3GPP TSG-RAN WG2 Meeting #121bis-e R2-23xxxxxx

Online, 17-26 April 2023

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# 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.

* [AT121bis-e][407][POS] LTE positioning corrections (CATT)

Scope: Check the CRs in agenda item 4.4: R2-2302625 / R2-2302626 / R2-2302627 / R2-2302628 / R2-2302629 / R2-2302630 / R2-2302631 / R2-2302632 / R2-2302633 / R2-2302634 / R2-2302635 / R2-2302636.

Intended outcome: Report in R2-2304282 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304282](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304282%20Report%20of%20%5bOffline-407%5d%5bPOS%5d%20LTE%20positioning%20corrections%20(CATT).docx) LTE positioning corrections (CATT) CATT discussion Rel-15

* Revised in R2-2304509 (email discussion [AT121bis-e][407])

R2-2304509 LTE positioning corrections (CATT) CATT discussion Rel-15

* Noted (email discussion [AT121bis-e][407])

[R2-2302625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302625_37355_CR0419_(Rel-15).docx) Miscellaneous Corrections on Section 4 Functionality of Protocol in TS 37.355 CATT CR Rel-15 37.355 15.3.0 0419 - F LCS\_LTE\_acc\_enh

* Revised in R2-2304476 (email discussion [AT121bis-e][407])

R2-2304476 Miscellaneous Corrections on Section 4 Functionality of Protocol in TS 37.355 CATT CR

Rel-15 37.355 15.3.0 0419 1 F NR\_newRAT-Core

* Not provided (changes only from Rel-17, per email discussion [AT121bis-e][407])

[R2-2302626](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302626_37355_CR0420_(Rel-16).docx) Miscellaneous Corrections on Section 4 Functionality of Protocol in TS 37.355 CATT CR Rel-16 37.355 16.10.0 0420 - A LCS\_LTE\_acc\_enh

* Revised in R2-2304477 (email discussion [AT121bis-e][407])

R2-2304477 Miscellaneous Corrections on Section 4 Functionality of Protocol in TS 37.355 CATT CR Rel-16 37.355 16.10.0 0420 1 A NR\_newRAT-Core

* Not provided (changes only from Rel-17, per email discussion [AT121bis-e][407])

[R2-2302627](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302627_37355_CR0421_(Rel-17).docx) Miscellaneous Corrections on Section 4 Functionality of Protocol in TS 37.355 CATT CR Rel-17 37.355 17.4.0 0421 - A LCS\_LTE\_acc\_enh

* Revised in R2-2304478 (email discussion [AT121bis-e][407])

R2-2304478 Miscellaneous Corrections on Section 4 Functionality of Protocol in TS 37.355 CATT CR Rel-17 37.355 17.4.0 0421 1 A NR\_newRAT-Core

* Not provided (change 1 is merged into R2-2304520, per email discussion [AT121bis-e][407])

[R2-2302628](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302628_37355_CR0422_(Rel-15).docx) Miscellaneous Corrections on Section 5 LPP Procedures in TS 37.355 CATT CR Rel-15 37.355 15.3.0 0422 - F LCS\_LTE\_acc\_enh

* Not pursued (email discussion [AT121bis-e][407])

[R2-2302629](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302629_37355_CR0423_(Rel-16).docx) Miscellaneous Corrections on Section 5 LPP Procedures in TS 37.355 CATT CR Rel-16 37.355 16.10.0 0423 - A LCS\_LTE\_acc\_enh

* Not pursued (email discussion [AT121bis-e][407])

[R2-2302630](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302630_37355_CR0424_(Rel-17).docx) Miscellaneous Corrections on Section 5 LPP Procedures in TS 37.355 CATT CR Rel-17 37.355 17.4.0 0424 - A LCS\_LTE\_acc\_enh

* Not pursued (email discussion [AT121bis-e][407])

[R2-2302631](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302631_37355_CR0425_(Rel-15).docx) Corrections on the descriptions in Positioning methods IEs CATT CR Rel-15 37.355 15.3.0 0425 - F LCS\_LTE\_acc\_enh

* Not pursued (changes only from Rel-17, per email discussion [AT121bis-e][407])

[R2-2302632](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302632_37355_CR0426_(Rel-16).docx) Corrections on the descriptions in Positioning methods IEs CATT CR Rel-16 37.355 16.10.0 0426 - A LCS\_LTE\_acc\_enh

* Not pursued (changes only from Rel-17, per email discussion [AT121bis-e][407])

[R2-2302633](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302633_37355_CR0427_(Rel-17).docx) Corrections on the descriptions in Positioning methods IEs CATT CR Rel-17 37.355 17.4.0 0427 - A LCS\_LTE\_acc\_enh

* Merged into R2-2304520 (email discussion [AT121bis-e][407])

[R2-2302634](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302634_37355_CR0428_(Rel-15).docx) Corrections on positioning assistance data transfer CATT CR Rel-15 37.355 15.3.0 0428 - F LCS\_LTE\_acc\_enh

* Not pursued (email discussion [AT121bis-e][407])

[R2-2302635](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302635_37355_CR0429_(Rel-16).docx) Corrections on positioning assistance data transfer CATT CR Rel-16 37.355 16.10.0 0429 - A LCS\_LTE\_acc\_enh

* Not pursued (email discussion [AT121bis-e][407])

[R2-2302636](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302636_37355_CR0430_(Rel-17).docx) Corrections on positioning assistance data transfer CATT CR Rel-17 37.355 17.4.0 0430 - A LCS\_LTE\_acc\_enh

* Not pursued (email discussion [AT121bis-e][407])

[R2-2304520](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304520_37355r1_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 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][407]; see also conclusion of R2-2302639 under email discussion [AT121bis-e][427])

# 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.

### 5.3.1 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.

Yaw and APC (handled by email)

[R2-2303030](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303030%20-%20Yaw%20and%20APC%20clarifications.docx) Yaw and APC clarifications for SSR positioning Swift Navigation, Ericsson discussion Rel-16 NR\_pos-Core

[R2-2303658](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303658_GNSS_PCOandPCVerrorAnalysis.docx) GNSS PCO and PCV error analysis u-blox AG discussion Rel-16 38.305

* [AT121bis-e][408][POS] Yaw and APC (Swift)

Scope: Check the proposals in R2-2303030 and R2-2303658, merge if necessary, and conclude on the needed changes. Also progress the related discussion from the TEI18 proposal in R2-2303033 and attempt to converge to agreeable CRs

Intended outcome: Report in R2-2304283, agreed Rel-16/17 CRs (without CB if possible), agreeable Rel-18 CRs

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304283](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202304 - RAN2_121bis-e, Online\\Extracts\\R2-2304283 - [AT121bis-e][408][POS] Yaw and APC (Swift)_SUMMARY.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202304 - RAN2_121bis-e, Online\Extracts\R2-2304283 - [AT121bis-e][408][POS] Yaw and APC (Swift)_SUMMARY.docx) [AT121bis-e][408][POS] Yaw and APC (Swift) Swift Navigation discussion Rel-16 NR\_pos-Core

* Noted (email discussion [AT121bis-e][408])

