel think in that case we should say “each Cell-ID”.

To be merged into the revision of R2-2305895.

Agreement:.

The 1st change in CR

R2-2306025 Miscellaneous corrections and additions Ericsson, Fraunhofer IIS, Fraunhofer HHI CR Rel-17 37.355 17.4.0 0449 - F NR\_pos\_enh-Core

can be merged into rapporteur CR (LPP).

Proposal 2-2: The 2nd changes in CR

R2-2306025 Miscellaneous corrections and additions Ericsson, Fraunhofer IIS, Fraunhofer HHI CR Rel-17 37.355 17.4.0 0449 - F NR\_pos\_enh-Core

are not essential.

Discussion:

Ericsson think it would be good to describe the fields, and they thought it was good to have, but they are open to hear other company views.

Intel think we already agreed one field description to merge into the rapporteur CR and this one is not a problem.

CATT think the subset shows the relation of the resource IDs, so they think it is incorrect to delete the subset description, and the proposed descriptions are also not correct as explained in the summary. So a different change would be necessary.

Qualcomm agree with CATT and think the existing description is correct.

* Change 2 is not pursued

Proposal 3: RAN2 to discuss if this CR

R2-2306026 Missing finer periodicities than 1s Ericsson CR Rel-17 37.355 17.4.0 0450 - F NR\_pos\_enh-Core

is essential correction or can be postponed waiting for the ReportingInterval updated as ms in CT4.

Discussion:

Huawei agree with the observation from the rapporteur that it should be discussed in CT4 first, because the values are only meaningful if the service layer supports them.

Qualcomm think from our pov this is not related to the CT4 spec; there was CN support for periodic reporting in UMTS, but not in LTE or NR. So they understand that this is only an LPP value. They think there are use cases for periodic reporting (e.g., integrity). However, they agree that it is not a correction as such.

Ericsson think it is still a correction to align between NRPPa and LPP, and CT4 are adding a requirement for frequent periodic reporting.

Huawei understand from SA2 side that Ericsson are correct; the service layer can request reporting with periodicities in ms, and LPP can only support to 1 s. They think the requirement should come from CT4.

CATT understand CT4 are discussing it, and they suggest we postpone the CR and wait for a conclusion there.

* Postponed

Proposal 4-1: The 1st change as below in CR

R2-2306259 NR-TRP-LocationInfo for UE-based DL-TDOA and DL-AoD positioning Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.4.0 0454 - F NR\_pos\_enh-Core,

is essential correction.

nr-TRP-LocationInfo

This field provides the location coordinates of the TRPs and location coordinates of antenna reference points for DL-PRS Resource Set(s) and DL-PRS Resources of the TRPs.

– NR-TRP-LocationInfo

The IE NR-TRP-LocationInfo is used by the location server to provide the coordinates of TRPs and coordinates of the antenna reference points for a set of TRPs. For each TRP, the ARP location can be provided for each associated PRS Resource ID per PRS Resource Set.

Discussion:

Intel wonder if it should be “TRP location or ARP location”. Nokia think the two concepts are distinguished; there is a notion of TRP location, as well as ARP location within the TRP. They indicate that the ASN.1 has the fields separately.

CATT think the correction is correct.

Qualcomm think this is correct but editorial; if we provide just one coordinate it is TRP location, and an additional coordinate refers to the ARP location. They see it as aligning the introductory text with the ASN.1 structure and think it could be merged.

Nokia are OK with merging, and they think the second change below is critical for correctness.

Proposal 4-2: The 2nd changes in CR

R2-2306259 NR-TRP-LocationInfo for UE-based DL-TDOA and DL-AoD positioning Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.4.0 0454 - F NR\_pos\_enh-Core

are editorial corrections and correct.

* R2-2306259 is merged into R2-2306676

MAC CR:

Proposal 5: The corrections in CR

R2-2304803 Correction to MAC spec for Positoning Enhancements Huawei, HiSilicon, Ericsson, ZTE CR Rel-17 38.321 17.4.0 1614 - F NR\_pos\_enh-Core

are essential corrections.

For change 2, take the suggest wording “Semi-Persistent SRS that is activated according to clause 5.18.17” into consideration according to the comments at last meeting.

For the coversheet, the impact analysis should be moved to Summary of change.

Discussion:

Samsung agree with the wording changes, and they point out that the Source to TSG field should say “R2” and the revision number is needed.

Huawei clarify that the CR is not purely a resubmission/revision.

Agreements:

The corrections in CR

R2-2304803 Correction to MAC spec for Positoning Enhancements Huawei, HiSilicon, Ericsson, ZTE CR Rel-17 38.321 17.4.0 1614 - F NR\_pos\_enh-Core

are essential corrections.

For change 2, take the suggest wording “Semi-Persistent SRS that is activated according to clause 5.18.17” into consideration according to the comments at last meeting.

For the coversheet, the impact analysis should be moved to Summary of change and the “Source to TSG” should say “R2”.

RRC CR:

Proposal 6: For the correction in CR

R2-2305363 Correction on PosSRS-RRC-Inactive-OutsideInitialUL-BWP Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4102 - F NR\_pos\_enh-Core

confirm online whether the unit of the maxSRSposBandwidthForEachSCS-withinCC-FR1-r17 and maxSRSposBandwidthForEachSCS-withinCC-FR2-r17 is MHz. If yes, this CR is essential correction.

Discussion:

Huawei indicate that there are comments to capture the same change in the LPP CR.

Agreements:

The correction in CR

R2-2305363 Correction on PosSRS-RRC-Inactive-OutsideInitialUL-BWP Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4102 - F NR\_pos\_enh-Core

is an essential correction.

Parallel change to be made in the revised LPP rapporteur CR in R2-2306676.

Stage-2 CR:

Proposal 7-1: The correction in CR

R2-2306258 Alert Limit Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0136 - F NR\_pos\_enh-Core

is essential correction but RAN2 to further review the definition of AL following the agreement achieved in RAN2#111. Update the impact analysis to satisfy the prescribed format.

Alert Limit (AL): The maximum allowable positioning error. If the positioning error is beyond this limit, the integrity results of the calculated location may not meet the LCS client service requirement.

Discussion:

CATT clarify the wording in the proposal is from the CR.

Nokia indicate they intended to capture the same concept from the TR, but they tried to avoid the term “positioning system”. They are OK to copy the definition from the previous agreement.

Ericsson prefer the original version and think it aligns with the definition.

ZTE prefer Nokia’s original wording; they find “positioning system” to be an unclear term.

Swift think some discussion would be useful regarding the definition of failure to meet the AL.

Agreement:

Definition to be captured as follows:

Alert Limit (AL): The maximum allowable positioning error for the purpose of integrity. If the positioning error is beyond this limit, the integrity results of the calculated location may not meet the integrity requirement.

Proposal 7-2: Beside the definition of AL, add the definition of TIR to this CR together.

Discussion:

CATT clarify that this was an observation from the rapporteur. Swift think we agreed the TIR definition previously; Nokia confirm it is in the AIP CRs (R2-2304885).

The following documents will not be individually treated

[R2-2304803](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304803%20Correction%20to%20PosSRS%20transmission%20in%20RRC_INACTIVE.docx) Correction to MAC spec for Positoning Enhancements Huawei, HiSilicon, Ericsson, ZTE CR Rel-17 38.321 17.4.0 1614 - F NR\_pos\_enh-Core

* Agreed as R2-2306677, with the changes indicated under the corresponding proposal above:
* For change 2, take the suggest wording “Semi-Persistent SRS that is activated according to clause 5.18.17” into consideration according to the comments at last meeting.
* For the coversheet, the impact analysis should be moved to Summary of change and the “Source to TSG” should say “R2”.

[R2-2306677](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306677%20Correction%20to%20PosSRS%20transmission%20in%20RRC_INACTIVE.docx) Correction to MAC spec for Positoning Enhancements Huawei, HiSilicon, Ericsson, ZTE CR Rel-17 38.321 17.4.0 1614 1 F NR\_pos\_enh-Core

* Agreed

[R2-2305363](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305363%20Correction%20on%20PosSRS-RRC-Inactive-OutsideInitialUL-BWP.docx) Correction on PosSRS-RRC-Inactive-OutsideInitialUL-BWP Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4102 - F NR\_pos\_enh-Core

* Agreed

[R2-2305895](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305895_(Misc%20LPP%20corrections).docx) Miscelaneous LPP Corrections Qualcomm Incorporated (Rapporteur) CR Rel-17 37.355 17.4.0 0448 - F NR\_pos\_enh-Core

* Revised as R2-2306676, with a coversheet correction to identify the third set of consequences, and with nr-Multi-RTT-AdditionalMeasurements field description saying “shall be absent”, and with merges from other CRs as agreed during discussion.
* [AT122][409][POS] Update of LPP rapporteur CR (Qualcomm)

Scope: Update R2-2305895 in line with the discussion of this meeting.

Intended outcome: Agreeable CR in R2-2306676

Deadline: Wednesday 2023-05-24 2000 KST

[R2-2306676](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306676_(Misc%20LPP%20corrections).docx) Miscelaneous LPP Corrections Qualcomm Incorporated (Rapporteur) CR Rel-17 37.355 17.4.0 0448 1 F NR\_pos\_enh-Core

* Agreed

[R2-2306025](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306025%20LPPmisc.docx) Miscellaneous corrections and additions Ericsson, Fraunhofer IIS, Fraunhofer HHI CR Rel-17 37.355 17.4.0 0449 - F NR\_pos\_enh-Core

* Merged into R2-2306676 (without change 2)

[R2-2306026](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306026%20PeriodicCR.docx) Missing finer periodicities than 1s Ericsson CR Rel-17 37.355 17.4.0 0450 - F NR\_pos\_enh-Core

* Postponed

[R2-2306258](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306258%20CR%20to%2038305%20Alert%20Limit%20Definition%20for%20Integrity.docx) Alert Limit Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0136 - F NR\_pos\_enh-Core

* Agreed as R2-2306678, with the definition reworded as in the agreement under P7-1 of R2-2306756.

[R2-2306259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306259%20CR%20to%2037355%20NR-TRP-LocationInfo.docx) NR-TRP-LocationInfo for UE-based DL-TDOA and DL-AoD positioning Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.4.0 0454 - F NR\_pos\_enh-Core

* Merged into R2-2306676

Withdrawn/Not available

R2-2304802 Correction on PosSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 Huawei, HiSilicon CR Rel-17 38.306 17.4.0 0910 - F NR\_pos\_enh-Core Withdrawn

R2-2306086 Correction on Location measurement indication for positioning ZTE Corporation CR Rel-17 38.331 17.4.0 4129 - F NR\_pos\_enh-Core Withdrawn

R2-2306087 Discussion on Location measurement indication for positioning ZTE Corporation discussion Rel-17 38.331 NR\_pos\_enh-Core Withdrawn

# 7 Rel-18

## 7.2 Expanded and improved NR positioning

(NR\_pos\_enh2; leading WG: RAN1; REL-18; WID: RP-223549)

Time budget: 2 TU

Tdoc Limitation: 4 tdocs

### 7.2.1 Organizational

Including incoming LSs and rapporteur inputs.

Incoming LS with RAN2 in Cc:

[R2-2304650](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304650_S2-2305726.docx) Reply LS to Reply LS to LS on SL positioning groupcast and broadcast (S2-2305726; contact: Xiaomi) SA2 LS in Rel-18 Ranging\_SL To:SA3 Cc:RAN2

* Noted

Incoming LSs with “take into account” actions

[R2-2304614](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304614_R1-2304147.docx) Reply LS to RAN2 on error source distributions (R1-2304147; contact: InterDigital) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2

* Noted

[R2-2304615](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304615_R1-2304152.docx) Reply LS on RAN dependency for Ranging & Sidelink Positioning (R1-2304152; contact: Xiaomi) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:SA2

* Noted

[R2-2304657](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304657_S3-232232.docx) Reply LS on LPP message and supplementary service event report over a user plane connection between UE and LMF and LS on UE event reporting over a user plane connection to LCS client or AF (S3-232232; contact: Ericsson) SA3 LS in Rel-18 5G\_eLCS\_Ph3 To:SA2, RAN2, CT1, CT3, CT4

* Noted

Other incoming LSs

[R2-2304647](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304647_S2-2303837.docx) LS on support of multiple Target UEs (S2-2303837; contact: Qualcomm) SA2 LS in Rel-18 Ranging\_SL To:RAN2 Cc:RAN1

* Noted (question is answered in the sidelink positioning LS to SA2)

[R2-2304651](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Docs\R2-2304651.zip) Reply LS to LS to SA2 on Sidelink positioning procedure (S2-2305735; contact: Xiaomi) SA2 LS in Rel-18 Ranging\_SL To:RAN2, RAN1 Cc:SA3

* Postponed

Draft replies

[R2-2305729](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305729%20Draft%20Reply%20LS%20%20to%20SA2%20on%20Sidelink%20positioning%20procedure.docx) Draft Reply LS to SA2 on Sidelink positioning procedure Xiaomi LS out Rel-18 To:RAN1

[R2-2306387](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306387_(Support%20of%20Multiple%20Target%20UEs%20for%20Sidelink%20Positioning).docx) Support of Multiple Target UEs for Sidelink Positioning (draft response LS to R2-2302448 (S2-2303837)) Qualcomm Incorporated discussion

Work plan

[R2-2306253](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306253%20Work%20Plan%20for%20Rel-18%20WI%20on%20Expanded%20and%20Improved%20NR%20Positioning.docx) Work Plan on Rel-18 Positioning Work Item CATT, Intel Corporation, Ericsson Work Plan Rel-18

* Noted

TS 38.355

[R2-2305438](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305438.docx) Further considerations on SLPP specification Intel Corporation discussion Rel-18 NR\_pos\_enh2

Proposal 3: The SLPP ASN.1 design should allow "selective ASN.1 compilation", i.e. The overall SLPP functionality is divided into "groups", where each group is defined as a separate ASN.1 module. A "group" may correspond to a positioning method, but other grouping may also be possible. An implementation needs to compile only the SLPP modules which contain a supported "group" (functionality, positioning method, etc.).

Discussion:

Huawei note this is different from LPP, which has only one module for LPP (and another for posSIB). They would like to understand the use case.

Intel think the main thing is that we would use a container-based approach, such that, e.g., a UE supporting only SL-TDOA would only need to decode the container for SL-TDOA.

Ericsson think we could take this as a WA and look at the impact.

Huawei still have doubts about the use case and why it is different from LPP.

Qualcomm think we should learn from the history of LPP, and we should have done it this way in the beginning. They understand the intention is to containerise functionality as an OCTET STRING and define it in a separate module, so the UE does not need to compile in functionality that it doesn’t support. They understand the concern is the size and memory footprint of the ASN.1 encoder/decoder, which is large in LPP because the device has to support everything.

Huawei wonder why one UE would send something that another UE did not support. Qualcomm indicate it is not about supporting the procedures, but including the ASN.1 encoder/decoder for unsupported features.

CATT interpret that the container is per positioning method, but they think the method support is already included in the capability.

Nokia wonder if we know the pros and cons or might be surprised by some unanticipated consequence.

Intel think we could take a WA to allow these issues to be further examined.

Huawei think companies should provide performance analysis to show the actual gain; otherwise it is a big paradigm shift, and it could be argued that the same issues apply to other ASN.1-based protocols like RRC. Intel point out that we do have separate modules in 38.331.

Qualcomm think this is not really a change of working practice, just a change of how we design the ASN.1 They see the difference being that there is no core mandatory functionality in positioning; everything is optional. They also note that we could not change our mind and do this later if we don’t start with the container approach.

vivo think in the RRC spec, we use containers for signalling from different layers (e.g., NAS), and this is a different approach. Here they do not see that it is needed since the signalling does not come from different entities. They would prefer to leave it open for now.

Intel note that we have containerisation in RRC for other cases like capability and forwarding of configurations, not just for PDUs from other entities. vivo understand this this relates to different features.

Agreement:

WA: The SLPP ASN.1 design should allow "selective ASN.1 compilation", i.e. The overall SLPP functionality is divided into "groups", where each group is defined as a separate ASN.1 module.

[R2-2305439](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Docs\R2-2305439.zip) TS 38.355 v0.0.3 Intel Corporation draft TS Rel-18 38.355 0.0.3 NR\_pos\_enh2

* Endorsed

Discussion:

Huawei think there will be something to implement from this meeting, so maybe we capture it in a revision.

Qualcomm are fine with endorsing this version, but they think the ASN.1 text in the spec should follow the 38.331 approach with landscape/spaces instead of portrait/tabs. Intel are willing to try to do this for the next version.

Running CRs (excluding TS 38.355 draft)

[R2-2304769](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304769%20LPP%20running%20CR%20for%20RAT-dependent%20integrity.docx) LPP running CR for RAT-dependent integrity CATT draftCR Rel-18 37.355 17.4.0 B NR\_pos\_enh2

* Noted

Discussion:

CATT clarify this CR is provided for information and comments can be taken offline.

[R2-2305896](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305896_(Running%20Stage%202%20CR)_v00.docx) Running Stage 2 CR for 'Expanded and improved NR positioning' Qualcomm Incorporated draftCR Rel-18 38.305 17.4.0 B NR\_pos\_enh2-Core

* Noted

Discussion:

CATT think we could have a post-email discussion to update the stage 2 CR. Qualcomm think it is not needed for discussing the skeleton at this stage.

### 7.2.2 Sidelink positioning

Positioning architecture and signalling procedures (e.g. configuration, measurement reporting, etc) to enable sidelink positioning. Including measurements to enable RTT-based positioning, SL-AoA, and SL-TDOA; signalling and associated UE behaviour for support of unicast, groupcast (not including many-to-one) and broadcast of SL-PRS transmissions; reporting signalling and procedures to facilitate support of SL positioning in all coverage scenarios and for PC5-only and joint PC5-Uu scenarios; and signalling to NG-RAN for SL positioning and service authorization as needed.

Agenda item summary and report of [AT122][401]

[R2-2306757](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Docs\R2-2306757.zip) [Pre122][401][POS] Summary of AI 7.2.2 on sidelink positioning (Xiaomi) Xiaomi discussion Rel-18

* [AT122][401][POS] Sidelink positioning summary proposals (Xiaomi)

Scope: Discuss and gauge support on the proposals in R2-2306757, converge on easily agreeable parts, and identify discussion points for the online session on Wednesday 2023-05-24.

Intended outcome: Summary to online session in R2-2306671

Deadline: Tuesday 2023-05-23 2000 KST

[R2-2306671](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306671%20Report%20of%20%5bAT122%5d%5b401%5d%5bPOS%5d%20Sidelink%20positioning%20summary%20proposals%20(Xiaomi)-v1.doc) [AT122][401][POS] Sidelink positioning summary proposals (Xiaomi) Xiaomi discussion Rel-18

Proposal for easy agreement:

Proposal 1: SLPP over PC5-U/Uu will support reliable transport for at least unicast. FFS groupcast

Proposal 1a: Inform SA2 about our agreement on reliable transport.

Proposal 2: SLPP carried over NAS is used between UE and LMF. FFS on how to manage the session/transaction.

Proposal 5: Session ID is included in the SLPP message between UEs.

Discussion:

InterDigital wonder on P5 if we should consider putting the session ID in L1. Their concern is that one UE could have two different sessions with IDs that collide. Xiaomi agree there needs to be some mapping between the session and the PHY resources.

Huawei are OK with the first three proposals; for the session ID, they think there is only one positioning session even with multiple target UEs, and they do not see the need to transport the session ID.

Lenovo wonder if there would be any impact to SA2 on reliable transport. Intel think the issue is that SA2 did not use TCP for transport, and V2X and ProSe do not have reliable transport. Huawei agree with Intel.

Lenovo think we could include additional agreements as well.

vivo think P5 should say “may be included”. They think even if there is just one session per LCS request, there may be multiple LCS requests between the server and the anchor UE(s).

Intel have some sympathy with Huawei; we need some mechanism to distinguish the session, but we should analyse other alternatives. E.g., they think it may be possible to distinguish the session implicitly based on the message types.

OPPO wonder what the purpose is of the LS to SA2; do we want them to do something like locating TCP under ProSe?

Agreements:

SLPP over PC5-U/Uu will support reliable transport for at least unicast. FFS groupcast.

Inform SA2 about our agreements on sidelink positioning, with “take into account” action.

SLPP carried over NAS is used between UE and LMF. FFS on how to manage the session/transaction.

* [AT122][423][POS] LS to SA2 on sidelink positioning agreements (Intel)

Scope: Draft an LS to SA2 informing them of this meeting’s agreements on sidelink positioning. Expected action is “take into account”.

Intended outcome: Approvable LS in R2-2306696

Deadline: Thursday 2023-05-25 2000 KST

Proposals for further discussion

Proposal 3: Anchor UE selection criterion will not be specified. FFS on RSRP.

Proposal 4: RAN2 thinks the following information are useful for the anchor UE selection:

1. UE role (4)

2. Supported positioning method (4)

3. In coverage or not (5)

4. RSRP (6)

5. LOS/NLOS (4)

6. Location (4)

7. PLMN (1)

Discussion:

Fraunhofer think P3 and P4 contradict each other. They suggest saying that anchor UE selection is helped by the information in P4.

Huawei wonder which items in the list are related to AS. They understand SA2 view is that the anchor and target need to be under the same PLMN, but this is not an AS criterion.

ZTE agree that the list should be downselected; they do not think IC/OOC is useful. They also wonder if there is only stage 2 spec impact; they think there should be no ASN.1 signalling to enforce such information transmission in SLPP.

OPPO think it is too early to decide if there is stage 3 impact. E.g., an RSRP threshold could be transmitted.

Intel think we discussed offline whether there was signalling impact, and there was no consensus. They also think we should consider which layer does the selection.

Nokia have some sympathy for a list of parameters, but they would like to have a dynamic system where different parameters are configured based on need. They think it is conceivable that the LMF indicates which anchor UEs should be used.

CeWiT sympathise with Intel’s comment; they think which layer will consider which parameter is not so clear, and it may be different for different parameters.

vivo assume this list is intended for the discovery metafield, and maybe we can clarify this.

Huawei think the current proposal is quite open.

Samsung support the agreement but foresee some stage 3 impact. They think some of the information can be in the discovery metafield, while some (e.g., RSRP) can be in the discovery response.

Apple wonder if no normative requirement means selection would be up to UE implementation. They think this is not clear.

CeWiT also think there may be stage 3 impact.

Qualcomm wonder if the UE role is automatically known from discovery.

Intel think we should focus on the impact to our work, and they do not see a lot of impact here.

Xiaomi understand some companies may feel that certain information in the list comes from different layers, and maybe we should not commit to considering it all in RAN2.

vivo wonder about server UE selection; Huawei agree that this might be different, but maybe it is too early to discuss or not in our scope.

Nokia think there could be a mix of static and dynamic parameters.

Agreements:

Anchor UE selection is supported by information about the candidate anchor UEs. At least the following list can be discussed for use in anchor UE selection:

1. UE roles

2. Supported positioning method

3. In coverage or not

4. RSRP

5. LOS/NLOS

6. Location

7. PLMN

A normative requirement on which anchor UEs to select (e.g., ranking) will not be specified.

RAN2 impact of this information to be determined.

FFS which information would be determined statically/dynamically.

Proposal 6: RAN2 to discuss whether anchor UE selection can be performed by a UE different from the UE who initiates the SLPP session.

Proposal 7: RAN2 to discuss whether multiple target UEs (absolute positioning) or multiple UE pairs (Ranging/relative positioning) per LCS request is supported or not.

Discussion:

Ericsson understand SA2 have agreed to multiple target UEs.

Qualcomm think the proposal is not precise; they understand that multiple target UEs in an LCS request is supported in SA2, and the question here is about SLPP sessions. Huawei have the same understanding, and they wonder if it is necessarily tied to groupcast/broadcast.

OPPO wonder if we really need to support absolute positioning with multiple target UEs; in typical use cases they do not see why the network would be interested in this, and they see complexity in supporting it. They think it is OK for relative positioning/ranging.

Qualcomm think we do not need to distinguish use cases; it is just about SLPP design. They think it would take work to prevent multiple target UEs.

Ericsson have the same view as Qualcomm, and they think since we have agreed that SLPP can be used between LMF and UE, there are valid use cases there.

Xiaomi think the complexity mainly relates to whether group management would be supported.

Intel understand the group ID should be provided from upper layers and would map to multiple UEs.

Agreements:

SLPP can support multiple target UEs in the same session when LCS requests.

RAN2 will not specify group management for multiple target UEs. RAN2 assumption is that a group ID will be provided from upper layers.

FFS how session IDs are managed between multiple UEs.

Proposal 8: RAN2 to discuss whether to support groupcast/broadcast for session-based scenario if multiple target UEs (absolute positioning) or multiple UE pairs (Ranging/relative positioning) per LCS request is not support.

Proposal 8a: RAN2 to discuss whether to support both broadcast and groupcast for session-less scenario to avoid mutual exchange of SLPP messages.

Proposal 9: RAN2 to discuss which of the following understanding is correct regarding “a SLPP session is used among UEs”:

- Option 1: the concept that a session is maintained between two endpoints is still maintained, but there is at most one session between any pair of UEs who are involved to support the same location request which is Ranging/SL Positioning service request defined in TS 23.586.

- Option 2: the concept that a session is maintained between two endpoints is not maintained, multiple UEs can be involved in one session for the location request which is Ranging/SL Positioning service request defined in TS 23.586.

Proposal 10: If RAN2 agrees that the concept that a session is maintained between two endpoints is not maintained, RAN2 to discuss whether explicit SLPP session creation/modification/termination are introduced(3:3).

Proposal 11: RAN2 to discuss SL-PRS priority is based on which of the following:

- SLPP transport QoS;

- Ranging/SL Positioning QoS

Proposals related to SA2 and SA3 LS:

Proposal 12: RAN2 to discuss whether to reply SA2 based on the agreement of anchor UE selection in this meeting.

Discussion:

Samsung think we have not addressed the second question in the SA2 LS. Intel understand that SA2 only need to know whether multiple target UEs can be supported.

Proposal 13: RAN2 to discuss whether to support relative velocity in Rel-18, or left to RAN1 to decide on this.

Discussion:

Intel understand that this is addressed by RAN1 and it is not in RAN2 scope. Samsung agree. Xiaomi also agree, but they think RAN1 did not promise to support it without additional measurements or design work; they think this should be left to RAN1.

Proposal 14: RAN2 to discuss whether to reply SA3 based on the agreement of groupcast/broadcast in this meeting.

Discussion:

Intel indicate that this LS was a previous question about groupcast/broadcast, and we do not have anything to report.

Xiaomi understand that SA3 are a bit stuck and would like to know about groupcast for sessionless scenarios.

R2-2306696 (LS from [423]) Intel Corporation LS out Rel-18 To:SA2

The following tdocs will not be individually treated

[R2-2304716](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304716.docx) Discussion of signalling procedures Nokia, Nokia Shanghai Bell discussion Rel-18

[R2-2304717](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304717.docx) Session-less SL positioning and groupcast / broadcast messaging Nokia, Nokia Shanghai Bell discussion Rel-18

[R2-2304770](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304770%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning CATT discussion Rel-18 NR\_pos\_enh2

[R2-2304801](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304801%20Discussion%20on%20sidelink%20positioning_v02.docx) Discussion on Sidelink Positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2304949](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304949_Sidelink_Fraunhofer.docx) UE Positioning using Sidelink Fraunhofer IIS, Fraunhofer HHI discussion R2-2302588

[R2-2305066](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305066-SL-PRS-config-v0.docx) SL PRS configuration Apple discussion Rel-18 NR\_pos\_enh2

[R2-2305067](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305067-pos-broadcast-v0%202.docx) SL positioning groupcast and broadcast Apple discussion Rel-18 NR\_pos\_enh2

[R2-2305068](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305068-reply-LS-on-SL-POS-security.docx) [DARFT] Reply LS on SL positioning groupcast and broadcast Apple LS out Rel-18 NR\_pos\_enh2 To:SA3 Cc:SA2

[R2-2305137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305137%20SLPP%20and%20session%20aspects.doc) Further discussion on SLPP and session-based SL positioning Lenovo discussion Rel-18 NR\_pos\_enh2

[R2-2305331](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305331%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2305343](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305343%20Further%20discussion%20on%20sidelink%20positioning.docx) Further discussion on sidelink positioning OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2305344](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305344%20Further%20discussion%20on%20%20anchor%20UE%20reselection%20for%20sidelink%20positioning.doc) Further discussion on anchor UE reselection for sidelink positioning OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2305392](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305392_SLPosArch.docx) On SL Positioning Architecture Aspects Lenovo discussion Rel-18

[R2-2305440](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305440.docx) Further considerations on sidelink positioning Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2305509](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305509_SL_Pos_Res.docx) Considerations on sidelink positioning resources Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2305562](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305562%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning Spreadtrum Communications discussion Rel-18

[R2-2305636](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305636%20Considerations%20on%20Sidelink%20positioning.doc) Considerations on Sidelink positioning CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2305730](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305730%20Draft%20Reply%20LS%20%20to%20SA3%20on%20SL%20positioning%20groupcast%20and%20broadcast.docx) Draft Reply LS to SA3 on SL positioning groupcast and broadcast Xiaomi LS out Rel-18 To:RAN1

[R2-2305731](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305731%20Discussion%20on%20SL%20positioning.doc) Discussion on SL positioning Xiaomi discussion Rel-18

[R2-2305768](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305768%20(R18%20NR%20POS%20A722%20SL%20POS).docx) Discussion on Sidelink positioning InterDigital Inc. discussion Rel-18 NR\_pos\_enh2

[R2-2305867](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305867.docx) LMF roles and protocols for sidelink positioning MediaTek Inc. discussion NR\_pos\_enh2-Core

[R2-2306020](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306020%20Sidelink.docx) Sidelink positioning Ericsson discussion Rel-18

[R2-2306078](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306078%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2306145](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306145%20(7.2.2)%20SLPP%20design%20in%20session%20perspectives.docx) SLPP design for session aspects Samsung R&D Institute UK discussion

[R2-2306334](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306334%20SLPP%20session%20management%20and%20operation.docx) SLPP session management and operation LG Electronics Inc. discussion Rel-18

[R2-2306335](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306335%20SLPP%20reliable%20transport%20functionality.docx) SLPP reliable transport functionality LG Electronics Inc. discussion Rel-18

[R2-2306336](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306336%20Sidelink%20positioning%20parameters%20for%20Anchor%20UE%20selection.docx) Sidelink positioning parameters for Anchor UE selection LG Electronics Inc. discussion Rel-18

[R2-2306373](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306373%20Discussion%20on%20sidelink%20positioning%20parameters%20in%20discovery%20signalling.doc) Discussion on Sidelink positioning parameters in discovery signalling Samsung discussion Rel-18 NR\_pos\_enh2

[R2-2306422](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306422_(Sidelink%20Positioning).docx) Sidelink Positioning Protocol (SLPP) Signaling and Procedures Qualcomm Incorporated discussion

[R2-2306446](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306446-Further%20discussion%20on%20SL%20positioning%20procedures%20and%20signaling%20protocols%20for%20SL%20positioning.docx) Further discussion on SL positioning procedures and signaling protocols for SL positioning CEWiT discussion

[R2-2306457](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306457%20SL%20pos%20server.doc) On the support of SL positioning server functionality Philips International B.V. discussion NR\_pos\_enh2 R2-2304182

[R2-2306515](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306515_On%20the%20selection%20of%20Anchor%20UEs%20for%20Sidelink%20Positioning.doc) On the selection of Anchor UEs for Sidelink Positioning Philips International B.V. discussion NR\_pos\_enh2 R2-2303753

### 7.2.3 RAT-dependent integrity

Error modelling parameters, signalling, and procedures to support UE-based and LMF-based integrity of RAT-dependent positioning methods.

[R2-2304800](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304800%20Discussion%20on%20RAT-dependent%20integrity_final.docx) Discussion on RAT-dependent Integrity Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

DNU flag

Proposal 1: The DNU flags in TRP-related assistance data (e.g., TRP location and Inter-TRP synchronization) are provided per error source.

Signaling aspects

Proposal 2: For UE-based integrity, support the following enhancements:

 LPP signaling to deliver the error of related assistance data from LMF to UE, which at least includes:

 TRP location error for DL-TDOA and DL-AoD

 Inter-TRP synchronization error for DL-TDOA

Discussion:

Huawei understand that CATT’s running CR already captures P1/P2.

Proposal 3: For LMF-based integrity, confirm on the working assumption in RAN2#121bis and no spec change is required.

Signaling of request/response of RAT-dependent integrity results

Proposal 4: For the request of RAT-dependent integrity results, reuse the legacy signaling in commonIEsRequestLocationInformation. No spec change is needed.

Text Proposal

Proposal 5: For stage2 description of RAT-dependent integrity, move the section of “Integrity Principle of Operation” to a generic section that is not specific to positioning methods

Discussion:

Huawei indicate the current stage 2 CR has separate “principle of operation” sections, and they do not see the need to do this. Qualcomm agree that this makes sense, and we can void the old section and create a new one.

vivo think we already agreed this last meeting. Qualcomm clarify that that agreement was about the RAT-dependent methods only.

Agreement:

For stage2 description of RAT-dependent integrity, move the section of “Integrity Principle of Operation” to a generic section that is not specific to positioning methods.

Proposal 6: Consider the text proposal of LPP in the Annex as a baseline for the support of UE-based RAT-dependent positioning integrity.

[R2-2306022](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306022%20Integrity.docx) RAT Dependent positioning Integrity Ericsson discussion Rel-18

WAs and LMF-based integrity

Proposal 1 The working assumption from RAN2-121-bis-e is incorrect and should be revised

Proposal 2 Agree to that capable UE and gNB will provide measurement error source bound distributions to LMF for LMF-based integrity

Proposal 3 It is up to implementation how the UE/TRP establishes measurement error statistics and bounds, where a UE/TRP can be expected to measure outside the response time window in order to establish sufficient statistics.

Discussion:

Ericsson clarify that the discussion at the last meeting focussed on what the UE can do under certain conditions, and we need to look at when the reporting is possible. They understand that the UE may be able to identify bounds for its error sources.

Nokia have a similar understanding that it is better for the UE to report the statistics rather than relying on the LMF implementation. They see an analogy to measurement collection in MDT, and they think the UE is in a better position to gather the information and provide statistics to the LMF.

Qualcomm do not see why the UE should provide these statistics, and they see nothing wrong with the WA. They understand that the available information on the radio environment should allow an LMF to come up with a metric for the error.

OPPO do not see why the UE should report a metric to the LMF; the UE only sends the signal to the TRP, and the TRP will do the measurement. They think the error bounds cannot be known a priori by the UE, and we should wait for RAN1 feedback.

Intel agree with Qualcomm and OPPO and do not see why the UE should provide the statistics. They also think we should wait for RAN1.

CATT understood from the RAN1 LS on error bounds that the existing IEs can be used to derive the value range and no additional reporting is required.

ZTE think CATT’s interpretation is correct, but they do not agree that the timing quality is reported to the LMF. They think the UE/TRP reporting of the timing error bound of a measurement can be done, according to the RAN1 LS. So they agree with UE reporting.

Qualcomm think RAN1 have not said we can use the timing quality as a measure of error per se; we have to define a standard deviation and a mean, so this is a different issue.

Nokia understand that RAN1 said the existing IEs can be used as a guideline for the mean and standard deviation, but they do not see a direct connection to what is reported. They also are not sure what information from the UE the LMF needs to come up with the statistics.

Error sources and bounds

Proposal 4 DL TDOA timing quality and bounds refers to the combination of timing measurement error and any UE Rx TEG offset

Proposal 5 Multi RTT timing quality and bounds refers to the combination of timing measurement error and any UE Rx/Tx/RxTx TEG offsets

Discussion:

Ericsson understand that we need these errors calibrated and bounded.

Qualcomm think the measurement error depends on other factors as well: noise, multipath, etc., and there is not a clear motivation to separate the TEG offsets from the rest.

Ericsson indicate that the TEG offsets are stationary errors while the other aspects are dynamic.

Qualcomm think the LMF needs to take into account the whole error as reported. They see that if we define what the UE and TRP should report, this could apply.

vivo understand that these proposals are already agreed in RAN1, and they are confused about the spec impacts in RAN2, especially if we agree on the WA in the end.

Proposal 6 Represent the TRP and ARP location errors by a Gaussian over-bounding or paired over-bounding.

Proposal 7 The error bound of the relative timing difference between two DL PRS resources combines the relative time difference error and any TRP Tx TEG offsets

Proposal 8 Represent the RTD errors by a Gaussian over-bounding or paired over-bounding.

Discussion:

ZTE wonder about the spec impact difference between the RAN1 guidance for gaussian overbounding and paired overbounding; they do not think the latter is needed.

Ericsson think the need for paired overbounding is clear from the structure.

Qualcomm understand that RAN1 said we have a mean and standard deviation, which implies paired overbounding, but it will collapse if the mean is zero.