[R2-2304308](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304308_36305_(0113)_R15_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-15 36.305 15.5.0 0113 - F NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304309](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304309_36305_(0114)_R16_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 36.305 16.4.0 0114 - A NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304310](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304310_36305_(0115)_R17_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 36.305 17.2.0 0115 - A NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304311](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304311_38305_(0129)_R15_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-15 38.305 15.9.0 0129 - F NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304312](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304312_38305_(0130)_R16_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 38.305 16.8.0 0130 - A NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304313](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304313_38305_(0131)_R17_APC.docx) APC clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 38.305 17.4.0 0131 - A NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304314](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304314_36305_(0116)_R16_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 36.305 16.4.0 0116 - F NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304315](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304315_36305_(0117)_R17_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 36.305 17.2.0 0117 - A NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304316](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304316_38305_(0132)_R16_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-16 38.305 16.8.0 0132 - F NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

[R2-2304317](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304317_38305_(0133)_R17_Yaw.docx) Zero Yaw clarification for SSR positioning Swift Navigation, Ericsson CR Rel-17 38.305 17.4.0 0133 - A NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][408])

RTCM LS (handled by email)

[R2-2304044](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304044%20LSTtoRTCM.docx) LS on SSR orbit and clock correction reference for BDS in 3GPP LPP Ericsson LS out Rel-16 To:RTCM SC 104

* Approved (email discussion [AT121bis-e][409])

[R2-2304045](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304045%20ReportRTCM.docx) Report from [Post121][401][POS] LS to RTCM on SSR orbit and clock correction reference for BDS (Ericsson) Ericsson report Rel-16

* Noted (email discussion [AT121bis-e][409])
* [AT121bis-e][409][POS] LS to RTCM (Ericsson)

Scope: Review the draft LS in R2-2304044 in light of the email discussion report in R2-2304045 and develop an approvable version.

Intended outcome: Report in R2-2304284 and approved LS (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304284](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304284%20%5bAT121bis-e%5d%5b409%5d%5bPOS%5d%20LS%20to%20RTCM%20(Ericsson)%20-%20Rapp.docx) [AT121bis-e][409][POS] LS to RTCM (Ericsson) Ericsson report Rel-16

* Noted (email discussion [AT121bis-e][409])

Not available/withdrawn

R2-2303032 Zero Yaw and APC clarifications for SSR positioning Swift Navigation draftCR Rel-16 38.305 16.8.0 F NR\_pos-Core Withdrawn

### 5.3.2 RRC corrections

Including impact to 36.331, 38.331, and 38.306.

* [AT121bis-e][410][POS] Rel-15/16 positioning stage 3 CRs (ZTE)

Scope: Check the CRs from agenda items 5.3.2, 5.3.3, and 5.3.4: R2-2302985 / R2-2302986 / R2-2302989 / R2-2302990 / R2-2304046 / R2-2304047 / R2-2304048 / R2-2303501 / R2-2303502.

Intended outcome: Report in R2-2304285 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304285](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304285%20Summary%20of%20Rel-1516%20positioning%20stage%203%20CRs.docx) Rel-15/16 positioning stage 3 CRs ZTE Corporation discussion Rel-16 NR\_pos-Core

Handled by email

[R2-2302985](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302985%20Correction%20on%20SI%20update%20for%20posSIB-r16.docx) Correction on SI update for posSIB-r16 Huawei, HiSilicon CR Rel-16 38.331 16.12.0 3974 - F NR\_pos-Core

* Agreed in principle (email discussion [AT121bis-e][410])

[R2-2302986](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302986%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 - F NR\_pos-Core, NR\_redcap\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][410])

### 5.3.3 LPP corrections

Handled by email

[R2-2302989](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302989%20Correction%20to%20nr-DL-TDOA-AdditionalMeasurements-r16.docx) Correction to nr-DL-TDOA-AdditionalMeasurements-r16 Huawei, HiSilicon CR Rel-16 37.355 16.10.0 0434 - F NR\_pos-Core

[R2-2302990](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302990%20Correction%20to%20nr-DL-TDOA-AdditionalMeasurements-r17.docx) Correction to nr-DL-TDOA-AdditionalMeasurements-r17 Huawei, HiSilicon CR Rel-17 37.355 17.4.0 0435 - A NR\_pos-Core

* Revised in R2-2304455

[R2-2304455](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304455%20Correction%20to%20nr-DL-TDOA-AdditionalMeasurements.docx) Correction to nr-DL-TDOA-AdditionalMeasurements-r17 Huawei, HiSilicon CR Rel-17 37.355 17.4.0 0435 1 F NR\_pos\_enh-Core

* Postponed (can work with spec rapporteur towards a miscellaneous CR)

[R2-2304046](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304046%20LSbehavRel15.docx) Correction of Location Server behaviour Ericsson CR Rel-15 37.355 15.3.0 0438 - F NR\_newRAT-Core

[R2-2304047](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304047%20LSbehavRel16.docx) Correction of Location Server behaviour Ericsson CR Rel-16 37.355 16.10.0 0439 - A NR\_newRAT-Core

[R2-2304048](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304048%20LSbehavRel17.docx) Correction of Location Server behaviour Ericsson CR Rel-17 37.355 17.4.0 0440 - A NR\_newRAT-Core

* Revised in R2-2304456

[R2-2304456](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304456.docx) Correction of Location Server behaviour Ericsson CR Rel-17 37.355 17.4.0 0440 1 F NR\_pos\_enh-Core

* Postponed (can work with spec rapporteur towards a miscellaneous CR)

### 5.3.4 MAC corrections

Handled by email

[R2-2303501](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303501%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 - F NR\_pos-Core

* Postponed (email discussion [AT121bis-e][410])

[R2-2303502](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303502%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 - A NR\_pos-Core

* Postponed (email discussion [AT121bis-e][410])

# 6 NR Rel-17

## 6.5 NR Sidelink relay

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

Tdoc Limitation: 3 tdocs

### 6.5.1 General and stage 2 corrections

Incoming LSs, etc., and any stage 2 corrections (impact to 38.300).

[R2-2303154](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38300_CR0652_(Rel-17)_R2-2303154-Correction%20on%20direct%20to%20indirect%20path%20switching.docx) Correction on Direct to Indirect Path Switching CATT CR Rel-17 38.300 17.4.0 0652 - F NR\_SL\_relay-Core

[R2-2303155](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38300_CR0653_(Rel-17)_R2-2303155-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 0653 - F NR\_SL\_relay-Core

[R2-2303384](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303384%2038300_Correction_for_NR_sidelink_relay.docx) Miscellaneous corrections for Stage 2 NR sidelink relay Apple CR Rel-17 38.300 17.4.0 0656 - F NR\_SL\_relay-Core

[R2-2303858](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303858%20Corrections%20on%20relay%20(re)selection.docx) Corrections on relay (re)selection ZTE, Sanechips CR Rel-17 38.300 17.4.0 0661 - F NR\_SL\_relay-Core

### 6.5.2 Control plane 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).

Late addition to AI (handle by email)

[R2-2302576](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302576%20-%20Discussion%20on%20paging%20monitoring%20by%20SL%20L2%20U2N%20Relay_V2.docx) Discussion on paging monitoring by SL L2 U2N Relay OPPO discussion Rel-17 NR\_SL\_relay-Core, NR\_redcap-Core, TEI17

* [AT121bis-e][416][Relay] Paging monitoring by L2 relay (OPPO)

Scope: Discuss R2-2302576 and conclude on the proposals.

Intended outcome: Report to CB session in R2-2304291

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304291](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304291%20-%20Summary%20of%20%5bAT121bis-e%5d%5b416%5d%20Relay%20Paging%20monitoring%20by%20L2%20relay%20(OPPO)_final.doc) [AT121bis-e][416][Relay] Paging monitoring by L2 relay (OPPO) OPPO discussion Rel-17 NR\_SL\_relay-Core, NR\_redcap-Core, TEI17

Proposal 1 RAN2 not pursue further work to enable L2 U2N SL Relay UE paging monitoring for L2 Remote UE using i\_s as for RRC\_IDLE state in Rel-17.

Proposal 2 RAN2 not pursue further work to enable L2 U2N SL Relay UE paging monitoring for L2 Remote UE using the eDRX paging cycle in Rel-17.

Discussion:

Ericsson wonder if there is spec impact. Apple understand there is not.

Agreements:

RAN2 not pursue further work to enable L2 U2N SL Relay UE paging monitoring for L2 Remote UE using i\_s as for RRC\_IDLE state in Rel-17.

RAN2 not pursue further work to enable L2 U2N SL Relay UE paging monitoring for L2 Remote UE using the eDRX paging cycle in Rel-17.

Rapporteur summary

[R2-2304189](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304189%20%5bPre121bis-e%5d%5b401%5d%5bRelay%5d%20Summary%20of%20agenda%20item%206.5.2.docx) Summary of agenda item 6.5.2 on control plane corrections (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

Proposal 1: RAN2 confirm that forwarding paging cause by L2 U2N Relay UE is not supported in Rel-17.

Proposal 2: R2-2303115 is not pursued.

Proposal 3: The changes in R2-2303156 are agreeable, and can be merged into RRC miscellaneous CR.

Proposal 4: The changes in R2-2303175 are agreeable, and can be merged into RRC miscellaneous CR.

Proposal 5: Then change in R2-2303176 is agreeable, and can be merged into RRC miscellaneous CR.

Proposal 6: The change in R2-2303337 is agreeable, and can be merged into RRC miscellaneous CR.

Proposal 7: R2-2303338 is not pursued.

Proposal 8: Change #1, Change #4 and the first two sentence of change #3 in R2-2303385 are agreeable, and can be merged into RRC miscellaneous CR.

Proposal 9: RAN2 agree that “the SRAP configuration used for the SRB1” is to be removed from the field description of SL-L2RemoteUE-Config of RRCReestablishment message.

Proposal 10: The 38.304 CR in R2-2303489 is agreeable.

Proposal 11: The first change of adding separations between conditional “or”s in R2-2303656 is agreeable and can be merged into RRC miscellaneous CR.

Proposal 12: The changes in R2-2303739 are agreeable, and can be merged into RRC miscellaneous CR.

Proposal 13: RAN2 agree that “is” is to be replaced by “was” in the sentence “the UE is acting as L2 U2N Remote UE for the destination” in clause 5.8.9.3.

Proposal 14: The intention of R2-2303983 is agreeable. RAN2 to discuss whether to add a NOTE in 5.2.2.4.2, to clarify upon reception of the SIB1, a L2 U2N Remote UE can disregard the Uu L1 UL/DL configurations of the serving cell.

Proposal 15: R2-2304066 is not pursued.

* [AT121bis-e][425][Relay] Rel-17 relay CP CRs (Huawei)

Scope: Check the proposals from R2-2304189 and conclude on the CRs. Can produce a merged CR for minor changes.

Intended outcome: Report to CB session in R2-2304299 and agreeable CRs

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304299](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304299%20Report%20of%20%5bAT121bis-e%5d%5b425%5d%5bRelay%5d.docx) Report of [AT121bis-e][425][Relay] Rel-17 relay CP CRs (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay-Core

[Miscellaneous CR, to be checked under R2-2304466]

Proposal 1: The following changes are agreeable, and can be merged into RRC miscellaneous CR.

‐ The changes in R2-2303156, R2-2303175, R2-2303176, R2-2303337, R2-2303739,

‐ Change #1, Change #4 and the first two sentence of change #3 in R2-2303385,

‐ Change#1 of adding separations between conditional “or”s in R2-2303656

Proposal 8: Agree the change from “The network configures only the SRAP configuration used for the SRB1 and local UE ID” to “The network configures only the SRAP configuration for local UE ID” in the field description of SL-L2RemoteUE-Config of RRCReestablishment message, which can be merged into RRC miscellaneous CR.

[Document dispositions]

Proposal 2: The change in R2-2303922 is postponed.

Proposal 3: The changes in R2-2303489 is agreeable. In addition, the CR is revised to fix the errors raised by Apple, i.e. change SL-V2X-PreconfigurationNR to SL-PreconfigurationNR.

Proposal 6: The CR in R2-2303983 is postponed.

Proposal 7: R2-2303338 is not pursued.

Proposal 9: R2-2304066 is not pursued. Can discuss whether to clarify in RRC spec that idle/inactive UE cannot perform discovery when network does not support discovery (i.e. sl-L2U2N-Relay-r17, sl-L3U2N-RelayDiscovery and sl-NonRelayDiscovery is not included in SIB12) in next meeting.

Discussion:

OPPO think the cover sheet in R2-2303489 needs to be fixed to reflect sidelink as well as relay.

Agreements:

P1/P8/P2/P6/P7/P9 are agreed.

P3 is agreed, i.e., R2-2304467 is agreed in principle with the change of WI to add sidelink, as R2-2304508.

[Substantive proposals]

Proposal 4: Forwarding paging cause by L2 U2N Relay UE is not supported in Rel-17.

Proposal 5: Relay UE’s RRC reconfiguration failure does not trigger notification message.

Agreements:

Forwarding paging cause by L2 U2N Relay UE is not supported in Rel-17.

Relay UE’s RRC reconfiguration failure does not trigger notification message.

[R2-2304466](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38331_CR4064_(Rel-17)_R2-2304466%20Miscellaneous%20corrections%20for%20SL%20relay.docx) Miscellaneous corrections for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4064 - F NR\_SL\_relay-Core

* Agreed in principle

The following documents will not be individually treated

[R2-2302593](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302593_Corrections%20to%20paging%20monitoring%20via%20Relay%20UE.doc) Corrections to paging monitoring via Relay UE Samsung Electronics Co., Ltd discussion Rel-17 NR\_SL\_relay-Core

[R2-2302594](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302594_38.331_CR_Corrections%20to%20paging%20monitoring%20via%20Relay%20UE.docx) 38.331\_CR\_Corrections to paging monitoring via Relay UE Samsung Electronics Co., Ltd CR Rel-17 38.331 17.4.0 3949 - F NR\_SL\_relay-Core

[R2-2303115](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303115.docx) Correction on 38.331 Xiaomi CR Rel-17 38.331 17.4.0 3985 - F NR\_SL\_relay-Core