OPPO ask who should evaluate the location error; they are not sure RAN2 can decide it. Qualcomm understand we had the agreement that it is up to implementation, but anyway integrity depends on good observations of the error sources. Qualcomm assume PRUs are the natural way to take such observations.

Ericsson agree with Qualcomm that we do not need to decide how the error information is retrieved. OPPO indicate the motivation for the question is the IE value range to be captured in stage 3.

ZTE think RAN1 did not give us guidance on nonzero mean values, and they wonder if we need another LS to RAN1 asking for values of the mean for paired overbounding. Qualcomm think we should not overload RAN1, and it would be reasonable to take the same range for the mean as for the standard deviation. Ericsson agree that this can be looked at as part of the stage 3 work.

ZTE wonder if we should inform RAN1 of our decision. Qualcomm think we should start by proposing a value range and then decide if we need to check with RAN1.

Nokia understand RAN1 agreed about the distribution, we are agreeing to make the assumption that it is a gaussian distribution, and the paired overbounding defines the error distribution.

Agreements:

Represent the TRP and ARP location errors by a Gaussian paired over-bounding.

Represent the RTD errors by a Gaussian paired over-bounding.

Signalling for UE-based integrity

Proposal 9 Add TIR, AL and TTA to the integrity assistance data that the UE can request for on a need basis to support UE-based integrity calculations

Proposal 10 Agree to the text proposal in Annex A.

Discussion:

Ericsson clarify that this is needed for the UE to operate UE-based integrity in full isolation from the network. In previous discussions it was suggested that the values could come from the UE implementation, and the proposal is to support a UE that does not have such implementation capabilities requesting them as assistance data.

Qualcomm think the AL and TTA are not needed for the UE to calculate the PL; they understand that whatever application wants to make use of integrity will have access to them, and the UE just provides the PL for the achievable TIR. They understand the UE processing will not change with or without these values.

vivo generally agree with Qualcomm and think the mode for integrity reporting is a separate discussion; the proposal here is to include the KPIs in the AD request, but they do not fully understand the scenario. For MT-LR, the KPIs will be available from upper layers, and for MO-LR the UE knows them.

Xiaomi understand that this would support mode 2 reporting for UE-based integrity. They are not sure that the UE can get the KPIs from the application layer every time.

CATT are not sure what the difference is between RAT-dependent and RAT-independent in respect of the AL and TTA; why do we need them here.

Lenovo agree with vivo and think the current signalling for UE-based integrity supports the needed information in the location information transfer.

OPPO think it is not useful to include these KPIs in the assistance data. For mode 1 the UE does not need them, and they do not see the UE needing them in MT-LR where the request comes from an external client.

Ericsson emphasise that this proposal is about assistance data, not location information transfer. They see it as a way of provisioning the parameters to the UE for cases where the KPIs may not be known in advance.

Qualcomm understand that the proposal is for preconfiguring a UE with appropriate values for a particular use case, and they see this as not fitting into a positioning protocol and perhaps not even into a standard, but more as operator configuration of the UEs.

CATT wonder why there are no such KPIs signalling in the GNSS case. Ericsson think the proposal could apply also to GNSS.

Intel think we discussed this in Rel-17 and did not agree to it, and there is not so much support now.

Signalling for LMF-based integrity

Proposal 11 For LMF-based integrity for RAT-dependent positioning, the R17 UE-assisted integrity mode signaling can be used as baseline with the following aspects and agree to the text proposal as in Annex:

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

• LMF provides the Assistance Data for Positioning (same as legacy) and request for Integrity error sources

• UE performs positioning measurements and computes the error (same as legacy)

• UE generates error sources for the requested measurements using mean and standard deviation and provides to the LMF using LPP

• LMF computes the Integrity.

Discussion:

vivo think this depends on reverting the WA. Ericsson agree this is true of the second-to-last bullet and the one before it. Ericsson think we can take this as part of the discussion of the running CR.

Proposal 12 For LMF-based positioning integrity mode, LMF requests UE to send error source statistics of error source in the RequestLocationInformation for each RAT positioning method.

Proposal 13 Agree to the LPP text proposal in Annex B.1

Proposal 14 For LMF-based positioning integrity mode, UE sends the error source statistics in the SignalMeasurementInformation message for the corresponding positioning method.

Proposal 15 Agree to the LPP text proposal in Annex B.2

[R2-2305668](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305668%20Discussion%20on%20RAT-dependent%20positioning%20integrity.doc) Discussion on RAT-dependent positioning integrity Xiaomi discussion

LS to RAN3

Proposal 1: We suggest RAN2 send LS to RAN3 to capture the agreements on the RAT-dependent positioning integrity and also include the following understanding:

 The TRP related error sources which include TRP location and Inter-TRP synchronization are up to LMF implementation;

 The DNU flag for the TRP location and Inter-TRP synchronization is determined by LMF based on implementation;

 The measurement error source bound distribution including RSTD, RTOA, UE Rx-Tx time difference, gNB Rx-Tx time difference, Angle of arrival measurement and DL-PRS RSRPP of the first path or RSRP are up to LMF implementation.

Discussion:

Xiaomi understand that there may be no LPP impact, but RAN3 may need to take our agreements into account in NRPPa.

ZTE think we agreed that RAN3 should discuss these aspects, and they do not see that an LS is necessary, and points 2 and 3 are related to the WA.

Xiaomi think we have not informed RAN3 of our agreements on the TRP error sources being up to LMF implementation. ZTE understand this is in the WA for timing error, but the location error and sync should come from the TRP. However, they think this is not implementation.

Intel understand we agreed the TRP will not provide the location and sync errors to LMF; it is up to LMF implementation, and this is an agreement, not a WA. They think discussion can proceed in RAN3.

OPPO think we did not make such an agreement on TRP location and sync error, and we need to wait for RAN1 feedback. Intel checked the agreements and found that we left determining the TRP location and RTD error sources to deployment and implementation.

DNU flags

Proposal 2: For UE based positioning integrity, LMF sends DNU flag by LPP provide assistance message and the DNU flag indicates the TRPs which are not usable for positioning integrity.

Proposal 3: If RAN1 confirms the working assumption of the measurement error source bound distribution, then the DNU flag for measurements is unnecessary regardless of whether RAN1 deems it necessary or not.

Modes 1 and 2

Proposal 4: Both Mode 1 and Mode 2 of Integrity Result Reporting should be specified for RAT-dependent positioning integrity.

WAs on LMF-based integrity

Proposal 5: There is no LPP spec impact on LMF based positioning integrity if the above working assumption is confirmed.

[R2-2304771](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304771%20Discussion%20on%20RAT-Dependent%20integrity.docx) Discussion on RAT-dependent Integrity CATT discussion Rel-18 NR\_pos\_enh2

[R2-2305332](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305332%20Signaling%20design%20of%20UE-based%20RAT-dependent%20integrity.docx) Signaling design of UE-based RAT-dependent integrity vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2305341](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305341%20Consideration%20on%20RAT-dependent%20positioning%20integrity.docx) Consideration on RAT-dependent positioning integrity OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2305441](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305441.docx) Further considerations on RAT dependent integrity Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2305563](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305563%20Discussion%20on%20RAT-dependent%20integrity.docx) Discussion on RAT-dependent integrity Spreadtrum Communications discussion Rel-18

[R2-2305624](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305624.docx) Discussion on the RAT-dependent integrity issues CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2305642](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305642%20(R18%20NR%20POS%20A723%20RAT%20dependent%20integrity).docx) Discussion on RAT dependent integrity InterDigital, Inc. discussion Rel-18

[R2-2305709](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305709%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent integrity Lenovo discussion Rel-18

[R2-2305823](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305823_(integrity).docx) Integrity of NR Positioning Technologies Qualcomm Incorporated discussion

[R2-2306076](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306076%20Discussion%20on%20RAT-dependent%20methods%20positioning%20integrity.docx) Discussion on RAT-dependent methods positioning integrity ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2306255](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306255%20LMF-based%20integrity.docx) LMF-based Integrity Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core

### 7.2.4 LPHAP

Enhancements for enabling LPHAP use case 6 (TS 22.104), including extending eDRX cycle (coordinated with RedCap WI); SRS configuration enhancements based on validity area for UEs in RRC\_INACTIVE; DL-PRS measurements in RRC\_IDLE and reporting in RRC\_CONNECTED; and alignment between eDRX and PRS configurations.

Agenda item summary

[R2-2306540](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306540_(7.2.4%20LPHAP%20Summary)_v2.docx) Summary of AI 7.2.4: LPHAP Qualcomm Incorporated discussion

Extending eDRX cycle beyond 10.24s in RRC\_INACTIVE

Proposal 1: Send a LS to RAN1 to ask/confirm whether the eRedCap agreed eDRX cycle values are also suitable/sufficient for positioning.

Discussion:

Huawei are OK with the LS but think it should also go to RAN4.

* [AT122][415][POS] LS to RAN1/RAN3/RAN4 on LPHAP agreements (Huawei)

Scope: Draft an LS to RAN1/RAN3/RAN4:

* Ask RAN1/RAN4 for confirmation on whether the eRedCap agreed eDRX cycle lengths are sufficient for positioning;
* Indicate to RAN3 our conclusions on area-specific SRS configuration by LMF;
* Request from RAN1 the parameters for the area-specific SRS configuration.

Intended outcome: Approvable LS in R2-2306700

Deadline: Thursday 2023-05-25 2000 KST

SRS configuration enhancements:

Validity Timer and/or explicit release by the network

Proposal 2: RAN2 to continue discussion/evaluation whether a "validity timer" for the SRS configuration should be introduced.

TA validation / maintenance

Proposal 3: Define an SRS for positioning validity-area specific TA timer (e.g., with larger values) for a UE in RRC\_INACTIVE state. FFS on the details.

Proposal 4a: The UE starts/restarts the area-specific TA timer when it receives the TA configuration.

- The UE stops the SRS transmission when the area-specific TA timer expires.

- The UE stops the area-specific TA timer when it reselects to a cell out of the SRS validity area.

Proposal 4b: RAN2 to discuss/evaluate further whether

- The UE does release the SRS configuration when the area-specific TA timer expires, or

- The UE does not release the SRS configuration when the area-specific TA timer expires.

Discussion:

ZTE think the timer should be stopped in additional cases, e.g., on receipt of some RRC signalling, aligned with Rel-17.

Ericsson think this is already agreed in RAN1. Qualcomm understand RAN1 agreed it is feasible, but it is up to RAN2 to decide whether to do it.

CATT indicate that RAN1 also discussed the TA timer, and there are other conditions for timer restart under discussion there.

Huawei understand that TA maintenance is not discussed in RAN1, only the feasibility, and it is up to RAN2 (in MAC spec) to decide how to maintain it. They would like to know if “TA configuration” also includes the TA command. Qualcomm understand they are the same concept, but the MAC calls it “TA command”.

Ericsson wonder if it means the UE will not follow the legacy TA timer. They are not sure if the benefits have been shown.

ZTE understand that RAN1 are likely to agree that TA adjustment can be done by the UE, but not across cells, so the TA timer can be scoped to the validity area. On the stop conditions, they checked and the RRCSetup and RRCResume stop the Rel-17 TA timer.

Qualcomm think there was no proposal for the RRC signalling, and other criteria can continue to be discussed.

Huawei think the interaction with legacy TA timer can be discussed under stage 3; they think a new time might be cleaner.

Ericsson wonder how we will define the maintenance of two timers. They also are not sure how the TA command will arrive while the UE is in RRC\_INACTIVE.

CATT note in Rel-17, there is a cell-specific TA timer, and the UE cannot send out the SRS once the timer is not valid; and we have now introduced area-specific SRS, and they want to clarify the interaction between the two timers.

OPPO think we do not need to maintain two timers simultaneously; when the UE receives an SRS configuration for an area, only the area-specific timer should be running. They prefer only one timer for UE implementation simplicity.

Intel assume if you also configure SDT, the existing timer will govern that, and you could also have the area-based timer for SRS.

InterDigital are OK with the current proposal and we can continue to discuss based on contributions. They do not see a need for two timers maintained simultaneously because they are for different RRC states.

Ericsson feel we still need to understand if there is a problem with using the legacy timer. They have not seen the benefit.

ZTE do not see a case where a Rel-18 UE would have Rel-17 cell-specific SRS and Rel-18 area-specific SRS at the same time, so they do not see interaction between two timers.

CMCC agree with other companies that there should be one timer for the area-valid SRS; they see the cell-specific timer as not enough since it only applies within the cell.

Huawei indicate the intention of the timer is to allow the UE to continue transmitting SRS within the validity area, and we have assessed the benefits of the validity area during the SI.

Ericsson think it is a stage 3 discussion whether we can reuse the existing timer.

Agreements:

Define an SRS for positioning validity-area specific TA timer (e.g., with larger values) for a UE in RRC\_INACTIVE state.

- The UE starts/restarts the area-specific TA timer when it receives the TA command.

- The UE stops the SRS transmission when the area-specific TA timer expires.

- The UE stops the area-specific TA timer when it reselects to a cell out of the SRS validity area.

- Other stop/restart conditions can be discussed.

Node determining the validity area / coordination across gNBs

Proposal 5: The "validity area" for the SRS for positioning configuration in RRC\_INACTIVE state is determined by the LMF, based on negotiation/coordination with related gNBs.

Discussion:

Huawei think this has to be done at the LMF; otherwise we would introduce Xn mechanisms for the gNB to determine it.

Ericsson think the serving gNB can coordinate over Xn and determine a validity area; in any case they see there is something for RAN3 to do, and we could leave open whether it is Xn or NRPPa.

Qualcomm doubt that there will be enough Xn connectivity, and they point out that the LMF always sees all the gNBs in its service area.

CATT think it is RAN3 scope and RAN3 are also discussing it; they think the topic could be left to RAN3, but they also agree that there will not always be enough Xn connectivity.

Samsung also think it is a RAN3 issue, but they think the LMF is the reasonable node to take the decision.

Xiaomi think since RAN2 introduced the validity area, we should decide which node determines it. They also note that currently the SRS resources are coordinated by the LMF.

Ericsson think we could say from RAN2 perspective it is feasible that LMF does it, but the final decision is in RAN3.

Qualcomm think it is really RAN2 business; we should come up with the stage 2 functionality and requirements, and RAN3 may not have the full picture. They assume companies are coordinated between groups.

Intel agree with Qualcomm.

Fraunhofer wonder if we should give indications of what parameters are needed.

Agreements:

RAN2 consider that the LMF should determine the area-specific SRS configuration. Details are up to RAN3.

LS to RAN3 to indicate this conclusion, including RAN1 to prompt them for parameters. To be included in the LS from [AT122][415].

Provisioning of pre-configured SRS

Proposal 6: RAN2 to discuss whether the SRS for positioning configuration for use in RRC\_INACTIVE state (with or without area validity) can also be provided via system information. FFS posSIB or normal SIB.

Proposal 7: The SRS for positioning configuration for use in RRC\_INACTIVE state (with or without area validity) can also be provided while the UE is in connected state.

Multiple SRS configurations

Proposal 8: The UE can be pre-configured with one or more SRS for positioning configurations for RRC\_INACTIVE state. If the SRS configuration has an "area validity", the multiple SRS configurations have a different "validity area".

"SRS configuration request" vs. "SRS activation request"

Proposal 9: RAN2 to discuss whether the SRS activation request for pre-configured SRS can be indicated via Msg3/MsgA transmission when an event is detected. FFS if the request is in the RRC message or an accompanying MAC CE.

Discussion:

ZTE think the message should not be sent “when an event is detected”, because an event like cell reselection may occur frequently. They suggest “when UE moves out of the validity area”.

Qualcomm think there is some confusion between the activation request and the configuration request. They understand that the question here is how the UE gets permission to transmit. For the configuration request, the event-triggered message goes to the LMF which negotiates the SRS configuration. For the activation request, they understand the SRS configuration is valid and a new configuration is not needed, but the UE needs permission from the gNB to activate the SRS transmission.

OPPO think if the SRS has already been configured (e.g., preconfiguration), the UE should not need to get activation permission from the gNB, and the signalling for the request consumes UE power.

Huawei agree with Qualcomm and think this is what has been proposed historically. For the configuration, it is when the UE needs a new configuration, and the activation is for when the UE has a valid configuration and wants permission to transmit it. They think the two can be enabled with the same request.

Samsung agree with Qualcomm and Huawei, and for the activation message, they want to leave it open to potentially use Msg1 as well, i.e., dedicated preamble for a certain SRS configuration.

CATT prefer to follow the legacy mechanism for SRS activation, with a MAC CE for SP/AP-SRS.

Ericsson wonder if we could have the assumption that there is only one SRS resource configuration for a validity area.

Xiaomi understand the preconfigured SRS is not the same as SRS with validity area, and the UE may need permission from the gNB to transmit, but we do not have agreements on the preconfigured SRS and they are not sure how it works.

Intel think this issue is also related to the area-based TA; we discussed whether the UE should release the configuration when the area-based TA expires; their understanding is that the UE cannot send the activation after this event.

ZTE acknowledge Xiaomi’s understanding that there is a difference between the features; they want to know if the activation request is needed for the SRS with validity area case. Chair understands they can work together.

Huawei think the preconfiguration is important for LPHAP, because it saves signalling overhead and avoids the requirement to signal the configuration on the fly. They agree with Intel and think the activation request goes hand in hand with preconfiguration.

vivo think RAN1 and RAN2 have different understanding of preconfiguration; in the TR, RAN1 indicated that the activation is from the network via paging, and they think maybe we can achieve the objective with SP-SRS. They think preconfiguration does not save signalling, because the UE still needs to indicate to the network which SRS it will use. Qualcomm think this issue is a step ahead, and SP-SRS does not quite match preconfigured SRS; this is the request from the UE to the gNB.

OPPO think the UE does not need permission and can transmit autonomously once the SRS for a validity area is configured. Ericsson think the network needs to know to listen when the UE will transmit.

Ericsson doubt the signalling overhead reduction, but if we have the feature, they agree we will need the activation request.

Fraunhofer wonder if the configuration is UE-specific or common to a group of UEs, and whether the network can continuously process the transmission or needs to know when it is sent. They think continuous reception could be valid for a short period of time.

CATT think OPPO and ZTE put a precondition on the proposal that the period of the SRS is equal to the reporting period; CATT doubt that this will always be the case.

Intel agree with Ericsson that we should avoid continuous monitoring by the network, so they think an indication is needed. They distinguish between configuration request and activation request. To Fraunhofer’s question, they understand that it has to be UE-specific to avoid collisions. They have no strong view but somewhat doubt the value of the activation request, as opposed to a transmission indication with the control at the UE.

Xiaomi agree that the request is needed, but they wonder what the benefit is from a UE power saving perspective since the UE needs to exchange the signalling.

Sony understand we are assuming there is a preconfigured SRS, and we are discussing whether and how the UE is triggered to transmit it. They think using Msg3/MsgA saves power compared to transitioning to connected mode for signalling.

OPPO think we could let the LMF inform the gNBs when the UE approaches the validity area of a configuration.

Huawei think the proposal is aligned with what we have been discussing; we analysed the value of preconfiguration in the SI.

Agreement:

RAN2 will introduce an activation indication and/or request for preconfigured SRS using at least Msg3/MsgA; FFS if Msg1 would be supported also. FFS RRC signalling or MAC CE for the Msg3/MsgA case, as for the configuration request. This agreement does not imply that the UE will be allowed to transmit autonomously.

Proposal 10: Strive for a unified design for the "SRS configuration request" and "SRS activation request" messages.

SRS Request Message

Proposal 11: For the "SRS configuration request" and/or (depending on Proposal 9/10) "SRS activation request", select one of the following options:

- new resume cause;

- new RRC message;

- new MAC CE;

- via RACH procedure.

Proposal 12: Before deciding on the options in Proposal 11, RAN2 should first agree on the information required/contained in the "SRS configuration request" and/or (depending on Proposal 9/10) "SRS activation request".

SRS activation by gNB

Proposal 13: To activate a pre-configured SRS for positioning, define a gNB triggered message.

Signalling between NG-RAN and LMF

Proposal 14a: Define a NRPPa message for the coordination of SRS configurations between gNBs and LMF.

Proposal 14b: Define a NRPPa message to provide updated SRS configuration to the LMF when receiving the request from the UE.

Proposal 14c: Define a NRPPa message to provide the updated SRS configuration to the measured TRPs.

Proposal 14d: Define a NRPPa message to enable an LMF to request SRS deactivation.

NOTE: The NRPPa message(s) above may be existing NRPPa message(s) and/or new NRPPa message(s) depending on RAN3.

DL PRS measurements for a UE in RRC\_IDLE state:

Proposal 15: Send an LS to SA2 to inform them that RAN2 has agreed to support "DL PRS measurements for a UE in RRC\_IDLE state and reporting of the measurements in RRC\_CONNECTED state" and ask SA2 whether there are any impacts to the LCS procedures in SA2 specifications, and if so, request SA2 to consider the RAN2 agreement for updating the SA2 specifications.

Discussion:

Intel think we should send an LS to SA2 to trigger them to check for impact.

CATT think we could clarify that the measurements cover Rel-16/17/18.

Nokia wonder if there is a rush and would rather see baseline running CRs.

Huawei think RAN1 will figure out the measurements and RAN4 will lay out the requirements; they think the differences between AS measurements are not important to SA2.

* [AT122][422][POS] LS to SA2 on reporting positioning measurements taken in RRC\_IDLE (CATT)

Scope: Draft an LS to SA2 indicating that from RAN2 perspective, reporting in RRC\_CONNECTED of measurements taken in RRC\_IDLE is feasible, and asking them to check for impact to their specs.

Intended outcome: Approvable LS in R2-2306695

Deadline: Thursday 2023-05-25 2000 KST

Alignment between eDRX and PRS:

Proposal 16: "eDRX" in the objective "Specify solutions for alignment between eDRX and PRS configurations [RAN2]" refers to the idle and inactive eDRX configuration.

Proposal 17: For the DL-PRS alignment with configured/fixed eDRX, the UE-initiated on-demand DL-PRS procedures are used.

Discussion:

ZTE think normal DRX without extension can be in scope and the lack of DRX is a mistake in the WID; they think it should say “[e]DRX”.

Intel think it doesn’t matter whether it is DRX or eDRX if we take P17. Ericsson agree.

Huawei think the question is mainly about C-DRX. Sony think we only discuss idle/inactive DRX.

CATT think we can include both DRX and eDRX, but only for idle/inactive. On P17, they disagree because if the UE initiates on-demand, it will result in additional power consumption, and if the gNB and LMF align the DRX cycle with PRS there is no cost to the UE.

ZTE think the difference between DRX and eDRX is significant because of the paging window. On CATT’s comment, they understand that CATT are thinking of the LMF-initiated OD-PRS procedure.

Nokia think P17 looks only at a UE-controlled mechanism, and they think a network-controlled option should also be there. Ericsson agree with Nokia, and they see spec impact also for P17 because the UE would need to inform the network what cycle to match.

Qualcomm agree with ZTE that DRX and eDRX are different, which is the motivation for P16; they understand that the focus on eDRX is intentional and aligned with the RAN1 SI outcomes. They think it is clear that P17 is valid even if not the only solution.

Xiaomi agree with CATT that we should support an LMF-initiated mechanism.

OPPO think we should study the spec impact before agreeing to this.

Lenovo think the LMF-initiated case should be supported, and the UE may need to share its DRX configuration to the LMF.

ZTE think the LMF-initiated version will not work because eDRX is cell-specific and the LMF does not know where the UE is.

Intel note that the gNB can know the LPHAP indication, so they do not see the LMF-initiated version as necessary.

R2-2306700 (LS from [415]) Huawei, HiSilicon LS out Rel-18 To:RAN1,RAN3,RAN4

R2-2306695 (LS from [422]) CATT LS out Rel-18 To:SA2

The following tdocs will not be individually treated

[R2-2304772](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304772%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP CATT discussion Rel-18 NR\_pos\_enh2

[R2-2304799](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304799%20Discussion%20on%20LPHAP_final.docx) Discussion on LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2304887](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304887%20PRS%20and%20DRX%20configuration%20alignment.docx) PRS and DRX configuration alignment Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core R2-2304059

[R2-2304950](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304950_LPHAP_Fraunhofer.docx) Enhancements for supporting LPHAP Fraunhofer IIS, Fraunhofer HHI discussion R2-2302589

[R2-2305069](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305069-PRS-DRX-alignment-v0.docx) Alignment between DRX and PRS Apple discussion Rel-18 NR\_pos\_enh2

[R2-2305333](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305333%20Discussion%20on%20solution%20of%20LPHAP.doc) Discussion on solution of LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2305342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305342%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2305442](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305442.docx) Further considerations on LPHAP Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2305510](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305510_LPHAP.docx) Considerations on Low Power High Accuracy Positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2305564](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305564%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Spreadtrum Communications discussion Rel-18

[R2-2305637](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305637%20Considerations on LPHAP.doc) Considerations on LPHAP CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2305644](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305644%20(R18%20NR%20POS%20A724%20LPHAP).doc) Discussion on LPHAP InterDigital, Inc. discussion Rel-18

[R2-2305669](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305669%20Discussion%20on%20LPHA%20positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2305710](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305710%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2305822](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305822_(LPHAP).docx) Enhancements for LPHAP Qualcomm Incorporated discussion

[R2-2306021](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306021%20LPHAP.docx) Discussion on Low Power High Accuracy Positioning Ericsson discussion Rel-18

[R2-2306075](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306075%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2306447](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306447_Discussion%20on%20SRS%20configuration%20in%20RRC_INACTIVE.docx) Discussion on SRS configuration in RRC\_INACTIVE Samsung discussion Rel-18 FS\_NR\_pos\_enh2

### 7.2.5 RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning

RAN1 led objectives that may require progress in RAN1 before RAN2 can take decisions. This agenda item will be treated at lower priority.

[R2-2306077](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306077%20Discussion%20on%20BW%20aggregation%20and%20RedCap%20positioning.docx) Discussion on BW aggregation and RedCap positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

For bandwidth aggregation:

Proposal 1: For UE-initiated on-demand PRS request for PRS bandwidth aggregation, support

• On-demand PRS configuration can include the group information where the linked on-demand PRS configuration IDs are in the same group for aggregation

• UE can request on-demand PRS configuration ID(s) or group ID(s)

• UE can request PRS bandwidth larger than that of a single PFL implying PRS bandwidth aggregation request

Proposal 2: For LMF-initiated on-demand PRS request for PRS bandwidth aggregation, support

• LMF can request PRS bandwidth larger than that of a single PFL implying PRS bandwidth aggregation request

• Send an LS to RAN3

Proposal 3: To support two or three carrier aggregation of positioning SRS transmission for UE in RRC inactive mode, introduce one or two NUL carriers with respective SRS configuration, where the newly introduced carrier(s) and the carrier of the initial BWP are intra-band NUL contiguous carriers.

Proposal 4: For positioning SRS bandwidth aggregation in RRC\_CONNECTED state which can be decoupled from communication CA, support to introduce a new UE capability BandCombinationList-PosCA-r18.

For RedCap:

Proposal 5: RedCap UE can use on-demand PRS procedure to request Rx PRS hopping without additional specification impact in RAN2, i,e., if UE requests a PRS bandwidth larger than its UE capability, it implies UE requests a Rx PRS hopping.

Proposal 6: For Rx PRS hopping, support to introduce one or more of the following parameters per PRS resource in the DL-PRS configuration in the assistance data:

 Number of hops

 Number of overlapped RB between hops

 Total bandwidth of all hops

Proposal 7: RedCap UE should report the corresponding hop indication for each measurement result, wherein the hop indication includes the frequency range.

Proposal 8: Support to configure a new SRS configuration within the legacy SRS-Config IE to indicate SRS hopping for RedCap UE.

[R2-2304773](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304773%20Discussion%20on%20carrier%20phase%20positioning%20bandwidth%20aggregation%20for%20positioning%20and%20Redcap%20positioning.docx) Discussion on carrier phase positioning, bandwidth aggregation for positioning and Redcap positioning CATT discussion Rel-18 NR\_pos\_enh2

[Chair’s note: omitting “wait for RAN1” proposals]

NR DL and UL carrier phase positioning aspect:

Proposal 1: The measurements on CPP performed by UE and TRP can be reported to LMF via LPP and NRPPa messages following the legacy procedure, including:

- DL RSCP which can be reported together with UE Rx – Tx time difference measurement

- DL RSCPD which can be reported together with RSTD measurement

- UL RSCP together with RTOA and/or gNB Rx-Tx time difference measurements to LMF

FFS standalone DL RSCP and/or DL RSCPD reporting, and standalone UL carrier phase measurements reporting in RAN1 at first.

Bandwidth aggregation for positioning measurements aspect:

Proposal 4: RAN2 to discuss the enhancement of LPP messages to support PRS resources aggregated across PFLs for DL-TDOA and multi-RTT positioning methods at least including the following aspects:

- adding PFL aggregation indication in the LPP ProvideLocationInformation message for DL-TDOA and multi-RTT positioning methods.

- adding joint measurement indication in the LPP RequestLocationInformation message for DL-TDOA and multi-RTT positioning methods.

- introducing new UE capabilities in the LPP ProvideCapabilities message for DL-TDOA and multi-RTT positioning methods. Wait for RAN1 progress to specify the details.

Positioning for RedCap UEs aspect:

Proposal 8: The legacy LPP capability procedure shall be reused to provide the information on RedCap UE capability from the UE to the LMF.

[R2-2305315](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305315%20Discussion%20on%20RAN1%20led%20positioning%20topics.docx) Discussion on RAN1 led positioning topics Huawei, HiSilicon discussion Rel-18

[R2-2305334](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305334%20on-demand%20PRS%20for%20PRS%20bandwidth%20aggregation.docx) on-demand PRS for PRS bandwidth aggregation vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2305443](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305443.docx) Considerations on other RAN1 led items Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2305625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305625.docx) Discussion on the RedCap UE positioning CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2305645](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305645%20(R18%20NR%20POS%20A725%20Others).docx) Discussion on positioning for RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning InterDigital, Inc. discussion Rel-18

[R2-2305670](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305670%20Discussion%20on%20RedCap%20UE%20positioning.doc) Discussion on RedCap UE positioning Xiaomi discussion

[R2-2306023](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306023%20RedCap.docx) RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning Ericsson discussion Rel-18

[R2-2306448](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306448_Discussion%20on%20bandwidth%20aggregation.docx) Discussion on bandwidth aggregation Samsung discussion Rel-18 FS\_NR\_pos\_enh2

## 7.9 Enhanced NR Sidelink Relay

(NR\_SL\_relay\_enh-Core; leading WG: RAN2; REL-18; WID: RP-223501)

Time budget: 1.5 TU

Tdoc Limitation: 4 tdocs

### 7.9.1 Organizational

Including incoming LSs and rapporteur inputs.

Incoming LSs with “take into account” actions

[R2-2304617](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304617_R1-2304211.docx) Reply LS on comparison of SL-RSRP and SD-RSRP measurements (R1-2304211; contact: Nokia) RAN1 LS in Rel-18 NR\_SL\_relay\_enh-Core To:RAN2 Cc:RAN4

* Noted

[R2-2304637](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304637_R4-2306366.docx) LS on Comparison of SL-RSRP and SD-RSRP measurements (R4-2306366; contact: Nokia) RAN4 LS in Rel-18 NR\_SL\_relay\_enh To:RAN2 Cc:RAN1

* Noted

Other incoming LSs

[R2-2304646](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304646_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

* Handled under UE-to-UE

[R2-2304652](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304652_S2-2305915.doc) Reply LS on 5G ProSe Layer-2 UE-to-UE Relay QoS enforcement (S2-2305915; contact: Qualcomm) SA2 LS in Rel-18 5G\_ProSe\_Ph2 To:RAN2

* Postponed

Draft CR

[R2-2305207](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305207-Draft%20running%20CR%2038.300.docx) Draft running CR 38.300 (initial) LG Electronics France draftCR Rel-18 38.300 17.4.0 B NR\_SL\_relay-Core

* Revised in R2-2306554

Discussion:

Ericsson and Nokia would prefer to note the CR rather than try to endorse it at this meeting. LG think it would be more productive to receive comments in an email discussion.

LG clarify that this CR does not include multi-path aspects.

* [AT122][416][Relay] Rel-18 relay CR to 38.300 (LG)

Scope: Collect comments on the draft CR in R2-2305207 and produce a revision.

Intended outcome: Revised CR in R2-2306554

Deadline: Thursday 2023-05-25 2000 KST

R2-2306554 Draft running CR 38.300 (update) LG Electronics France draftCR Rel-18 38.300 17.4.0 Bz NR\_SL\_relay-Core

Withdrawn/Not available

R2-2305208 Draft running CR 38.300 (update) LG Electronics France draftCR Rel-18 38.300 17.4.0 Bz NR\_SL\_relay-Core

* Withdrawn

### 7.9.2 UE-to-UE relay

Single-hop Layer-2 and Layer-3 UE-to-UE relay for unicast. Including common L2/L3 functionality comprising relay discovery and (re)selection and L2-specific functionality including adaptation layer design, control plane procedures, and QoS handling if needed.

Agenda item summary

[R2-2306555](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306555%20Summary%20of%20AI%207.9.2%20on%20U2U%20relay.docx) Summary of AI 7.9.2 on UE-to-UE relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[Easy proposal]

Discovery

[Easy] Proposal 2a: For Model A discovery, the relay UE should only announce the neighbour UEs for which the PC5 link quality between the relay UE and the neighbour UE is above a certain threshold in a discovery announcement message. If agreed, LS is sent to SA2.

[Easy] Proposal 2b: For Model A discovery, upon discovery message reception, remote UE considers a relay UE as a candidate relay UE only if the PC5 RSRP towards the relay UE is above a configured threshold.

[Easy] Proposal 3c: For Model B discovery, upon discovery response messages reception, the source remote UE considers a relay UE as a candidate relay UE only if the PC5 RSRP towards the relay UE is above a configured threshold.

[Easy] Proposal 4: For integrated-discovery, when receiving DCR message from one or multiple relay UEs, the target remote UE should select a relay UE towards which the PC5 RSRP is above a configured threshold to respond.

[Easy] Proposal 5a: For U2U relay, when relay (re)selection is triggered, the discovery procedure is triggered at the same time to search for candidate relay UEs.

Discussion:

ZTE indicate that “only” might be removed from P2b and P3c.

Apple think PC5 RSRP should be SD-RSRP since we talk about discovery messages.

NEC think we should keep the term “neighbour UE” aligned across specs.

Apple think the last proposal refers only to the source remote UE.

Qualcomm wonder if the threshold in the first two proposals should be the same as for relay (re)selection.

Huawei wonder which discovery procedure is triggered in the last proposal.

ZTE indicate that in LTE we used the same thresholds for discovery and (re)selection, but in NR there was some thought that they could be different. To Huawei’s question, they think the related discovery procedure is model B, because the monitoring behaviour for model A would not be specified.

Xiaomi think Apple’s comment on the last proposal is relevant, and it should be both source and target remote UEs. Apple clarify that P4 implies the target remote UE will just select a relay UE without a discovery procedure, and P5 says it should trigger a discovery procedure; they understand that integrated discovery should have no triggering of a separate discovery procedure.

InterDigital think P5 is not applicable to integrated discovery..

OPPO think we could add “without specifying separate AS criteria explicitly” to the last proposal.

Agreements:

For Model A discovery, the relay UE should only announce the neighbour UEs for which the SD-RSRP/SL-RSRP between the relay UE and the neighbour UE is above a configured threshold in a discovery announcement message. LS is sent to SA2.

For Model A discovery, upon discovery message reception, remote UE considers a relay UE as a candidate relay UE if the SD-RSRP towards the relay UE is above a configured threshold.

For Model B discovery, upon discovery response messages reception, the source remote UE considers a relay UE as a candidate relay UE if the SD-RSRP towards the relay UE is above a configured threshold.

For integrated-discovery, when receiving DCR message from one or multiple relay UEs, the target remote UE should consider candidate relay UEs towards which the SL-RSRP is above a configured threshold to respond and that satisfy upper-layer criteria, and select a relay UE from among them.

For non-integrated U2U relay discovery model B, when relay (re)selection is triggered at the remote UE, the discovery transmission may be triggered at the same time to search for candidate relay UEs.

* [AT122][417][Relay] LS to SA2 on announcement of neighbour UEs (ZTE)

Scope: Draft an LS to SA2 indicating the agreement:

For Model A discovery, the relay UE should only announce the neighbour UEs for which the PC5 link quality between the relay UE and the neighbour UE is above a certain threshold in a discovery announcement message.

Intended outcome: Approvable LS in R2-2306697

Deadline: Thursday 2023-05-25 2000 KST

Relay (re)selection

[Easy] Proposal 8: Different thresholds for SL-RSRP and SD-RSRP are configured for the trigger of U2U relay (re)selection.

[Easy] Proposal 12a: Besides the PC5 link quality, RAN2 does not pursue other criteria for relay (re)selection.