[R2-2303156](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38331_CR3992_(Rel-17)_R2-2303156-Corrections%20on%20the%20Field%20Description%20of%20Common%20Resource%20Pool.docx) Correction on Field Description of Common Resource Pool CATT CR Rel-17 38.331 17.4.0 3992 - F NR\_SL\_relay-Core

[R2-2303175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303175%20Miscellaneous%20Corrections%20to%20TS%2038.331%20for%20SL%20relay.docx) Miscellaneous corrections to TS 38.331 for SL relay ZTE, Sanechips CR Rel-17 38.331 17.4.0 3996 - F NR\_SL\_relay-Core

[R2-2303176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303176%20Corrections%20on%20sorting%20quantity%20for%20Event%20X1%20for%20SL%20relay.docx) Corrections on sorting quantity for Event X1 for SL relay ZTE, Sanechips CR Rel-17 38.331 17.4.0 3997 - F NR\_SL\_relay-Core

[R2-2303337](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38331_CR4007_(Rel-17)_R2-2303337_Correction%20on%20PC5%20RLC%20channel%20release%20trigger%20due%20to%20SL%20RLF.docx) Correction on PC5 RLC channel release trigger due to SL RLF vivo CR Rel-17 38.331 17.4.0 4006 - F NR\_SL\_relay-Core

[R2-2303338](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38331_CR4006_(Rel-17)_R2-2303338_Correction%20on%20SRB0%20handling%20when%20UE%20is%20acting%20as%20L2%20U2N%20Remote%20UE.docx) Correction on SRB0 handling when UE is acting as L2 U2N Remote UE vivo CR Rel-17 38.331 17.4.0 4007 - F NR\_SL\_relay-Core

[R2-2303385](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303385%2038331_Correction_L2%20relay.docx) Corrections on UE handling of Layer 2 UE-to-NW relay configurations Apple CR Rel-17 38.331 17.4.0 4009 - F NR\_SL\_relay-Core

[R2-2303386](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303386%20Discussion%20on%20SRAP%20config%20in%20RRCRestablishment%20.doc) Discussion on SRAP configuration in RRCReestablishment Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2303489](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38304_CR0333_(Rel-17)_R2-2303489%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 - F NR\_SL\_relay-Core

* Revised in R2-2304467 (email discussion [AT121bis-e][425])

[R2-2304467](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38304_CR0333r1_(Rel-17)_R2-2304467%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 1 F NR\_SL\_relay-Core

[R2-2303656](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303656%20Miscellaneous%20corrections%20to%2038331.docx) Miscellaneous corrections to 38331 Nokia, Nokia Shanghai Bell draftCR Rel-17 38.331 17.4.0 D NR\_SL\_relay-Core

[R2-2303739](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Docs\R2-2303739.zip) Correction on L2 U2N Relay Remote UE RRC procedure Philips International B.V. CR Rel-17 38.331 17.4.0 4024 - F NR\_SL\_relay-Core

[R2-2303922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303922_CR4038_Correction%20on%20role%20of%20a%20L2%20U2N%20Remote%20UE.docx) Correction on role of a L2 U2N Remote UE ASUSTeK CR Rel-17 38.331 17.4.0 4038 - F NR\_SL\_relay-Core

[R2-2303983](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303983.docx) Correction on remote UE’s behavior upon SIB1 reception Xiaomi CR Rel-17 38.331 17.4.0 4045 - F NR\_SL\_relay-Core

[R2-2304066](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304066%20-%2038.331_CR4048_Rel17_Correction%20on%20Cell%20Barring%20for%20L2%20U2N%20Remote%20UE.docx) Correction on Cell Barring for L2 U2N Remote UE Ericsson España S.A. CR Rel-17 38.331 17.4.0 4048 - F NR\_SL\_relay-Core

### 6.5.3 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).

Summary document

[R2-2304191](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304191%20%5bPre121bis-e%5d%5b402%5d%5bRelay%5d%20Summary%20of%20agenda%20item%206.5.3.doc) Summary of agenda item 6.5.3 (Samsung) Samsung discussion Rel-17 NR\_SL\_relay-Core

PDCP CR:

Proposal 1. The 38.323 CR in R2-2303490 is agreeable.

RLC CR:

Proposal 2. The 38.322 CR in R2-2303491 is agreeable.

SRAP CR:

Proposal 3. The 38.351 CR in R2-2304036 is agreeable.

Proposal 4. If proposal 3 is agreed, RAN2 to discuss the proposed text change in clause 5.2.2.2 in 38.351.

- else if the SRAP Data PDU is for SRB1 and if there is not an entry in sl-SRAP-ConfigRelay, whose sl-RemoteUE-RB-Identity matches the SRB identity of the SRAP Data PDU, or if there is an entry in sl-SRAP-ConfigRelay without the corresponding sl-EgressRLC-ChannelPC5:

- Determine the egress PC5 Relay RLC channel in the determined egress link corresponding to logicalChannelIdentity for SL-RLC1 as specified in TS 38.331 [3];

The following documents will not be individually treated

[R2-2303490](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38323_CR0123_(Rel-17)_R2-2303490%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 - F NR\_SL\_relay-Core

* Agreed in principle

[R2-2303491](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38322_CR0052_(Rel-17)_R2-2303491%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 - F NR\_SL\_relay-Core

* Agreed in principle

[R2-2304036](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304036_Corrections%20on%20SRAP%20for%20SL%20relay.docx) Corrections on SRAP for SL relay NEC CR Rel-17 38.351 17.4.0 0020 - F NR\_SL\_relay-Core

* Revised in R2-2304480 (email discussion [AT121bis-e][426])

[R2-2304480](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38.351_CR0020_R2-2304480%20Corrections%20on%20SRAP%20for%20SL%20relay.docx) Corrections on SRAP for SL relay NEC CR Rel-17 38.351 17.4.0 0020 1 F NR\_SL\_relay-Core

* Agreed in principle (email discussion [AT121bis-e][426])
* [AT121bis-e][426][Relay] Rel-17 relay UP CR (Samsung)

Scope: Check the CR in R2-2304036 and determine whether/how to integrate the TP from P4 of R2-2304191

Intended outcome: Report in R2-2304479 and agreed CR (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304479](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304479%20%5bAT121bis-e%5d%5b426%5d%5bRelay%5d%20Summary%20of%20Relay%20UP.doc) Summary of Relay-17 relay UP CR (Samsung) Samsung discussion Rel-17 NR\_SL\_relay-Core

* Noted (email discussion [AT121bis-e][426])

Not available/withdrawn

R2-2302974 Corrections on SRAP for SL relay NEC Corporation CR Rel-17 38.351 17.4.0 0019 - F NR\_SL\_relay-Core Withdrawn

## 6.7 NR positioning enhancements

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

Tdoc Limitation: 4 tdocs

### 6.7.1 General and stage 2 corrections

Handled by email

Incoming LS with “take into account” action

[R2-2302429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302429_R4-2303244.docx) Reply LS on applicability of timing error margin of Rx TEG (R4-2303244; contact: CATT) RAN4 LS in Rel-17 NR\_pos\_enh-Core To:RAN2 Cc:RAN1, RAN3

* Noted (email discussion [AT121bis-e][400])

Incoming LS and draft reply

[R2-2302404](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302404_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

* Postponed (email discussion [AT121bis-e][417]]

[R2-2304178](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304178%20Reply%20LS%20on%20GNSS%20integrity%20requirement%20parameters%20definition.docx) Draft Reply LS to CT4 on GNSS integrity requirements Huawei, HiSilicon LS out Rel-17 To:CT4 Cc:SA2 Late

* [AT121bis-e][417][POS] LS on GNSS integrity parameters (Huawei)

Scope: Consider the LS in R2-2302404 and draft a reply.

Intended outcome: Report in R2-2304292 and approvable LS in R2-2304307

Deadline: Friday 2023-04-21 1000 UTC

[R2-2304292](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304292%20Reply%20LS%20on%20GNSS%20integrity%20parameters.docx) [AT121bis-e][417][POS] LS on GNSS integrity parameters (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

Proposal1: RAN2 to down-select from the following options for the reply LS to CT4/SA2 on GNSS integrity parameters:

 Option1: Revert the agreement in R2-2213320 and reply to CT4/SA2 that TIR is signaled and AL and TTA are not signaled from the LCS client to the LMF

 Option2: Reply to CT4 that current RAN2 specifications support the data structure for TIR; while the data structures for AL and TTA are still under discussion

 Option3: Ask RTCM or ICAO for the data structures of AL and TTA

 Option4: Reply to CT4 that we recommend to adopt the following data structure of AL and TTA

 Option4a, The values for AL, TTA in R2-2212892 as baseline

 Option4b, The values for AL, TTA for the applications considered in Rel-17 can be found in TR 38.857, Table 9.2.4.

Discussion:

Nokia consider that the issue is that AL is not defined in RAN specifications, and they would prefer to take option 1 or 2.

Qualcomm think we should not have sent the previous LS to SA2, and what is signalled between the LCS client and the LMF is not in RAN2 scope. They think we can indicate option 4b and this is all that is available.

Chair suggests downselecting to options 2 and 4b.

CATT prefer to stick to the conclusion that there is no impact to LPP, whatever we reply. They think option 4b is acceptable.

Intel are OK with option 4b.

Nokia are not sure if CT4 know all the background information they need, and they think option 4b is strange because of asking another group to refer to a TR. They can accept 4b.

Huawei have some concern about the AL range, which they think should align with the PL.

Agreements:

Reply LS is postponed to next meeting.

Proposal2: if we recommend to adopt the data structure in R2-2212892 as baseline, include in the reply LS the following answer:

Answer: The requested parameters TIR, AL and TTA are represented as follows

- TIR, representation adopted from TS 37.355, IE TargetIntegrityRisk-r17 of IE CommonIEsRequestLocationInformation, which is represented as INTEGER (10..90), where the TIR is calculated by P=10-0.1n [hour-1] where n is the value of targetIntegrityRisk and the range is 10-1 to 10-9 per hour.

- Alert Limit, separated into a horizontal and vertical alert limit, with a value range adopted from horizontal and vertical protection level attributes in TR.37.355 and the IE IntegrityInfo-r17 of the IE CommonIEsProvideLocationInformation, which contains the following fields, scale factor 0.01 meters

o horizontalProtectionLevel-r17 INTEGER (0..50000)

o verticalProtectionLevel-r17 INTEGER (0..50000)

- Time to alert representation can be adopted from the TR 38.857, Table 9.2.4, where TTAs are listed in different use cases from 100ms to 30s. In order to allow some wider TTAs, the recommended value range is INTEGER (1..2000), scale factor 0.1 s.

R2-2304307 Draft Reply LS to CT4 on GNSS integrity requirements Huawei, HiSilicon LS out Rel-17 To:CT4 Cc:SA2

* Not provided (reply is postponed per email discussion [AT121bis-e][417])

Stage 2 proposals

[R2-2302637](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302637_38305_CR0123_(Rel-17).docx) Miscellaneous corrections on 38.305 CATT CR Rel-17 38.305 17.4.0 0123 - F NR\_pos\_enh-Core

* Revised in R2-2304516 (email discussion [AT121bis-e][411])

[R2-2304516](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304516_38305_CR0123r1_(Rel-17).docx) Miscellaneous corrections on 38.305 CATT CR Rel-17 38.305 17.4.0 0123 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][411])

[R2-2302744](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302744%20Positioning%20stage%202.docx) Stage 2 procedure for deactivation of MG gap and PPW Intel Corporation draftCR Rel-17 38.305 17.4.0 F NR\_pos\_enh-Core

* Revised in R2-2304463 (email discussion [AT121bis-e][411])

[R2-2304463](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304463%20Positioning%20stage%202%20v01-cl.docx) Stage 2 procedure for deactivation of MG gap and PPW Intel Corporation CR Rel-17 38.305 17.4.0 0135 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][411])

[R2-2302993](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302993%20Correction%20to%20UE%20Tx%20TEG%20reporting.docx) Correction to UEPositioningAssistanceInformation Huawei, HiSilicon CR Rel-17 38.305 17.4.0 0124 - F NR\_pos\_enh-Core

* Revised in R2-2304540 (email discussion [AT121bis-e][411])

[R2-2304540](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304540%20Correction%20to%20UE%20Tx%20TEG%20reporting.docx) Correction to UEPositioningAssistanceInformation Huawei, HiSilicon CR Rel-17 38.305 17.4.0 0124 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][411])

[R2-2304052](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304052%20stage2.docx) Update of information transfer from gNB to LMF Ericsson CR Rel-17 38.305 17.4.0 0125 - F NR\_pos\_enh-Core

* Revised in R2-2304457

[R2-2304457](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304457.docx) Update of information transfer from gNB to LMF Ericsson CR Rel-17 38.305 17.4.0 0125 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][411])

[R2-2304053](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304053%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 - F NR\_pos\_enh-Core

* Revised in R2-2304494

[R2-2304494](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304494%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 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][411])

[R2-2304054](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304054%20CR%20to%2038305%20Integrity.docx) Protection Level and Target Integrity Risk Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0127 - F NR\_pos\_enh-Core

* Revised in R2-2304495

[R2-2304495](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304495%20CR%20to%2038305%20Integrity.docx) Protection Level and Target Integrity Risk Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0127 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][411])
* [AT121bis-e][411][POS] Rel-17 positioning stage 2 CRs (Nokia)

Scope: Check the CRs from agenda item 6.7.1: R2-2302637 / R2-2302744 / R2-2302993 / R2-2304052 / R2-2304053 / R2-2304054.

Intended outcome: Report in R2-2304286 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304286](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304286%20Summary%20of%20%5bAT121bis-e%5d%5b411%5d%20Rel-17_Stage-2_CRs_(Nokia)_v01.docx) Offline [AT121bis-e][411] on Rel-17 Positioning Stage-2 CRs Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

* Noted (email discussion [AT121bis-e][411])

### 6.7.2 RRC 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).

[R2-2302638](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302638_38331_CR3956_(Rel-17).docx) Corrections on the figure of UE Positioning Assistance Information procedure CATT CR Rel-17 38.331 17.4.0 3956 - F NR\_pos\_enh-Core

Discussion:

Lenovo think the CR is OK, but they have a minor comment to the figure; they think the message name should be changed to the procedure name to go with the bidirectional arrow. CATT think it aligns with other figures in the RRC spec.