[Easy] Proposal 12b: If multiple suitable U2U relay candidates which meet both the AS-layer and higher layer criteria are available, it is up to remote UE implementation to choose a U2U relay UE.

Discussion:

NEC understand P8 is only for non-integrated. ZTE indicate they did not differentiate.

LG wonder if the Rel-17 UE will differentiate the SL-RSRP and SD-RSRP thresholds in P8.

InterDigital agree with NEC, and they think the Rel-17 UE is not a problem.

Qualcomm have the same concern as LG: In Rel-17 U2N, we had only one threshold for SL-RSRP and SD-RSRP, and they do not see why we change here.

Huawei are OK with the proposals.

Xiaomi wonder on P12a about the relationship with P9; are they compatible? They think P12b should be taken with P10 to consider the relationship with the second link.

ZTE clarify that P12a was intended to exclude load.

Qualcomm think the last proposal has a potential clash with SA2 agreements; they think it is out of RAN2 scope. NEC think it reuses the principle from Rel-17 U2N.

Xiaomi wonder if the last proposal excludes discussion of enhanced information from AS to upper layer to assist (re)selection.

Ericsson understand that we have upper-layer and AS criteria, and a relay UE that meets both criteria will be chosen, as in Rel-17 U2N; inter-layer information can be discussed.

MediaTek think the second item should say “other AS criteria”.

Qualcomm think the last item interferes with SA2 (re)selection between remote UEs. CATT have the same concern.

Apple think the upper-layer coordination between two remote UEs is not feasible without a direct link.

InterDigital think the coordination is not related to the selection criteria but to which UE does the selection.

Agreements:

Separate thresholds for SL-RSRP and SD-RSRP are configured for the trigger of U2U relay (re)selection.

Besides the PC5 link quality, RAN2 does not pursue other AS criteria for relay (re)selection.

SRAP design

[Easy] Proposal 15: If 24-bit L2 ID is agreed, Option 3 (both source remote UE 24-bit layer-2 ID and target remote UE 24-bit layer-2 ID included in each hop) should be supported.

[Easy] Proposal 16b: If short ID is agreed, relay UE is responsible for ID assignment.

[Easy] Proposal 17a: Confirm the WA with following change: E2E bearer ID (i.e., slrb-PC5-ConfigIndex in the list of SLRB configurations for SL-DRBs, and specified values 0/1/2/3 for SL-SRB0/1/2/3) is used as input for the L2 U2U relay ciphering and deciphering at PDCP.

Discussion:

NEC think P15 and P16b could be set as WAs, and we confirm one based on what we decide next meeting.

Xiaomi see a bit of a contradiction between P15 and P16b and think we need to decide which ID first. Samsung agree and think we should not take WAs now.

LG do not support option 3 because of efficiency.

Huawei think we should discuss P14 first.

SL-SRB/DRB and PC5 RLC channel configuration

[Easy] Proposal 18: For the E2E SL-SRB configuration of U2U relay, specified PDCP configuration is used. FFS for the SRAP and PC5 RLC channel configuration for SL-SRB.

[Easy] Proposal 19a: AS layer is responsible for QoS split in L2 U2U relay.

[Easy] Proposal 19b: Relay UE is responsible for AS layer QoS split in L2 U2U relay.

[Easy] Proposal 20a: For OOC U2U relay/remote UE, pre-configuration is used for the SL-DRB and PC5 RLC channel configuration.

[Easy] Proposal 20b: For RRC\_IDLE/INACTIVE U2U relay/remote UE, SIB is used for the SL-DRB and PC5 RLC channel configuration.

Discussion:

Qualcomm are OK with P19a but wonder which message we should use. For P20b, they think we need to provide e2e and per-hop configuration, so we need to enhance the existing behaviour.

Ericsson think Qualcomm’s questions are beyond the proposal, but for P20b they do not think we are breaking a Rel-16 principle.

Apple wonder if P20b refers to e2e SL DRB. ZTE confirm it does.

NEC wonder how we ensure that remote and relay UE under different cells will have the same SIB configuration. OPPO understand it is network responsibility.

OPPO are generally fine with the QoS split in AS, but they understand SA2 have already defined a solution and they would like guidance that we use it.

Ericsson understand SA2 left the QoS split up to RAN2. InterDigital agree.

Agreements:

For the E2E SL-SRB configuration of U2U relay, specified PDCP configuration is used. FFS for the SRAP and PC5 RLC channel configuration for SL-SRB.

AS layer is responsible for QoS split in L2 U2U relay.

Relay UE is responsible for AS layer QoS split in L2 U2U relay.

For OOC U2U relay/remote UE, pre-configuration is used for the E2E SL-DRB and per-hop PC5 RLC channel configuration.

For RRC\_IDLE/INACTIVE U2U relay/remote UE, SIB is used for the E2E SL-DRB and per-hop PC5 RLC channel configuration.

[To Discuss]

Authorization

[ToDis] Proposal 1: Authorization information is needed for L2 U2U relay operation. RAN2 to discuss whether it is needed for L3 U2U relay operation. Send reply LS to inform SA2.

Discussion:

Qualcomm think authorisation is needed if the gNB needs to provide a dedicated configuration to the UE, but we have not decided on that. For L3, they think we can reuse existing authorisation.

Apple think if discovery needs authorisation, there is no difference between L2 and L3. They suggest that it would be simple to reuse the existing ProSe authorisation.

NEC have a similar understanding to Apple.

ZTE note we agreed mode 1 RA can be used, so the gNB has to be responsible for the LCG configuration; they understand that the gNB then should know if the configuration is for relay or remote UE. Samsung agree with ZTE.

Apple think mode 1 applies to both L2 and L3, and they do not see different behaviour to schedule relay and remote UEs. ZTE clarify that the point is that L2 relay and remote UEs have different configurations, but for L3 both hops are configured with all layers.

Qualcomm agree with Apple regarding mode 1, but regarding ZTE’s comments, they think we have not discussed this and could leave it FFS.

Ericsson have a similar understanding to Qualcomm. They think we could have additional authorisation independent of L2/L3.

NEC see the issue as related to how the UE gets the configuration from the gNB, and they do not see a need to differentiate the authorisation mechanism, but maybe we should discuss configuration first.

LG think we cannot delay the decision. Their understanding is that authorisation is not related to the dedicated configuration, and there is no big difference between the existing mechanism and a new one.

* [AT122][418][Relay] Authorisation for U2U relay (ZTE)

Scope: Discuss the issue of authorisation for L2 and L3 U2U relay and determine if something beyond the existing ProSe authorisation is needed. Draft a reply LS to SA2.

Intended outcome: Report to CB session in R2-2306690 and approvable LS in R2-2306691

Deadline: Thursday 2023-05-25 2000 KST

Discovery

[ToDis] Proposal 3a: For Model B discovery, the source remote UE transmits discovery solicitation message when the PC5 link quality (SL-RSRP or SD-RSRP) between the source remote UE and the target remote UE (if available) is below a configured threshold.

[ToDis] Proposal 3b: For Model B discovery, the relay UE transmits discovery solicitation message to target remote UE only if the PC5 link quality between the relay UE and the source remote UE is above a configured threshold.

[ToDis] Proposal 6: For RRC\_CONNECTED U2U relay/remote UE, U2U relay, dedicated signalling is used for the discovery configuration.

Relay (re)selection

[ToDis] Proposal 9: Remote UE can trigger U2U relay selection when PC5 RLF of the direct link between the remote UE and the peer remote UE is detected.

[ToDis] Proposal 10: Remote UE can trigger relay reselection if the link quality of the second hop between the relay UE and peer remote UE is blow a threshold even the link quality of the first hop is good. FFS for the content of the link quality indication of the second hop.

[ToDis] Proposal 11: RAN2 to discuss whether AS criterion is needed for switching back from indirect to direct link.

[ToDis] Proposal 13: RAN2 to discuss whether/how to handle the case that remote UE and its peer remote UE may select two different relay UEs simultaneously for communicating with each other. Send LS to SA2 if necessary .

SRAP design

[ToDis] Proposal 14: RAN2 to discuss which ID (24-bit L2 ID or short ID) can be used in SRAP header.

Discussion:

Qualcomm think it depends on whether multihop needs to be considered. Chair understands the WID instructs us to consider forward compatibility.

Xiaomi think we had a similar discussion in the SI, and we have to consider it without designing it in detail.

LG agree that we need to consider the multihop case, but they think a short ID can be used with multihop.

Nokia agree that the multihop case should not be decisive. Huawei agree.

vivo agree with Xiaomi that we have to consider multihop with the next release in mind.

OPPO think we should keep multihop in mind, and so they think we need to design a forward-compatible solution.

Ericsson are not sure why one solution would work better than the other for multihop. They are concerned about overhead. Qualcomm also are concerned that the L2ID is too large, and they think the requirement to update L2ID frequently would be disruptive.

Samsung think there is no clear majority but a lot of things depend on the decision.

Xiaomi think the long ID will create intractable problems like the scalability over multiple hops, and the issues with the short ID may be more manageable. So they would prefer to start from the short ID and move forward from there.

Ericsson think if we use L2ID in multihop, one broken link can cause reconfiguration of the whole path.

LG think multihop is not a very serious concern for this issue.

* [AT122][419][Relay] Short ID in U2U relay (Ericsson)

Scope: Discuss P16a of R2-2306555, considering issues of ID collision and future applicability to multihop, and attempt to converge on a way forward. F2F offline to be arranged Wednesday 2023-05-24 afternoon in Brk3.

Intended outcome: Report to CB session in R2-2306692

Deadline: Wednesday 2023-05-24 2000 KST

[ToDis] Proposal 16a: If short ID is agreed, RAN2 to discuss which option should be supported.

Option 2: Target remote UE ID (local ID) in first hop and source remote UE ID (local ID) in second hop.

Option 4: Both source remote UE ID (local ID) and target remote UE ID (local ID) included in each hop, the local ID is same on each hop and relay UE does not replace the local ID on each hop.

Option 5: A local pair ID for a pair between source remote UE and target remote UE included in each hop, the local ID is unique within one PC5 hop and relay UE needs to replace the local ID on each hop.

Option 6: A local pair ID for a pair between source remote UE and target remote UE included in each hop, the local ID is same on each hop and relay UE does not replace the local ID on each hop.

[ToDis] Proposal 17b: RAN2 to discuss how to identify the E2E bearer ID(e.g. 0/1/2/3) included in SRAP header is for SL-SRB or SL-DRB.

SL-SRB/DRB and PC5 RLC channel configuration

[ToDis] Proposal 20c: For RRC\_CONNECTED U2U relay/remote UE, dedicated signalling is used for the SL-DRB and PC5 RLC channel configuration.

[Low priority]

[LowPriority] Proposal 7: RAN2 deprioritize the discussion of U2N relay and U2U relay co-existence.

[LowPriority] Proposal 5b: RAN2 to discuss whether remote UE can perform Model B discovery while relay (re)selection is not triggered.

R2-2306697 (LS from [417]) ZTE LS out Rel-18 To:SA2

R2-2306690 (Report of [418]) ZTE discussion Rel-18

R2-2306691 (LS from [418]) ZTE LS out Rel-18 To:SA2

[R2-2306692](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306692_%5bAT122%5d%5b419%5d%5bRelay%5d%20Short%20ID%20in%20U2U%20relay%20(Ericsson).docx) [AT122][419][Relay] Short ID in U2U relay (Ericsson) Ericsson discussion Rel-18

Proposal 1 RAN2 to down select between the following options for identifying the source and destination remote UEs at the SRAP layer:

a) Single ID, identifying the source and destination remote UEs

b) Source ID and Destination ID

Proposal 2 At least for single hop U2U relaying, the U2U relay performs the ID assignment. FFS if this ID should be assigned hop-by-hop or global (in the context of a single hop U2U relay).

Proposal 3 Whether the ID used in P1/P2 is the short ID.

Discussion:

Apple wonder about the intention of P3. Ericsson clarify that it is to frame the question and compare the IDs on a common baseline.

On P2, Xiaomi understand that only single-hop is in scope.

Qualcomm understand that “hop-by-hop” means the IDs could be different on each hop. Xiaomi have a similar concern. Ericsson note that it is an FFS and we should not wordsmith too much.

Apple understood that “globally” means a centralised allocation mechanism, so there is no collision at least with nearby UEs.

LG think there is something to clarify, but they understand that even if there is a collision in the short ID, the UEs will have different L2IDs that may disambiguate it. Apple think there could be issues in the multihop case in future. Qualcomm think this is part of the reason for the FFS.

Agreements:

For the possible use of a short ID in U2U relay, RAN2 will downselect between the following options for identifying the source and destination remote UEs at the SRAP layer:

a) Single ID, identifying the source and destination remote UEs

b) Source ID and Destination ID

For the possible use of a short ID in U2U relay, the U2U relay UE performs the ID assignment. FFS if this ID should be assigned hop-by-hop or globally.

These agreements do not imply agreement to use a short ID.

The following tdocs will not be individually treated

[R2-2304680](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304680%20SRAP%20design%20and%20Connection%20establishment.docx) SRAP design and Connection establishment NEC discussion NR\_SL\_relay\_enh-Core

[R2-2304754](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304754%20-%20Discussion%20on%20U2U%20Relay.docx) Discussion on U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304957](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304957%20Discussion%20on%20the%20adaptation%20layer_v2.doc) Discussion on the adaptation layer Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305043](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305043%20Further%20discussion%20on%20U2U%20Relay.doc) Further discussion on U2U Relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305062](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305062%20Discussion%20on%20U2U%20relay%20issues.doc) Discussion on UE-to-UE Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305180](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305180%20(R18%20SL%20Relay%20WI_AI792%20RelayDiscoverySelection).doc) Discovery and Relay Selection for UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305181](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305181%20(R18%20SL%20Relay%20WI_AI792%20U2U%20Relays).doc) QoS and Adaptation Layer for UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305210](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305210-Control%20plane%20procedure%20and%20adaptaion%20layer%20for%20U2U%20relay.docx) Control plane procedure and adaptaion layer for U2U relay LG Electronics France discussion Rel-18

[R2-2305233](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305233+Discussion%20on%20NR%20sidelink%20U2U%20relay.doc) Discussion on U2U sidelink relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305245](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305245_Discussion%20on%20the%20common%20L2%20L3%20parts%20for%20U2U%20relaying.docx) Discussion on the common L2 L3 parts for U2U relaying vivo discussion

[R2-2305246](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305246_%20Discussion%20on%20the%20L2%20specific%20parts%20for%20U2U%20relaying.docx) Discussion on the L2 specific parts for U2U relaying vivo discussion

[R2-2305279](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305279%20Disussion%20on%20U2U%20Relay.docx) Discussion on U2U Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305519](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305519.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2305520](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305520%20Relay_DRX.docx) Discussion on DRX for Sidelink UE to UE Relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2305547](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305547_Discussion_on_Relay_reselection_Discovery.docx) Discussion on Relay (re)selection and Discovery Ericsson España S.A. discussion Rel-18

[R2-2305548](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305548_Control_Plane_Procedures_for_L2_U2U_relays.docx) Control Plane Procedures for Layer 2 UE-to-UE Relays Ericsson España S.A. discussion Rel-18

[R2-2305551](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305551.doc) Discussion on UE-to-UE relay Spreadtrum Communications discussion Rel-18

[R2-2305590](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305590%20Further%20issues%20on%20U2U%20relay.docx) Considerations on U2U relay (re)selection and Local ID assignment Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core R2-2302791

[R2-2305618](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305618%20Discussion%20on%20U2U%20relay.docx) Discussion on U2U relay CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305697](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305697%20Discussion%20on%20L2%20U2U%20relay%20v1.0.docx) Discussion on L2 U2U relay Lenovo discussion Rel-18

[R2-2305743](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305743%20QoS%20split%20and%20Bearer%20configuration.doc) QoS split and Bearer configuration Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305762](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305762-Layer-2%20specific%20part%20on%20U2U%20Relay.docx) Layer-2 specific part on U2U Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2305763](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305763-gNB%20involvement%20on%20U2U%20relay.docx) gNB involvement on U2U relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2305802](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305802%20SRAP%20design%20for%20U2U%20sidelink%20relay.doc) SRAP design for U2U Sidelink Relay Samsung R&D Institute UK discussion

[R2-2305874](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305874_U2U_relay.docx) Considerations for U2U L2 relay operations Kyocera discussion

[R2-2306125](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306125%20Discussion%20on%20aspects%20of%20AS%20layer%20configuration%20for%20L2%20U2U%20Relay.docx) Discussion on aspects of AS layer configuration for L2 U2U Relay ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306126](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306126%20Discussion%20on%20E2E%20PC5-RRC%20configurations.docx) Discussion on E2E PC5-RRC configurations ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306191](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306191%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306378](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306378%20Discussion%20on%20L2%20U2U%20Relay%20v01.docx) Discussion on L2 U2U Relay MediaTek Inc. discussion Rel-18

[R2-2306380](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306380-U2U.doc) Remaining issues for U2U relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306427%20-%20U2U%20relay.docx) U2U Relay UE discovery / (re)selection, SRAP, QoS Handling Beijing Xiaomi Mobile Software discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.3 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.

Agenda item summary

[R2-2306559](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306559%20Summary%20of%20AI%207.9.3%20on%20service%20continuity.docx) Summary of AI 7.9.3 on service continuity (vivo) vivo discussion

[Easy]

Proposal 6 [Easy] RAN2 to revise the original proposal 4 agreed for i2i scenario as “Proposal 4 (modified) For i2i scenario, for serving U2N relay UEs, when SL-RSRP is unavailable, SD-RSRP is used as the measurement quantity. And for candidate U2N relay UEs, only SD-RSRP is used as the measurement quantity.”

Proposal 7 [Easy] RAN2 to agree that measurement event Z2 (i.e., Candidate L2 U2N Relay UE becomes an offset better than serving L2 U2N Relay UE) is not introduced.

Discussion:

Huawei think although RAN1/RAN4 indicated that there are issues with the comparison, it should still be possible.

Apple understand that RAN1 indicated there are issues, and we cannot determine it is feasible without knowing what all the issues are.

Samsung understand that the LS spoke to direct comparison, but they did not speak to whether using both in the same measurement entity is feasible.

InterDigital agree with Samsung and note that in Rel-17 we have a single threshold for SD-RSRP and SL-RSRP measurements, so there is an implicit comparison.

LG support P7; the reason we sent the LS was to determine if event Z2 would be introduced.

Xiaomi agree that the LS only applied to the comparison between SL-RSRP and SD-RSRP; they think we could restrict the event to using the same measurement quantity.

vivo point out that P6 is not dependent on the RAN1/RAN4 LS.