ZTE agree with Lenovo. They also think this is an editorial CR.

* RRCReconfiguration (italics) to be changed to “RRC reconfiguration” (procedure name) in the figure.
* Agreed in principle with this change, as R2-2304281

[R2-2304281](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\38331_CR3956r1_(Rel-17)_R2-2304281.docx) Corrections on the figure of UE Positioning Assistance Information procedure CATT CR Rel-17 38.331 17.4.0 3956 1 F NR\_pos\_enh-Core

* Agreed in principle

[R2-2302992](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302992%20Correction%20to%20UE%20positioning%20assistance%20information.docx) Correction to UE positioning assistance information Huawei, HiSilicon CR Rel-17 38.331 17.4.0 3976 - F NR\_pos\_enh-Core

Discussion:

vivo think the change is not necessary, because the action is captured in the next clause.

ZTE also think it is not necessary. Ericsson and Lenovo agree with vivo.

Samsung understand the motivation, but they think it would be better placed in 5.3.5.3 on reception of the RRCReconfiguration.

Huawei indicate the main intention is to establish a common understanding between the UE and the gNB of when the period starts.

CATT also think the CR is not necessary and duplicates functionality from 5.7.14.3.

Intel agree with the CR and think we have similar language for periodic measurements.

Nokia think the current text is not very clear and some clarification might be needed before taking a CR like this. The point is that when the request comes in, the first report is sent as in the one-shot case, followed by periodic repetitions.

* Not pursued (related issue can be further investigated)

### 6.7.3 LPP 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).

Rapporteur summary

[R2-2304192](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304192_(Summary%20of%20AI%206.7.3%20(LPP))_v1.docx) Summary of AI 6.7.3 - NR positioning enhancements, LPP corrections Qualcomm Incorporated discussion Rel-17 NR\_pos\_enh-Core

Proposal 1: The CR in "R2-2302639, "Corrections on applicability of timing error margin of RxTEG in NR-Multi-RTT-SignalMeasurementInformation field descriptions", CATT" is an essential correction.

Proposal 2: The CR in "R2-2302884, "Miscellaneous corrections on LPP", Lenovo" is an essential correction.

Proposal 3: RAN2 to discuss and decide whether the CR in "R2-2302987, "Correction to PRS validity area", Huawei, HiSilicon." is an essential correction or not, in particular:

- Should the "lower/receiving/decoding layer" deliver only the ProvideAssistanceData message (instance) to "upper/positioning layer" which is valid for the cell where the UE currently camps on (instead of providing all received ProvideAssistanceData messages (instances))?

Proposal 4: RAN2 to discuss and decide whether the CR in "R2-2304051, "Missing finer periodicities than 1s", Ericsson." is an essential corrections or not, including the following aspects:

- Is a finer granularity for the periodic reporting intervals missing?

- If yes, which values are missing?

- If yes, are these missing values applicable to all LPP positioning methods?

Proposal 5: The CR in R2-2304056, "LOS-NLOS-Indicator Types", Nokia, Nokia Shanghai Bell. is not an essential correction.

Proposal 6: The CR in "R2-2304139, "Use of nr-DL-PRS-ExpectedAoD-or-AoA assistance by UE", Nokia, Nokia Shanghai Bell" is not an essential correction.

The following documents will not be individually treated

[R2-2302639](file:///C:\\Users\\mtk16923\\Documents\\3GPP%20Meetings\\202304%20-%20RAN2_121bis-e,%20Online\\Extracts\\R2-2302639_37355_CR0431_(Rel-17).docx" \o "C:Usersmtk16923Documents3GPP Meetings202304 - RAN2_121bis-e, OnlineExtractsR2-2302639_37355_CR0431_(Rel-17).docx) Corrections on applicability of timing error margin of RxTEG in NR-Multi-RTT-SignalMeasurementInformation field descriptions CATT CR Rel-17 37.355 17.4.0 0431 - F NR\_pos\_enh-Core

* Revised in R2-2304520 (email discussion [AT121bis-e][427]; see also conclusions of discussion [AT121bis-e][407])

[R2-2302884](file:///C:\\Users\\mtk16923\\Documents\\3GPP%20Meetings\\202304%20-%20RAN2_121bis-e,%20Online\\Extracts\\R2-2302884%20Misc%20LPP%20corrections%20R17%2037355.docx" \o "C:Usersmtk16923Documents3GPP Meetings202304 - RAN2_121bis-e, OnlineExtractsR2-2302884 Misc LPP corrections R17 37355.docx) Miscellaneous corrections on LPP Lenovo CR Rel-17 37.355 17.4.0 0432 - F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][427])

[R2-2302987](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302987%20Correction%20to%20PRS%20validity%20area.docx) Correction to PRS validity area Huawei, HiSilicon CR Rel-17 37.355 17.4.0 0433 - F NR\_pos\_enh-Core

* Not pursued (email discussion [At121bis-e][427])

[R2-2304050](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304050%20PeriodicD.docx) Missing LPP support for sub 1s location information reporting periodicity Ericsson discussion Rel-17

[R2-2304051](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304051%20PeriodicCR.docx) Missing finer periodicities than 1s Ericsson CR Rel-17 37.355 17.4.0 0441 - F NR\_pos\_enh-Core

* Not pursued (email discussion [AT121bis-e][427]; related issue can be further investigated)

[R2-2304056](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304056%20CR%20to%2037355%20LOS-NLOS%20Indicator.docx) LOS-NLOS-Indicator Types Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.4.0 0442 - F NR\_pos\_enh-Core

* Revised in R2-2304496 (email discussion [AT121bis-e][427])

[R2-2304496](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304496%20CR%20to%2037355%20LOS-NLOS%20Indicator_v02.docx) LOS-NLOS-Indicator Types Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.4.0 0442 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][427])

[R2-2304139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304139%20CR%20to%2037355%20ExpectedAoA.docx) Use of nr-DL-PRS-ExpectedAoD-or-AoA assistance by UE Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.4.0 0443 - F NR\_pos\_enh-Core

* Not pursued (email discussion [AT121bis-e][427])
* [AT121bis-e][427][POS] Rel-17 LPP CRs (Qualcomm)

Scope: Check the CRs in agenda item 6.7.3 and R2-2302745.

Intended outcome: Report in R2-2304300 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304300](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304300_(%5bAT121bis-e%5d%5b427%5d%5bPOS%5d%20Rel-17%20LPP%20CRs)_Summary.docx) Summary of [AT121bis-e][427][POS] Rel-17 LPP CRs Qualcomm Incorporated discussion Rel-18 NR\_pos\_enh-Core

* Noted (email discussion [AT121bis-e][427])

Not available/withdrawn

R2-2304055 Use of nr-DL-PRS-ExpectedAoD-or-AoA assistance by UE Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.4.0 0128 - F NR\_pos\_enh-Core Withdrawn

### 6.7.4 MAC 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).

[R2-2302991](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302991%20Correction%20to%20posSRS%20transmission%20in%20RRC_INACTIVE.docx) Correction to posSRS transmission in RRC\_INACTIVE Huawei, HiSilicon CR Rel-17 38.321 17.4.0 1581 - F NR\_pos\_enh-Core

Discussion:

Nokia are OK with the CR, but think the wording should be “SP-SRS that is activated according to clause 5.18.17”.