Agreements:

The previous agreement from RAN2#119bis-e is revised as follows: For i2i scenario, for serving U2N relay UEs, when SL-RSRP is unavailable, SD-RSRP is used as the measurement quantity. And for candidate U2N relay UEs, only SD-RSRP is used as the measurement quantity.”

Measurement event Z2 (i.e., Candidate L2 U2N Relay UE becomes an offset better than serving L2 U2N Relay UE) is not introduced

[For discussion]

Proposal 1 [For discussion] For uplink lossless data delivery for path switch, RAN2 to conclude whether to agree on solution U5 only, solution U3 only or both solutions, by taking into account of the identified technical concerns of U3 and U5 as shown in Table 1.

Proposal 2 [For discussion] If solution U5 is agreed as in P1, inform RAN3 of RAN2 conclusion and up to RAN3 on potential spec impact (if any) between source gNB and target gNB.

Proposal 3 [For discussion] If solution U3 is agreed as in P1, FFS whether/how to capture the new Remote UE behaviour due to solution U3 in RAN2 Spec (e.g., with NOTE or normative text in TS 38.323).

Discussion:

vivo indicate that the summary contains a summary of pros and cons, and the main points are implementation difficulty for the UE in U3, and for the network in U5.

InterDigital understand that U5 has the failing that if there is a Uu problem at the source relay, we would lose lossless data delivery. Qualcomm think that in this case the UE should perform re-establishment, and in general we can assume that the relay’s Uu link is good.

Huawei see the concern with U5 as being the dependence on multiple entities: relay UE, source gNB, and target gNB. They are not sure we will be able to ensure that it really is a lossless solution. They see U3 as straightforward and effective.

NEC tend to share Qualcomm’s view; they think U3 may be a bit complex to specify. On InterDigital’s concern, they understand that we can discuss under the assumption that the relay UE’s Uu link is good.

LG support U3 without spec impact; they think it can be applied as best-effort. It depends on UE buffer size, but they think it is clear, while U5 has some ambiguity on when the source gNB can release the relay.

ZTE have the same concern as InterDigital and Huawei; for U5, they think the remote UE may initiate unicast link release and the relay UE cannot continue to deliver uplink data to the source gNB. So they prefer U3 only.

MediaTek have the same view as Qualcomm; on Huawei’s comment about interdependency, they think the relay’s Uu link should be good.

Apple think we agreed to pursue a PDCP SR based solution as a baseline, and U5 is not using a PDCP SR. So they think we should take U3 as a baseline. They are also concerned about the assumption that the Uu link remains good.

Ericsson have the concern for U5 that there could be no Xn between the source and target gNBs; they think U3 is a better solution and could be captured as a NOTE.

InterDigital think we cannot necessarily assume that the Uu link is good, given that the UE is being switched to direct; one possible reason is a failing Uu.

Samsung agree with LG and think we could follow U3.

vivo interpret based on company contributions and this discussion that U3 has one unclear point on whether companies want normative text to have the UE perform retransmission of all the data buffered and not acknowledged by PDCP. They think LG and Samsung are not asking for this kind of UE behaviour, but other proponents of U3 are assuming it. So we may need to clarify what is meant by U3.

vivo indicate that after offline discussion, the U3 proponents agree that it would be mandated that at the path switch, the UE has to perform mandatory retransmission of non-discarded and non-acked (by PDCP SR) PDCP SDUs once the UE receives the PDCP SR.

Huawei think we are talking about buffering a relatively small number of packets. Qualcomm understand that the UE does not know when the path switch will occur and therefore always needs to buffer packets.

Ericsson have some sympathy for the concern about always storing packets. They can be open to accepting U5.

Samsung are concerned about the mandatory UE behaviour, and they do not think it is necessarily a small amount of data.

NEC have the same concern as Ericsson; if there is a mandatory clarification in the PDCP spec, it would limit the UE behaviour all the time.

Apple want to clarify that the PDCP buffering behaviour is legacy behaviour, because the PDCP spec says discarding is based on acknowledgement and the discard timer; the difference is just the retransmission. So they do not see why there is a concern about buffering affecting QoS.

vivo indicate that a majority of companies supporting U3 do not want to change legacy behaviour on the UE buffering.

OPPO think the PDCP retransmission triggered based on the PDCP SR is also different from legacy behaviour; they wonder if there could now be a double-triggered retransmission.

Samsung have a different view from Apple; they see that the legacy operations do not mandate the UE to retransmit acked RLC packets.

Ericsson think the advantage of L2 was not having to change PDCP, and now we consider needing to change it.

LG have the same concern as Samsung and Ericsson and want to further discuss both U3 and U5.

vivo think the situation is clear: If we change the intended behaviour on how to buffer the data, some companies cannot accept it, so we should exclude this part from U3. They think we either take U5 or we take U3 without changing the UE buffering behaviour.

Ericsson think the current spec is not completely clear, because it allows the UE to hold packets after they have been acked by RLC, but never calls for them to be retransmitted. They think if we want to do U3, we have to change the UE behaviour.

Qualcomm think the issues for U5 are not so significant; data forwarding already exists.

InterDigital think companies are trying to indicate that U3 would impose a new buffering requirement; they understand that we can have the retransmission requirement without a new buffering requirement. Nokia have the same understanding, so they see that U3 does not increase the buffering requirement.

Xiaomi understand that in legacy behaviour, the UE can discard the data that are acknowledged by RLC, and this would be changed by U3..

Apple wonder if U5 has any specification impact.

MediaTek think we have discussed at length, and they see critical issues for U3 but not for U5; they think U5 does not have spec impact.

NEC do not see spec impact from U5, and they think we could ask RAN3 to check.

Huawei are concerned that U5 cannot guarantee lossless behaviour.

Qualcomm think we could send an LS to RAN3 on U5 and conclude that U3 is not feasible from RAN2 point of view. Ericsson wonder what RAN3 will do with the LS, since U5 is up to implementation.

Ericsson think we have to go for the lesser problem; they think neither solution can fully guarantee lossless behaviour.

Qualcomm cannot agree to U3 and think we can exclude it from RAN2 point of view. NEC share the same view.

Huawei think RAN3 previously discussed this, and they cannot comment on the air interface part.

Apple interpret the Ericsson comment to mean that the situation is a bit hopeless, and they understand that some companies in RAN2 think U5 will not work. They would be OK to accept having no uplink solution.

InterDigital note that RAN3 already informed us that it was up to RAN2 to resolve.

ZTE think we could support both U3 and U5.

vivo think we have to conclude no consensus and close the discussion.

NEC think we should inform RAN3 if there is no consensus.

Nokia understand that the Rel-17 PDCP-based solution is still there.

Agreement:

RAN2 will not specify any Rel-18 enhancement for lossless behaviour for uplink service continuity in L2 U2N relay.

Proposal 4 [For discussion] For downlink lossless data delivery for path switch, RAN2 to down-select between solution D4 and solution D5, and inform RAN3 of RAN2 decision.

Discussion:

Ericsson are not comfortable with D4.

Qualcomm wonder if RAN2 should really be discussing D4 and D5, which are about data forwarding and more in RAN3 scope. They understand there are related proposals in RAN3.

Xiaomi also think it is RAN3 scope.

NEC wonder if we are reverting a previous agreement if we eliminate D4.

LG think D4 has spec impact in RAN3 and D5 is gNB implementation, and any solution we select would require an LS to RAN3.

NEC think we should send an LS to RAN3.

CMCC think we could discuss D3 here and send D4 and D5 to RAN3 for further discussion. They understand that RAN3 have concluded to leave the issue to RAN3.

ZTE think we have spent a lot of time on this and both D4 and D5 have RAN3 impact, so we can ask RAN3 to select.

Qualcomm think RAN3 are already considering these solutions. Xiaomi agree. Ericsson agree.

NEC think the intention of the LS is to avoid having RAN3 introduce RAN2 spec impact.

vivo agree with Qualcomm and others, and they think we should only send an LS if we have a preference.

Agreement:

RAN2 will not specify any Rel-18 enhancement from UE perspective for lossless behaviour for downlink service continuity in L2 U2N relay.

Proposal 5 [For discussion] RAN2 to discuss whether the uplink & downlink lossless delivery solution(s) to be agreed for inter-gNB path switch cases are applied to intra-gNB i2i path switch (when applicable).

Proposal 7a [For discussion] RAN2 to agree that any operation based on direct comparison between the SD-RSRP and SL-RSRP measured at the Remote UE side is not supported in Rel-18.

Discussion:

Nokia are not sure what the concern on this proposal is, since it aligns with the RAN1/RAN4 LSs. Apple have the same view and think the proposal is agreeable. Qualcomm and LG also agree.

Agreement:

Any operation based on direct comparison between the SD-RSRP and SL-RSRP measured at the Remote UE side is not supported in Rel-18.

[Lower priority]

Proposal 8 [Lower priority] RAN2 to deprioritize discussion on the addressing the following mobility issues to support remote UE’s path switch in Rel-18.

 simultaneous relay UE’s inter-gNB HO and connected remote UE’s path switching

 selection of relay UE in RRC\_IDLE or RRC\_INACTIVE state

 relay UE’s cell reselection or HO during indirect path switching of the remote UE

 prolonged inter-gNB signaling over Xn interface for inter-gNB path switching

 CHO-like path switching solution for remote UE

 DAPS like path switch solution for remote UE

 group handover for relay UE and remote UE(s)

The following tdocs will not be individually treated

[R2-2304681](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304681%20Draft%20LS%20to%20RAN3%20on%20Lossless%20Path%20Switching.docx) DRAFT LS for Draft LS to RAN3 on Lossless Path Switching for Sidelink Relay NEC LS out Rel-18 NR\_SL\_relay\_enh-Core To:RAN3

[R2-2304755](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304755%20-%20Discussion%20on%20lossless%20data%20forwarding%20for%20inter-gNB%20service%20continuity.docx) Discussion on lossless data forwarding for inter-gNB service continuity OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305025](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305025%20Discussion%20on%20lossless%20path%20switching%20for%20Sidelink%20Relay.docx) Discussion on lossless path switching for Sidelink Relay CANON Research Centre France discussion Rel-18

[R2-2305044](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305044%20Further%20discussion%20on%20service%20continuity%20for%20SL%20relay.doc) Further discussion on service continuity for SL relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305063](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305063%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

[R2-2305182](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305182%20(R18%20SL%20Relay%20WI_AI793%20ServiceContinuity).doc) Remaining Issues on Service Continuity InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305209](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305209-SL%20U2N%20relay%20for%20the%20service%20continuity%20enhancement.docx) SL U2N relay for the service continuity enhancement LG Electronics France discussion Rel-18

[R2-2305217](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305217.docx) Discussion on service continuity enhancement Xiaomi discussion

[R2-2305234](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305234_Discussion%20on%20lossless%20delivery%20solution%20for%20inter-gNB%20path%20switching.docx) Discussion on lossless delivery solution for inter-gNB path switching China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305247](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305247_Remaining%20issues%20on%20service%20continuity%20enhancement%20for%20L2%20U2N%20relay.docx) Remaining issues on service continuity enhancement for L2 U2N relay vivo discussion

[R2-2305280](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305280%20Further%20Consideration%20on%20Service%20Continuity%20Enhancements%20for%20L2%20U2N%20Relay.docx) Further Consideration on Service Continuity Enhancements for L2 U2N Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305419](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305419%20DiscusionRSRP-LSs.docx) Discussion on reply LSs on RSRP issues (R1-2304211 / R2-2304617 and R4-2306366 / R2-2304637) Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh

[R2-2305420](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305420%20SL%20Relay%20Service%20Continuity.docx) Discussion on L2 U2N relay service continuity issues for inter-gNB path switch Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh

[R2-2305521](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305521.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2305549](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305549_Discussion_on_Inter_gNB_Service_Continuity.docx) Discussion on Inter-gNB Service Continuity Ericsson España S.A. discussion Rel-18

[R2-2305552](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305552.doc) Service continuity enhancements support for L2 U2N relay Spreadtrum Communications discussion Rel-18

[R2-2305585](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305585_Service%20Continuity%20Enhancements%20and%20Lossless%20Data%20Delivery.docx) Service Continuity Enhancements and Lossless Data Delivery NEC Corporation discussion NR\_SL\_relay\_enh-Core

[R2-2305619](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305619%20Discussion%20on%20service%20continuity.docx) Discussion on service continuity CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305761](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305761%20Lossless%20Inter-gNB%20path%20switching%20v1.0.docx) Lossless Inter-gNB path switching Lenovo discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305764](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305764%20Evaluation%20and%20proposals%20on%20U3%20and%20U5%20_r2.docx) Evaluation and proposals on U3 and U5 Qualcomm Incorporated, OPPO, Xiaomi discussion NR\_SL\_relay\_enh-Core

[R2-2305979](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305979%20Discussion%20on%20service%20continuity.docx) Discussion on Service Continuity Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306260](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306260%20Remaining%20issues%20for%20service%20continuity.docx) Remaining issues for service continuity MediaTek Inc. discussion Rel-18

[R2-2306374](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306374%20Discussion%20on%20Event%20Z2.doc) Discussion on Event Z2 Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306381](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306381-U2N-lossless.doc) remaining issues for i2x path switching with lossless delivery Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306383](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306383-U2N_Discussion%20on%20remaining%20issues%20for%20path%20switching.doc) Discussion on remaining issues for path switching Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.4 Multi-path relaying

Mechanisms to support multi-path scenarios 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). This agenda item will include a rapporteur contribution summarising open issues from RAN2#121 (invited contribution not counted against the tdoc limit).

Agenda item summary and report of [AT122][402]

[R2-2306556](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306556%20-%20Summary%20of%20%5bPre122%5d%5b403%5d%5bRelay%5d%20Summary%20of%20AI%207.9.4%20on%20multi-path%20relay%20(OPPO).docx) [Pre122][403][Relay] Summary of AI 7.9.4 on multi-path relay (OPPO) OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

* [AT122][402][Relay] Multi-path relay summary proposals (OPPO)

Scope: Discuss and gauge support on the proposals in R2-2306556, converge on easily agreeable parts, and identify discussion points for the online session on Tuesday 2023-05-23.

Intended outcome: Summary to online session in R2-2306672

Deadline: Tuesday 2023-05-23 1100 KST

[R2-2306672](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306672%20-%20Summary%20of%20%5bAT122%5d%5b402%5d_V15_Rapp.docx) [AT122][402][Relay] Multi-path relay summary proposals (OPPO) OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[Unanimous]

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

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

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

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

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

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

Agreements:

For Scenario-1/2, PDCP duplication of DRB is controlled by legacy Duplication Activation/Deactivation MAC CE and Duplication RLC Activation/Deactivation MAC CE delivered via direct path.

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

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

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

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

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

[Majority Support]

[Majority Support] Proposal 3 For Scenario-1/2, optionally configure UL data split threshold for split DRB. FFS the usage of the threshold follows legacy behavior or not. FFS whether default value infinity is supported

Discussion:

OPPO indicate that the FFS on infinity was not really discussed and might be removable.

Agreement:

For Scenario-1/2, optionally configure UL data split threshold for split DRB. Usage of the threshold follows legacy behavior.

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

Agreement:

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

[Majority Support] Proposal 12a For Scenario-1, R2 confirm support of non-split SRB2 on indirect path.

Discussion:

Ericsson are not sure why we differentiate between SRB1 and SRB2, and they think this will bring back the previous discussion. They think all SRBs should have the same treatment.

Qualcomm think this should be the baseline, because currently SRB1 and SRB2 are coupled, and they see no motivation to decouple them.

OPPO indicate that there was controversy about SRB1 but less about SRB2, but they see the concern for separate handling.

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

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

Discussion:

Xiaomi wonder if these agreements imply that we would use the same IEs as legacy to trigger the path addition/change. OPPO think we should go step by step on the agreements and think about the other aspects later; Apple agree with OPPO and think the reuse of reconfigurationWithSync is more a stage 3 issue.

Xiaomi think if it might be a new IE, we should talk about “T304-like” and “T420-like” timers.

Nokia have some sympathy for Xiaomi’s point and think it would be safer to say “-like”.

OPPO understand that most companies wanted to reuse the existing timers, but they could accept the “-like” wording.

Agreements:

For Scenario-1, use T304-like timer for direct path addition and change. FFS on expiry behavior.

For Scenario-1, use T420-like timer for indirect path addition and change. FFS on stop condition and expiry behavior.

FFS if these two timers are new or reuse the existing timers.

[Majority Support] Proposal 17 For Scenario-2, R2 assume remote-UE reports the RRC\_CONNECTED relay-UE C-RNTI and cell-ID for indirect path addition.

[Majority Support] Proposal 19 For Scenario-2, R2 sends LS to S3 about the R2 assumption to check if any security concern for relay-UE sharing the ID towards remote-UE.

Discussion:

Ericsson think the LS to SA3 should include P17.

Lenovo are OK with the proposal but wonder about the cell ID: is it NCGI? They understand it could be, given current discovery signalling.

Xiaomi think we need some further discussion about which cell ID, because it relates to how the relay UE shares its cell ID. They think we could ask SA3 about this aspect.

Qualcomm think if we are going to ask SA3, we should take a working assumption rather than an agreement.

vivo are concerned about the overhead of NCGI. ZTE think PCI collision is a concern, and they think since this is RRC signalling, the overhead is not a big deal.

LG have some sympathy for vivo’s view. They think scenario 2 is less likely to have a collision problem.

WA: For scenario 2, remote-UE reports the RRC\_CONNECTED relay-UE C-RNTI and serving cell ID (e.g., NCGI) for indirect path addition.

LS to SA3 to check if there is any security concern with the WA.

* [AT122][420][Relay] LS to SA3 on reporting of relay UE C-RNTI and NCGI (OPPO)

Scope: Draft an LS to SA3 informing them of our WA on remote UE reporting the C-RNTI and serving cell ID of RRC\_CONNECTED relay UE in scenario 2, and asking if there is any security concern.

Intended outcome: Approvable LS in R2-2306693

Deadline: Thursday 2023-05-25 2000 KST

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

Discussion:

CMCC understand we have agreed that the UE-to-UE link failure can be reported to the network, and it is not clear what the gNB would do if not an indirect-to-indirect path change. They understand that if the remote UE can report more than one relay UE to the network, the network could fall back to a different relay UE in case of failure.

Qualcomm agree with CMCC and think we do not need any specific effort to do it compared to scenario 1.

Apple support P20, because the link is supposed to be ideal, i.e., failures should not happen. LG have a similar understanding and think that if a failure happens, the remote UE can report a new relay UE if needed.

Nokia agree with Apple and LG and think the gNB could just not transmit in DL on the indirect path.

Xiaomi understand the relationship between remote and relay UE in scenario 2 is not supposed to change dynamically, so they think this case should not be prioritised.

Qualcomm think the link could be BT or WiFi and subject to failure; they think we do not need to exclude this scenario now.

Huawei agree with CMCC and Qualcomm and think it was already agreed that the connection failure can be reported to the network. For the multiple relay UE reporting, they understand that scenario 1 provides a framework that we can reuse, and it would actually be more work to exclude it.

LG point out that we should consider the ideal case. They think the failure reporting will normally happen only when the link is switched off intentionally, and there is no way to report on the indirect path, so it is useful for the gNB to be able to release it; but they think this should not be a frequent case.

OPPO think there is no clear majority and we could skip the proposal. MediaTek agree.

[R2 discuss]

[R2 discuss] Proposal 1 For Scenario-1/2, MP remote UE is configured with a single cell group, i.e., MCG, for the direct path, and SL configuration, for the indirect path.

Discussion:

Nokia think this obliges us to discuss the duplication activation MAC CE, because both bearers now belong to the same cell group, so the RLC entities may not be unique.

OPPO think this issue is independent of the proposal, and we are trying to stay close to the Rel-17 ASN.1 design. They think the point may be valid but we can further consider how to solve it. They also think we need to decide whether to reuse the legacy duplication control MAC CE.

Ericsson wonder if there is any need to take the agreement now, since it seems more stage 3.

Nokia do not intend to challenge the agreement but think we need to look at the MAC CE; they think it needs to be decided now since the modelling may affect the signalling.

NEC think this proposal is more of a clarification than a stage 3 issue.

LG think the proposal is necessary and related to the inter-DU scenario, since it could cause having only the MCG for both DUs.

Ericsson would like some clarification on what “MCG” means in this context. Normally it means we have a PDCP entity and lower layers associated, and here it seems to mean we have a PDCP entity and two sets of lower layers.

OPPO intend to refer to the legacy field where the configuration is generated by the DU; the intention is to keep the framework the same as in Rel-17.

LG think with this agreement, the inter-DU case will result in separate MAC entities for a single cell group. They think it would be more impact to have a second cell group.

OPPO think we are talking about one path via Uu MAC and the other via PC5, so we can think about modelling issues. They note that there is a separate proposal for the related mode 1 issue.

Ericsson think this does not solve the inter-DU case, where we would have a PDCP entity and two sets of lower layers. Their concern is that we would get into careless use of the term MCG and have it mean different things in different places.

ZTE think we have only one PDCP entity, but for the lower layer configurations, only the DU of the direct path is responsible for them; the other DU only has to configure the sidelink. They also note that this aligns with the previous decision that the sidelink UE does not support DC.

LG think considering the Ericsson comment, the easy solution would be not to support mode 1 for the inter-DU case, or perhaps not to support the inter-DU case for multi-path at all.

Ericsson think we should just call it a PCell and have the PCell also configure the sidelink; whether it is captured in the MCG’s configuration is stage 3.

OPPO understand that no one wants two cell groups, there are just concerns on the implications of this agreement. They do not see that the agreement can be reworded to use PCell.

WA: For Scenario-1/2, MP remote UE is configured with a single cell group, i.e., MCG, for the direct path, and SL configuration, for the indirect path.

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

Discussion:

LG are OK with the proposal, and think we should agree as early as possible, to allow for analysis of whether new IEs are needed in the message.

InterDigital think this is a stage 3 issue and the main thing is what information is needed.

Qualcomm are not sure the SIdelinkUEInformationNR makes sense for scenario 2. They think MeasurementReport might be a candidate for scenario 2.

OPPO think if it is a matter of taste, we could skip for now.

vivo would prefer to use the same procedure for both scenarios, and in light of the previous WA, they think we could go with MCGFailureInformation. Xiaomi agree.

Qualcomm think the gNB might not be able to distinguish from an MCGFailureInformation which path failed. They foresee different UE behaviour for the two cases.

OPPO indicate that in the email discussion, more companies preferred SidelinkUEInformationNR, but this may have been more for scenario 1. They think MCGFailureInformation is more oriented to the Uu link and SidelinkUEInformationNR to the indirect path.

Huawei think SidelinkUEInformationNR is more suitable at least for scenario 1.

Apple agree with Huawei, and they think we will need a new message for scenario 2.

Ericsson see this as a stage 3 detail.

Nokia would prefer to keep the proposal even though it looks a bit stage 3.

LG tend to think a new message may make sense for both scenarios.

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

Discussion:

Xiaomi think companies want to align with the legacy design, where the primary path is always on the MCG; under our previous WA, that would mean both paths, so they see no reason to limit. InterDigital agree, and they also think the network can configure as it wants to. ZTE also agree and think the indirect path may be of better quality. Nokia agree.

Ericsson disagree because they understand that the direct path will always be better quality. Nokia are not sure this is right, and if we limit the primary to direct, then the only way to use the indirect path for SRB transmission is to split and duplicate, which costs more resources.

Samsung have a similar understanding to Nokia; they think we could separate SRB1 and SRB2.

Qualcomm think there is no motivation to decouple SRB1 and SRB2, and they think the direct path will always be more reliable, because failures on the two hops of the indirect path accumulate.

Xiaomi understand that the relay intention was to provide coverage extension, including to UEs OOC, so clearly there are some cases where the indirect path is more reliable. Apple note that these arguments are speculative in the absence of deployments, and from a signalling design perspective we should allow both.

vivo think there is no benefit from decoupling SRB1 and SRB2, and we should keep the design simple and limit to the direct path.

OPPO think opinions have not moved and there is a slight majority for enabling the network flexibility.

Huawei think the discussion is repeated and there needs to be a justification or use case.

Qualcomm think the flexibility would increase UE implementation complexity, test cases, etc.

Ericsson agree that there has been no deployment, but the Uu link has been optimised for supporting uplink transmissions with tools like link adaptation, and we are not sure what we will see from the sidelink.

Xiaomi think there are cases where the indirect path is more reliable, and this proposal may not be a simplification of the spec in practice.

LG understand we agreed that MCGFailureInformation can be sent on the indirect path, so if we follow legacy operations, the primary path is set to the SCG.

Qualcomm understand that we do not change the primary path to an SCG bearer in this case.

Ericsson also wonder what happens if the direct path fails; does the UE become similar to a Rel-17 UE with the control plane on the indirect path.

Nokia understand if the MCG fails, the UE changes the SCG role and sends the failure notification. So they think we would have an exception in the spec for this case. OPPO have a similar view. Huawei also have the same understanding: In the existing DC framework, the primary path is always on MCG, and if the MCG fails, the UE switches the primary path to SCG.

vivo agree with Huawei.

WA: For scenario 1, primary path of the split SRB1 and SRB2 is always configured on direct path. This does not preclude having the case where the UE switches the primary path to the indirect path for reporting after direct path failure.

[R2 discuss] Proposal 12b For Scenario-1, R2 further discuss whether non-split SRB1 on indirect path is supported.

Discussion:

InterDigital think that the UE may not support split SRB, so we may be dependent on having the flexibility in this case.

OPPO think we can adopt the simpler route as with the previous proposal. They think if we allow the non-split SRB1 on indirect path, the UE may experience unnecessary service interruption, because the direct path might work well while the indirect path experiences a failure.

Nokia have sympathy for some commonality with the previous decision, but they do not think the scenario mentioned by OPPO is a frequent problem. They also think this restriction would mean the only way to use the indirect path would be a split bearer with duplication, which would be a problem if the direct path is worse. So they would like more time to think about this issue.

Xiaomi have a similar view to Nokia.

vivo understand that supporting this would force a re-establishment when the indirect path fails.

InterDigital point out we have an existing agreement about the non-split SRB. Qualcomm understand that this was based on the condition that the PCell is always on the direct path.

Apple have a similar view to InterDigital; the UE may not support split SRB, and for non-split SRB, we would then have some scenarios that would not be well covered. They see more impact if we do not support the non-split SRB on indirect path than if we do.

Samsung understand the intention of the proposed agreement is whether we decouple SRB1 and SRB2; in their view they can be decoupled because they have different priority.

OPPO think this may be as far as we can go for now.

Agreements:

For scenario 1, SRB1 and SRB2 are not decoupled in terms of support of non-split SRB on indirect path; i.e., if SRB1 can be supported on indirect path, so can SRB2.

[R2 discuss] Proposal 13 For Scneario-1, support mode-1 of remote UE by reporting SR/BSR and receiving SL DG via direct-path. And mode-1 is supported at least for intra-DU case, whether it is supported for inter-DU case is up to R3 but R2 does not expect R2 impact. LS to R3 to notify this conclusion.

Discussion:

NEC think RAN3 have already received proposals for the inter-DU case, and they think the discussion can be left to RAN3, but we need to ensure that RAN2 spec impact is avoided.

LG think if mode 1 is supported for inter-DU, RAN3 need to discuss it, and from RAN2 perspective they think it would simplify things if we do not support it. They think there would be RAN2 impact and we cannot leave it fully to RAN3.

InterDigital do not see an issue for the inter-DU case and think there should be no RAN2 impact.

Samsung understand that for the inter-DU case, the air interface is dynamic enough that scheduling may be infeasible. They wonder how RAN3 will know if their solution has RAN2 impact or not.

Ericsson think it is not about passing information through F1, and RAN3 can handle the situation without impact to us.

ZTE indicate that RAN3 previously discussed this case and could not reach a conclusion; they thought it was better to be discussed by RAN2. Since there is no DU-DU interface, they understand that we would be asking for a new interface just for delivering sidelink grants.

Apple think the remote UE’s mode 1 scheduling should only be done by the DU serving the remote UE, and the relay UE’s DU does not need to be involved.

NEC think the question is which DU will take the responsibility for scheduling the remote UE, and this needs to be answered by RAN3.

Huawei understand that we are discussing CU-DU solutions based on the assumption that there are two DUs, one responsible for the remote UE’s direct link and the other responsible for the relay UE’s Uu. They think it is not clear that RAN3 will go with this assumption, and we can just inform RAN3 how the scheduling works from air interface perspective and they can decide.

LG wonder why we indicate no RAN2 impact. OPPO think it is important to indicate.

LG think there will be some RAN2 impact. Samsung agree and think we do not need to indicate this; we can just give them the responsibility to take the decision.

NEC think it is important to indicate that we do not want to accept RAN2 impact; if there is some after all, we should be able to decide if that means we avoid supporting the inter-DU case.

Agreement:

For Scenario-1, mode-1 scheduling for remote UE is supported at least for intra-DU case, with the SR/BSR and grant sent on the direct path; whether it is supported for inter-DU case is up to R3, but R2 do not intend to make specification changes to support this case, and for specification purposes RAN2 intend to model it as a single MAC entity at the UE. LS to R3 to notify this conclusion, with “take into account” action.

* [AT122][421][Relay] LS to RAN3 on mode 1 scheduling in inter-DU multi-path case (NEC)

Scope: Draft an LS to RAN3 (with “take into account” action) informing them of our agreement on mode 1 scheduling for the remote UE in scenario 1.

Intended outcome: Approvable LS in R2-2306781

Deadline: Thursday 2023-05-25 2000 KST

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

[Postpone]

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

R2-2306693 (LS from [420]) OPPO LS out Rel-18 To:SA3

R2-2306781 (LS from [421]) NEC LS out Rel-18 To:RAN3

The following tdocs will not be individually treated

[R2-2304664](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304664%20-%20Discussion%20on%20multi-path%20Relay_V01.docx) Discussion on multi-path SL relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304958](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304958%20Discussions%20on%20Multi-path_v2.docx) Discussions on multi-path Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305008](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305008_SLRelay_S1&2_v2.doc) Discussion sidelink relay enhancement for scenario 1&2 Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305045](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305045%20Discussion%20on%20the%20RAN2%20impacts%20of%20multi-path%20relaying%20with%20CUDU%20split%20architecture.docx) Discussion on the RAN2 impacts of multi-path relaying with CU/DU split architecture ZTE, OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305046](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305046%20Further%20discussion%20on%20the%20support%20of%20multi-path%20relaying.docx) Further discussion on the support of multi-path relaying ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305064](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305064%20Discussion%20on%20control%20plan%20design%20for%20Multi-path.doc) Discussion on Multi-path Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305183](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305183%20(R18%20SL%20Relay%20WI_AI794%20MultipathAspects).doc) Design Aspects for Multi-path InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305218](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305218.docx) Discussion on multi-path Xiaomi discussion

[R2-2305232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305232%20Discussion%20on%20the%20mode%201%20RA%20issue%20under%20multi-path%20scenario.docx) Discussion on the mode 1 RA issue under multi-path scenario NEC, Nokia,OPPO,ZTE,Huawei, HiSilicon, Sharp, Samsung, Philips, MediaTek discussion NR\_SL\_relay\_enh-Core

[R2-2305235](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305235%20Discussion%20on%20remaining%20issues%20of%20multi-path%20relaying.docx) Discussion on remaining issues of multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305248](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305248_Remaining%20Issues%20for%20Multi-path%20Scenario%201%202.docx) Remaining Issues for Multi-path Scenario-1 and Scenario-2 vivo discussion

[R2-2305281](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305281_Discussion%20on%20Multi-path%20Scenario1.docx) Discussion on Multi-path Scenario 1 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305282](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305282_Leftover%20issues%20on%20Multi-path%20scenario2.docx) Leftover issues on Multi-path scenario2 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305522](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305522.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2305550](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305550_Discussion_on_multipath%20relays.docx) Discussion on Multipath Relays Ericsson España S.A. discussion Rel-18

[R2-2305553](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305553.doc) Discussion on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2305586](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305586_Discussion%20on%20Multi-path%20Relaying.docx) Discussion on Multi-path Relaying NEC Corporation discussion NR\_SL\_relay\_enh-Core

[R2-2305620](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305620%20Discussion%20on%20multi-path%20scenario%201.docx) Discussion on multi-path scenario 1 CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305621](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305621%20Considerations%20on%20multi-path%20scenario%202.docx) Considerations on multi-path scenario 2 CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305698](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305698%20Procedure%20for%20second%20path%20addition%20v1.0.docx) Procedure for second path addition Lenovo discussion Rel-18

[R2-2305765](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305765-Address%20contravercial%20issues%20for%20MP%20relay.docx) Address controversial issues on multi-path relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2305873](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305873_multipath_relay.docx) Considerations for multipath relay operations for Scenario 1 Kyocera discussion

[R2-2305945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305945%20Discussion%20on%20Multi-path%20relaying.docx) Discussion on Multi-path relaying Lenovo discussion NR\_SL\_relay\_enh-Core

[R2-2306127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306127%20Resource%20allocation%20and%20BSR%20reporting%20for%20multi-path.docx) Resource allocation and BSR reporting for multi-path ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306192](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306192%20Remaining%20issues%20on%20multi-path%20operation.docx) Remaining issues on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306310](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306310_Discussion%20on%20multi-path%20scenario%201_III.docx) Discussion on multi-path scenario 1 III discussion NR\_SL\_relay\_enh-Core

[R2-2306313](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306313%20Multipath%20SL%20relay.docx) Multipath SL relay Nokia, Nokia Shanghai Bell discussion

[R2-2306355](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306355%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

[R2-2306382](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306382-MP.doc) Remaining issues for multi-path relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2306445](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306445%20Discussion%20on%20Multipath%20v01.docx) Discussion on Multipath MediaTek Inc. discussion Rel-18

[R2-2306497](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306497_SL-MP-Relaying_ThroughputEnhancements.docx) About Throughput Enhancements in Sidelink Multi-Path Relaying Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

### 7.9.5 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.

[R2-2304756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304756%20-%20Discussion%20on%20DRX%20for%20L2%20U2N%20relay.docx) Discussion on DRX for L2 U2N relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305065](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305065%20Discussion%20on%20SL-DRX.doc) Discussion on SL DRX for L2 UE-to-NW relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2305219](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305219.docx) Discussion on SL DRX in U2N relay Xiaomi discussion

[R2-2305592](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305592%20Considerations%20on%20paging%20for%20sidelink%20relay.docx) Considerations on paging for sidelink relay Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core

[R2-2306193](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306193%20Left%20issues%20on%20sidelink%20DRX%20for%20L2%20U2N%20relay.doc) Left issues on sidelink DRX for L2 U2N relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

## 7.24 NR TEI18

Specific items may be allocated to a breakout session for treatment.

Time budget: 1 TU

### 7.24.1 TEI proposals by Other Groups

Items initiated by other groups that is/has been communicated by LS, where the other group indicate this is TEI18. (Specific other-group-WIs should use the R18 Other Agenda Item below).

Incoming LSs (note: R2-2304609 was intended to be noted at RAN2#121bis-e)

[R2-2304609](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304609_R1-2302201.docx) LS on 1-symbol PRS (R1-2302201; contact: ZTE) RAN1 LS in Rel-18 TEI18 To:RAN2, RAN3 Cc:RAN4

* Noted

[R2-2304623](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304623_R3-231935.doc) Reply LS on 1-symbol PRS (R3-231935; contact: ZTE) RAN3 LS in Rel-18 TEI18 To:RAN1 Cc:RAN2

* Noted

1-symbol PRS

[R2-2306079](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306079%20Introduction%20of%201-symbol%20PRS%20in%2038.331%5b1symbol_PRS%5d.docx) Introduction of 1-symbol PRS in 38.331[1symbol\_PRS] ZTE Corporation CR Rel-18 38.331 17.4.0 4014 1 B TEI18 R2-2303498

* Revised in R2-2306793

[R2-2306793](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306793%20Introduction%20of%201-symbol%20PRS%20in%2038.331%5b1symbol_PRS%5d.docx) Introduction of 1-symbol PRS in 38.331[1symbol\_PRS] ZTE Corporation CR Rel-18 38.331 17.4.0 4014 2 B TEI18 R2-2303498

Discussion:

Samsung think there is no gain in having the range 13 instead of 0..13. Intel want to clarify that if the network does not provide the value, the only possibility is no offset. They think if the new field is absent, the UE should refer to the original field.

Qualcomm think there will be a problem in LPP, because an old UE may not understand the extension and will assume a wrong value for the extension. ZTE indicate it is a Rel-18 feature with a capability, so this should not be a problem.

Intel wonder if we should use an enumeration; they think an integer will occupy space even with a single value.