Lenovo are also OK with the CR, but think the addition of the new clause is unclear.

* Postponed

[R2-2304049](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304049%20SRTrigger.docx) Correction for trigger condition of Scheduling Request Ericsson, OPPO CR Rel-17 38.321 17.4.0 1607 - F NR\_pos\_enh-Core

Discussion:

vivo do not think the change is essential, because there are multiple events that trigger SR and most of them have no reference to the clause. Ericsson think in this case everything that is needed is captured in the referred clause.

Huawei think it is an editorial change and can be merged.

OPPO consider that when the PUCCH resource for SR is not configured, the UE needs to RACH.

ZTE agree with vivo that it is not needed.

* Postponed

### 6.7.5 UE capabilities

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).

[R2-2302745](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302745%20Positioning%20capabilities.docx) LPP capability for FGs27-13a,14a and 14-2 Intel Corporation draftCR Rel-17 37.355 17.4.0 F NR\_pos\_enh-Core

* Handled in email discussion [427]
* Revised in R2-2304462 (email discussion [AT121bis-e][427])

[R2-2304462](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304462%20Positioning%20capabilities%20v03-cl.docx) LPP capability for FGs27-13a,14a and 14-2 Intel Corporation CR Rel-17 37.355 17.4.0 0445 - F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT121bis-e][427])

# 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 LSs with RAN2 in Cc:

[R2-2302403](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302403_C1-231129.docx) LS on LPP message and supplementary service event report over a user plane connection between UE and LMF (C1-231129; contact: Ericsson) CT1 LS in Rel-18 5G\_eLCS\_Ph3 To:SA2 Cc:SA3, RAN2, CT4

* Noted (email discussion [AT121bis-e][400])

[R2-2302409](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302409_R1-2302146.docx) LS Reply on PRU Procedures (R1-2302146; contact: Qualcomm) RAN1 LS in Rel-18 NR\_pos\_enh2-Core, 5G\_eLCS\_Ph3 To:SA2 Cc:RAN2, RAN3

* Noted (email discussion [AT121bis-e][400])

Low power or high accuracy (discussed under LPHAP agenda item)

[R2-2302446](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302446_S2-2303414.docx) LS on the requirement on low power or high accuracy positioning (S2-2303414; contact: Huawei) SA2 LS in Rel-18 5G\_eLCS\_Ph3 To:SA1, RAN1, RAN2

* Noted (reply in R2-2304461)

Multiple target UEs (discussed under sidelink positioning agenda item)

[R2-2302448](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302448_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

* Postponed

[R2-2303513](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303513_(Support%20of%20Mutiple%20Target%20UEs%20for%20Sidelink%20Positioning).docx) Support of Multiple Target UEs for Sidelink Positioning Qualcomm Incorporated discussion

PRUs

[R2-2302449](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Docs\R2-2302449.zip) LS on PRU procedures (S2-2303861; contact: Qualcomm) SA2 LS in Rel-18 5G\_eLCS\_Ph3 To:RAN1, RAN2

[R2-2302875](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302875_(PRU%20Response%20LS).docx) PRU Procedures (draft response LS to R2-2301939 (S2-2303861)) Qualcomm Incorporated discussion

[R2-2302957](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302957%20Discussion%20and%20draft%20LS%20reply%20on%20PRU%20procedures.docx) Discussion and draft LS reply on PRU procedures vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303707](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303707%20PRU.docx) On the Positioning Reference Units aspects Ericsson discussion Rel-18

Discussion:

Qualcomm think there is not a lot of divergence in the draft replies.

* [AT121bis-e][421][POS] Reply LS to SA2 on PRU procedures (Qualcomm)

Scope: Draft a reply to R2-2302449, taking related contributions into account.

Intended outcome: Report in R2-2304295 and approved LS (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304295](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304295_%5bAT121bis-e%5d%5b421%5d%5bPOS%5d%20Reply%20LS%20to%20SA2%20on%20PRU%20procedures_Summary.docx) Summary of [AT121bis-e][421][POS] Reply LS to SA2 on PRU procedures Qualcomm Incorporated discussion

* Noted (email discussion [AT121bis-e][421])

[R2-2304459](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304459_(Reply%20LS%20to%20SA2%20on%20PRU%20procedures).docx) Response LS on PRU Procedures RAN2 LS out Rel-18 NR\_pos\_enh2 To:SA2

* Approved (email discussion [AT121bis-e][421])

Rapporteur working documents

[R2-2302502](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302502%20Work%20Plan%20on%20Rel-18%20Positioning%20Work%20Item.docx) Work Plan on Rel-18 Positioning Work Item CATT, Intel, Ericsson Work Plan Rel-18 NR\_pos\_enh2

* Noted

Discussion:

Lenovo note that the work plan suggests stage 2 CRs from this meeting, which may be a little premature. Intel think it depends on the progress in this meeting; there are stage 2 inputs on integrity, for example. CATT also see that there are stage 2 TPs available at this meeting, so they think we can start running CRs from here.

[R2-2302738](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302738_SLPP%20specification.docx) Further considerations on SLPP specification Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2302739](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302739%20TS%2038.355%20skeleton.docx) TS 38.355 skeleton Intel Corporation draft TS Rel-18 38.355 0.0.1 NR\_pos\_enh2

* Revised in R2-2304306 (email discussion [AT121bis-e][422])
* [AT121bis-e][422][POS] SLPP specification baseline (Intel)

Scope: Collect comments on R2-2302738 and R2-2302739 and attempt to converge to a baseline, taking into account also related contributions on SLPP structure.

Intended outcome: Report in R2-2304296 and endorseable skeleton in R2-2304306

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304296](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304296%20report%20of%20%5b422%5d.docx) [AT121bis-e][422][POS] SLPP specification baseline (Intel) Intel Corporation discussion Rel-18 NR\_pos\_enh2

* Noted

Proposal 1: RAN2 endorses TS skeleton v 0.0.2 in R2-2304306, the revision of R2-2302739 as baseline for further discussion.

Proposal 2: RAN2 will discuss delta signalling, Need code, full configuration, import IE from LPP, setup/release when the parameters details are clear;

Proposal 3: RAN2 to further discuss following issues:

- FFS the need of reliable transport

- FFS SLPP message header, e.g. cast type, session ID, UE ID, transaction ID, etc. P14, P28 from R2-2303591

- FFS each message body IE is a SEQUENCE of individual IEs, applicable to all or individual positioning methods. P28 from R2-2303591

- FFS The SLPP ASN.1 design should allow for "selective ASN.1 compilation". 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.). P30 from R2-2303591

[R2-2304306](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Docs\R2-2304306.zip) TS 38.355 skeleton Intel Corporation draft TS Rel-18 38.355 0.0.2 NR\_pos\_enh2

* Endorsed as a baseline for future discussion

### 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.

[R2-2302740](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302740.docx) Further considerations on sidelink positioning Intel Corporation discussion Rel-18 NR\_pos\_enh2

[SLPP stack]

Proposal 1: RAN2 is proposed to agree that as per SA2 LS, SLPP is carried over the V2X/ProSe layer.