Intel point out that changes on changes need to be removed

* Postponed

[R2-2306080](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306080%20Introduction%20of%201-symbol%20PRS%20in%2037.355%5b1symbol_PRS%5d.docx) Introduction of 1-symbol PRS in 37.355[1symbol\_PRS] ZTE Corporation CR Rel-18 37.355 17.4.0 0437 1 B TEI18 R2-2303499

* Revised in R2-2306794

[R2-2306794](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306794%20Introduction%20of%201-symbol%20PRS%20in%2037.355%5b1symbol_PRS%5d.docx) Introduction of 1-symbol PRS in 37.355[1symbol\_PRS] ZTE Corporation CR Rel-18 37.355 17.4.0 0437 2 B TEI18 R2-2303499

* Postponed

[R2-2306081](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306081%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2037.355%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 37.355[1symbol\_PRS] ZTE Corporation CR Rel-18 37.355 17.4.0 0453 - B TEI18

* Revised in R2-2306795

[R2-2306795](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306795%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2037.355%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 37.355[1symbol\_PRS] ZTE Corporation CR Rel-18 37.355 17.4.0 0453 1 B TEI18

* Postponed

[R2-2306082](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306082%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2038.331%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 38.331[1symbol\_PRS] ZTE Corporation CR Rel-18 38.331 17.4.0 4128 - B TEI18

* Revised in R2-2306796

[R2-2306796](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306796%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2038.331%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 38.331[1symbol\_PRS] ZTE Corporation CR Rel-18 38.331 17.4.0 4128 1 B TEI18

* Postponed

[R2-2306083](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306083%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2038.306%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 38.306[1symbol\_PRS] ZTE Corporation CR Rel-18 38.306 17.4.0 0923 - B TEI18

* Revised in R2-2306797

[R2-2306797](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306797%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2038.306%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 38.306[1symbol\_PRS] ZTE Corporation CR Rel-18 38.306 17.4.0 0923 1 B TEI18

* Postponed
* [AT122][403][POS] 1-symbol PRS CR check (ZTE)

Scope: Check the CRs in R2-2306079 / R2-2306080 / R2-2306081 / R2-2306082 / R2-2306083

Intended outcome: CRs agreeable in principle

Deadline: Wednesday 2023-05-24 2000 KST

### 7.24.2 TEI proposals by RAN2

Items initiated in RAN2.

Tdoc limitation: 1 tdoc, limitation only applicable for non-previously-agreed-to-be-considered TEI proposals.

Emergency cause value for relay

[R2-2304759](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304759%20-%20Discussion%20on%20emergency%20cause%20value%20for%20SL%20Relay.docx) Discussion on emergency cause value for SL Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core, TEI18

GNSS LOS/NLOS

[R2-2304838](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304838.docx) GNSS LOS/NLOS assistance information, stage 3 details and corrections Vodafone, Spirent, Ericsson, Telecom Italia discussion Rel-18

* Revised in R2-2306534

[R2-2306534](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306534.docx) GNSS LOS/NLOS assistance information, stage 3 details and corrections Vodafone, Spirent, Ericsson, Telecom Italia discussion Rel-18

* Noted

[R2-2305474](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305474.docx) GNSS LOS/NLOS assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 37.355 17.4.0 0446 - B TEI18

* Revised in R2-2306537

[R2-2306537](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306537.docx) GNSS LOS/NLOS assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 37.355 17.4.0 0446 1 B TEI18

* Revised in R2-2306788

[R2-2306788](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306788.docx) GNSS LOS/NLOS assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 37.355 17.4.0 0446 1 B TEI18

* Agreed in principle

[R2-2305481](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305481.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 38.331 17.4.0 4109 - B TEI18

* Revised in R2-2306536

[R2-2306536](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306536.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 38.331 17.4.0 4109 1 B TEI18

* Revised in R2-2306787

[R2-2306787](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306787.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 38.331 17.4.0 4109 1 B TEI18

* Agreed in principle

[R2-2305490](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305490.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 36.331 17.4.0 4931 - B TEI18

* Revised in R2-2306535

[R2-2306535](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306535.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 36.331 17.4.0 4931 1 B TEI18

* Revised in R2-2306786

[R2-2306786](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306786.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 36.331 17.4.0 4931 1 B TEI18

* Agreed in principle
* [AT122][404][POS] GNSS LOS/NLOS CR check (Vodafone)

Scope: Check the CRs in R2-2306535 / R2-2306536 / R2-2306537, taking into account the exposition in R2-2306534.

Intended outcome: CRs agreeable in principle

Deadline: Wednesday 2023-05-24 2000 KST

MUSIM cause value for relay

[R2-2304974](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2304974_Discussion%20on%20MUSIM%20paging%20cause%20forwarding.docx) Discussion on MUSIM paging cause forwarding vivo discussion

[R2-2305014](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305014_Paging%20Cause%20forwarding.doc) Paging Cause forwarding Samsung Electronics Co., Ltd discussion Rel-18 TEI18

posSIB reception time

[R2-2305216](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305216.doc) Discussion on how to support posSIB(s) forwarding Xiaomi discussion

* Noted

Proposal 1: Relay UE shall provide the reception time info of the posSIB(s)/SIB9 to remote UE.

Proposal 2: The reception time of the posSIB(s)/SIB9 is referenced by SFN and slots.

Proposal 3: Multiple reference time can be indicated associated with different posSIBs.

Proposal 4: Agree the TP in section 5.

Discussion:

Samsung would like to clarify a point on the GNSS reference time: The IE can include network time and also GNSS time, and if the network time is present it can be used as a reference time. So they think there may be no need for the relay UE to provide the SIB reception time.

ZTE think 37.355 clearly says the location server should ensure the 3-second accuracy for delivery to the target device, and the LMF can know that it faces a remote UE. So they think this can be handled by LMF implementation.

Xiaomi indicate that when the posSIB is requested, it may come from both in-coverage and remote UE, and the LMF and gNB do not know if it originates from a remote UE in the idle/inactive case.

Nokia understood the proposal as giving a timestamp to the posSIBs, but they fail to see how this ensures that the posSIB is not stale. They see that the information in the posSIB needs to be up to date. Xiaomi indicate that the problem is not the delay per se, but that the remote UE cannot derive the correct system time.

Ericsson wonder if this problem may also arise with sidelink positioning when a remote UE is involved.

Qualcomm have a similar view to Samsung: If the network time is included, the problem seems not to exist, and the UE knows that it is remote, so it should be able to take the delivery time into account. They also see that the proposal is general to posSIBs, not just the reference time and SIB9.

Xiaomi understand that the remote UE cannot know how long the delay is for the relay UE to forward, because the delay is introduced at the relay.

Huawei think from LPP perspective, we already have the expiration time, and they wonder if there is still a problem. Also the UE can check the value tag.

Xiaomi understand the validity time is relatively long, but the delay may be within the expiry time yet cause the remote UE to derive incorrect information.

Yaw and APC

[R2-2305265](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305265%20-%20Yaw%20and%20APC%20enhancements.docx) Discussion on Yaw and APC enhancements Swift Navigation discussion

* [AT122][405][POS] Yaw and APC in Rel-18 (Swift)

Scope: Check the proposals in R2-2305265 and adapt the TPs into CRs if agreeable.

Intended outcome: Report to CB session in R2-2306673 and potentially CRs agreeable in principle

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[R2-2306673](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306673%20-%20%5bAT122%5d%5b405%5d%5bPOS%5d%20Yaw%20and%20APC%20in%20Rel-18%20(Swift)_SUMMARY.docx) [AT122][405][POS] Yaw and APC in Rel-18 (Swift) Swift Navigation discussion

Proposal 1: Agree to support the SSR Satellite PCV Residuals in LPP. Updated CRs to be submitted next meeting.

Proposal 2: No agreement on the addition of Yaw. May be considered in future.

Agreement:

RAN2 intend to support the SSR Satellite PCV Residuals in LPP. Updated CRs to be submitted next meeting.

Positioning for remote UEs

[R2-2305850](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305850.docx) Positioning and posSIB forwarding for remote UEs MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo discussion Rel-18 TEI18

* Noted

[R2-2305852](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305852.DOCX) Positioning restrictions for UE-to-network remote UEs [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.305 17.4.0 0134 1 C TEI18 R2-2304318

* Agreed in principle

[R2-2305854](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305854.DOCX) Support positioning of L2 UE-to-network remote UEs [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 37.355 17.4.0 0444 1 C TEI18 R2-2304319

* Agreed in principle

[R2-2305857](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305857.DOCX) Downlink positioning support and posSIB request for L2 UE-to-network remote UE [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.331 17.4.0 4066 1 C TEI18 R2-2304320

* Revised in R2-2306827

[R2-2306827](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306827.docx) Downlink positioning support and posSIB request for L2 UE-to-network remote UE [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.331 17.4.0 4066 2 C TEI18 R2-2304320

Discussion:

CATT clarify that a comment was received about the request from a connected remote UE.

Chair thinks connected mode would be a separate procedure. Xiaomi think the connected mode procedure already works.

Apple also understand that the DedicatedSIBRequest does not need a change, but they have a question about section 5.8.9.9.2; clarification of the wording, and “which has been requested” should be “which have been requested”.

Ericsson see the need for network control on which posSIBs can be forwarded. In connected mode the LMF determines which AD are applicable for the UE; they do not see why it would be different for broadcast. They think the deciphering key for the posSIBs is not necessarily UE-specific. Qualcomm understand that the key is common and distributed only to the UEs that are allowed to receive the posSIB.

Huawei note that encryption is also optional for posSIBs, and they wonder what the consequence would be if we do not introduce a capability for the Rel-18 relay UE.

Ericsson note that the AMF does not know if the UE is remote, and it may continue using the key.

Intel understand that the key comes from upper layers, and the UE gets its key based on NAS registration procedure, which also works for remote UEs. They do not see anything to be changed for the remote UE. CATT share the same understanding; if the remote UE can get the key from the CN, whether it is served by the relay UE or the network, the key still works.

Intel think the relay UE will not share keys in violation of security requirements.

* “which has been requested” to be changed to “which have been requested” in section 5.8.9.9.2
* Agreed in principle with this change, as R2-2306838

Agreement:

RAN2 confirm that the posSIB is forwarded transparently by the relay UE.

[R2-2305859](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305859.DOCX) Capabilities of L2 UE-to-network relay UEs for positioning [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.306 17.4.0 0907 1 C TEI18 R2-2304454

* Revised in R2-2306828

[R2-2306828](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306828.docx) Capabilities of L2 UE-to-network relay UEs for positioning [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.306 17.4.0 0907 2 C TEI18 R2-2304454

* Agreed in principle

[R2-2305865](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305865.docx) Downlink positioning performance results for remote UEs out of coverage MediaTek Inc. discussion Rel-18 TEI18

* Noted

[R2-2306019](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306019%20Relay.docx) Relay based Positioning posSIB forwarding Ericsson discussion Rel-18

* Noted
* [AT122][406][POS] Positioning for remote UEs CR check (CATT)

Scope: Check the CRs in R2-2305852 / R2-2305854 / R2-2305857 / R2-2305859 in light of the exposition in R2-2305850 / R2-2305865, and evaluate the proposals in R2-2306019.

Intended outcome: Report to CB session in R2-2306674 and CRs agreeable in principle

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[R2-2306674](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306674%20Summary%20of%20%5bAT122%5d%5b406%5d%5bPOS%5d%20Positioning%20for%20remote%20UEs%20CR%20check%20(CATT).docx) [AT122][406][POS] Positioning for remote UEs CR check (CATT) CATT discussion Rel-18 TEI18

* Noted

Proposal 1: Endorse the AIP CR on TS 38.305 in R2-2305852.

Proposal 2: Endorse the CR on LPP in R2-2305854.

Proposal 3: Endorse the revised CR on TS 38.331 as a baseline in R2-2306827.

Proposal 4: Endorse the CR on TS 38.306 in R2-2306828 on the revision of posSIB-ForwardingSupported-r18 as CY.

Local cartesian coordinates

[R2-2305889](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305889_(local%20coordinates).docx) Support of Local Cartesian Coordinates in LPP Qualcomm Incorporated discussion

Proposal 1: Confirm the 'Working Assumption' from RAN2#121bis-e:

Support for local Cartesian coordinates for DL-TDOA and DL-AoD positioning is added to LPP.

Proposal 2: Agree the CR in R2-2305891 for "Support of Local Cartesian Coordinates in LPP".

Discussion:

Huawei think this should be considered in future discussions for other scenarios like sidelink positioning.

Ericsson think we will have to discuss that separately in sidelink positioning.

Agreement:

Confirm the 'Working Assumption' from RAN2#121bis-e:

Support for local Cartesian coordinates for DL-TDOA and DL-AoD positioning is added to LPP.

[R2-2305891](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2305891_(LPP%20CR%20on%20local%20coordinates)_v01.docx) Support of Local Cartesian Coordinates in LPP [PosLocalCoords] Qualcomm Incorporated CR Rel-18 37.355 17.4.0 0447 - C TEI18

* Agreed in principle

Multiple QoS for positioning

[R2-2306221](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306221%20(7.24.2)%20multiple%20QoS%20handling%20in%20POS.docx) Introduction of ‘multiple QoS’ class in positioning Samsung R&D Institute UK, Ericsson, Huawei, HiSilicon discussion

Proposal 1. When LMF receives the service request with multipleQoS class from LCS client, multiple set of (H-/V-) accuracy values per QoS level same as LMF received from LCS client is indicated to LPP location information request procedure.

Proposal 2. If UE receives LPP Request Location Information including multiple QoS, UE should evaluate whether the obtained location estimate fulfils the accompanied accuracy requirements for all the given QoS.

Proposal 3. Once the measured result/ location estimate fulfils any accuracy requirements among indicated ones, UE should report the measurement result/location estimate with the indication of the highest preferred accuracy values among fulfilled ones.

Proposal 4. This proposed operation is only applicable to the UE-based positioning.

Discussion:

Chair asks about the UE implementation: multiple fixes or one? Samsung indicate one fix is expected.

Huawei understand that the UE performs as many measurements as it can within the delay budget, obtains a location estimate, maps the result to a certain QoS class, and reports with that QoS class. They understand that this came from the alternative QoS for UP transport.

Qualcomm think the multiple QoS class is confusing in the context of LPP, because QoS also includes response time. They understand that P1 is phrased from the LMF point of view but does not match how it would be specified in LPP. After looking at the LCS-AP signalling, they think multiple QoS is not currently there. They think the LMF can receive multiple QoS with different levels and translate them into desired accuracy; there could be multiple desired accuracy values, up to LMF implementation to request, but this does not necessarily map to the multiple QoS feature. So they think we just need to introduce min and max accuracy values, and the LMF can map the results to an appropriate QoS class.

Xiaomi understand the multiple QoS from LCS results in the LMF selecting one QoS class to send to the UE, and multiple QoS to the UE is not needed.

Intel share the same view as Qualcomm, that from LMF perspective it asks the UE to provide a measurement result and maps this to different QoS level. From UE side they understand that the UE will report whatever it measures, so they think we already have support for the multiple QoS feature requested by SA2.

Ericsson point out that we are talking about UE-based, where the UE does not provide measurement results as such. They understand that if the UE does not meet the related accuracy, it will not indicate what level of accuracy was met. They would be OK to look into the stage 3 details a bit more, but they do not see complications.

Qualcomm point out that the UE reports a location estimate together with the accuracy, and they see that this should also be sufficient for this feature. They think the potentially useful aspect would be providing multiple accuracy values, but they think a min and max would be enough. They also see that a capability would be needed.

Nokia do not see the use; the LCS client should be clear about its QoS requirements, and this looks like an LCS client that cannot make up its mind. Qualcomm agree and wonder what the UE would be expected to do differently.

Chair understands the SA2 feature calls for the LMF to do multiple sessions; Qualcomm understand that this would be with different positioning methods.

Huawei think we have been talking from the LMF side, but Samsung’s proposal affects the UE behaviour; the UE would do its best to take the measurements, and the number of measurements is affected by the QoS class. They think the benefit is clear.

OPPO do not see that there is a big difference between the implementation described by Huawei and best-effort QoS. Huawei note that there is no best-effort QoS in LPP, only in the service layer.

Intel think the key issue is whether the response time requirement is different for different QoS classes; if it is the same, then from the UE side they do not see the use of the proposal, but if the response time is different, we need to think about that case.

Samsung agree with Huawei’s comment that best-effort QoS is not visible in LPP; the difference here is that there is some certified QoS value indicated in the service layer.

Chair wonders if it is functionally different from having a minimum and a maximum accuracy. Huawei think we could take a WA to introduce the feature and work out the details.

Ericsson think the multiple QoS classes could help the UE to infer the minimum and maximum accuracy. They understand that Qualcomm prefer not to indicate which QoS class was met, but they think the UE can return something between the minimum and maximum.

Intel are unsure of the purpose of a minimum accuracy requirement; will the UE not report anything if it cannot meet the minimum accuracy requirement, or will it report what it can achieve?

Qualcomm indicate that today the UE does its best to measure, reports what it achieved, and the network maps it to a QoS class. If we indicate a range, a lazy UE could stop at the lowest value. They think we need to understand the UE impact better and whether there is a reason to introduce the feature into LPP.

Intel think we could agree that we target to support multiple QoS, but we need further discussion on whether something is needed in LPP to do that.

Agreement:

RAN2 intend to align with SA2’s multiple QoS feature. FFS level of LPP impact.

Relay bit rate recommendation

[R2-2306516](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202305%20-%20RAN2_122,%20Incheon\Extracts\R2-2306516_Considerations%20on%20voice%20and%20video%20support%20for%20Relays.docx) Considerations on voice and video support for Relays Philips International B.V., MediaTek, Vivo, FirstNet, KPN, TNO, Kyocera discussion Rel-18 NR\_SL\_relay-Core R2-2200413

Withdrawn/Not available

R2-2306146 Introduction of ‘multiple QoS’ class in positioning Samsung R&D Institute UK discussion Withdrawn

## 7.25 R18 Other

Specific items may be allocated to a breakout session for treatment.

Impacts from Other RAN WGs and TSGs that has no separate TU budget in RAN2. LS ins for Rel-18 specific WIs/SIs that has no RAN WI.

Time budget: 2 TU

Tdoc Limitation: -

### 7.25.3 Other

RAN3, SA2, SA3, CT1 led items and others, e.g. eNPN

[R2-2305345](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202305 - RAN2_122, Incheon\\Extracts\\R2-2305345 Draft CR of new location information type for PRU.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202305 - RAN2_122, Incheon\Extracts\R2-2305345 Draft CR of new location information type for PRU.docx) Draft CR of new location information type for PRU vivo draftCR Rel-18 37.355 17.4.0 5G\_eLCS\_Ph3

[R2-2306024](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202305 - RAN2_122, Incheon\\Extracts\\R2-2306024 PRU.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202305 - RAN2_122, Incheon\Extracts\R2-2306024 PRU.docx) On the Positioning Reference Units aspects Ericsson discussion Rel-18