Discussion:

CATT think this is up to SA2, and we already agreed that it is over PC5-U. If we need something we should ask SA2.

vivo agree with CATT and wonder if SLPP should be on top of SDAP directly.

Intel and Qualcomm understand that SA2 already agreed this and the proposal is just to align.

Xiaomi have a different understanding; they think SA2 only meant that some information may need treatment over V2X/ProSe layer, and SLPP should be directly over IP/non-IP. Ericsson have the same understanding.

Huawei think SA2 already agreed this and captured it in a TS; they have the same view as Intel. They also want to understand the RAN2 impacts. They think no LS is needed and companies can confirm internally.

[Sessionless]

Proposal 2: Postpone the discussion on support of the sessionless operation until the handling of broadcast/groupcast (and the associated security aspects) are clear.

[Discovery]

Proposal 3: At least the following information shall be included as part of the discovery messages (send LS to SA2 for confirmation):

a) SL positioning capabilities, including supported positioning methods by the anchor UE

b) Ability to compute location information based on SL-PRS measurements

c) Ability to perform absolute vs relative positioning/ranging calculation

Discussion:

Xiaomi think the ability to compute can be inferred from the UE role, so at least b and c may not be necessary.

ZTE think an LS is needed if we are going to put things in the discovery signalling; they would like to clarify for SA2 that we have anchor UE attributes as one part, and anchor UE current status as another part, in the discovery messages.

Qualcomm think the discovery only needs to indicate support of SLPP, and the rest can happen in an SLPP session. They think we should not embed specific methods in the discovery signalling as we may have different methods in the future. They understand that the UE roles could be negotiated in SLPP.

vivo understand we already agreed to groupcast/broadcast of certain messages, so they wonder if the proposal means we would introduce a container in discovery signalling; the alternative could be duplicated information between discovery and SLPP.

Intel indicate that the goal is to have a discovery procedure before positioning session setup, e.g., to allow the target to learn if there are anchor UEs in the vicinity. They understand that the UE role is not directly related to, e.g., the ability to perform absolute or relative positioning.

Huawei and Xiaomi understand that SA2 have already agreed to put the UE role in the discovery message. Huawei also agree with Qualcomm that it may only be necessary to indicate support of SLPP in discovery; in general we do not include AS parameters in the upper-layer signalling.

vivo indicate from SA2 specs that there is a list of UE roles during discovery.

CATT think we can conclude on what information is necessary in the discovery message. They see that support of SLPP is needed, and further capabilities can be exchanged within LPP. They think PLMN ID and cell ID also need to be included.

Intel understand we need to check if anchor UE selection proceeds by capability exchange in SLPP or from discovery signalling. They think if supported positioning methods are not known during discovery, the target UE may learn late that an anchor UE does not support a method.

Nokia support the proposal and think there are quite a few useful parameters for anchor selection that could be in discovery; they are not necessarily all static but could also include dynamic conditions such as interconnection with other UEs, knowledge of current location, sync quality, etc. They think we could have a discussion on what parameters are supported at what stage.

Xiaomi indicate SLPP support is already covered in SA2 agreements.

OPPO understand that according to SA2 agreements, the UE role and SLPP support are intended for selection of a server UE and could result in triggering of an SLPP session; they think it is better to select anchor UEs as part of the following positioning session.

* [AT121bis-e][423][POS] Sidelink positioning parameters in discovery signalling (Nokia)

Scope: Discuss the necessary parameters in discovery signalling for identifying the involved UEs in a sidelink positioning operation and establishing a session.

Intended outcome: Report to Monday week 2 session in R2-2304297

Deadline: Friday 2023-04-21 1000 UTC

[Anchor (re)selection]

Proposal 4: For initial anchor UE selection after discovery, RAN2 is proposed to discuss and downselect between the following options:

• The LMF/server UE based approach, where LMF/server UE may obtain information about candidate anchor UEs (either from target UE itself or from (pre-)configuration) to make the selection.

• The LMF/server UE assisted approach, whereby LMF/server UE may provide selection criteria to the target UE and target UE makes the final selection.

Proposal 5: The evaluation for anchor UE selection/reselection is performed at the AS layer, which indicates the selected anchor UE to the upper layer.

Proposal 6: RAN2 supports the procedure to allows the UE to report the need for anchor UE reselection to the LMF.

Proposal 7: For anchor UE reselection during an ongoing SL positioning procedure, at least SL link quality based trigger shall be considered.

[SLPP and LPP]

Proposal 8: For the case of hybrid PC5+Uu positioning in coverage, RAN2 is proposed to agree with Option 2: SLPP signaling is transported within LPP transparently, i.e. use the newly defined SLPP to support sidelink based positioning and use the existing LPP to support Uu based positioning; and the SLPP is carried as a container in LPP

Proposal 9: For the case of PC5-only positioning in coverage, RAN2 is proposed to agree that SLPP signaling can be transported within LPP transparently, i.e. use the newly defined SLPP to support sidelink based positioning; and the SLPP is carried as a container in LPP

Discussion:

Qualcomm do not see the difference between PC5-only and PC5+Uu; in both cases it would require a sidelink-positioning-only UE to support LPP as well as SLPP. They would prefer to transport SLPP to the LMF. They also think that this could restrict what SLPP messages can be meaningfully transported; e.g., if we have session management messages, there would be no natural way to transport those within LPP.

Huawei think we only need to discuss what will be the transport method between the UE and LMF; they agree with Qualcomm that we do not need to distinguish between PC5-only and PC5+Uu. They think we can try to exclude extending LPP if it is not possible to agree on an option right away.

CATT think if the LMF is involved, they would prefer only one interface between the UE and the LMF. They understand that from the LMF perspective, it is simpler to have a single protocol.

OPPO think a UE that supports SLPP but not LPP may not be a major use case, especially for the PC5+Uu case, so they think it is not a big issue to support both protocols.

Lenovo think for PC5-only, the LMF need not be involved even in coverage. Huawei understand this is between UE and LMF. Intel understand that this is the case where an LMF selects a sidelink positioning method for a UE, so the measurements are based on PC5.

MediaTek agree with Qualcomm.

Ericsson do not see value in excluding the option to extend LPP; they think there is a majority for the container-based solution.

CATT understand that under Qualcomm’s suggestion, the UE that interacts with the LMF would need to support both SLPP and LPP. Chair understands that a UE supporting only sidelink positioning would not need to support LPP.

Qualcomm think the LMF would need to understand SLPP in either case, even if it comes in a container.

Nokia wonder if the LMF is always used in IC/PC cases in the first place. When the target is OOC, they do not see how it will speak LPP with the LMF (including any SLPP payload). They think we should decide first when the LMF is used.

Ericsson think the WID does not explicitly speak to low-power or low-capability UEs where the protocol footprint is a big problem. They think the LMF will always be involved for IC/PC.

[Architecture]

Proposal 10: In order to support sidelink based positioning for in coverage and out of coverage case, RAN2 to confirm the SL positioning architecture (including the concept of an anchor node/UE) shown in figure 1.

[UE roles]

Proposal 11: To support sidelink based positioning, RAN2 to confirm the corresponding functionality of the anchor node, i.e. (interact with the target UE over PC5 to deliver assistance data, perform SL-PRS transmission/measurement and location estimation).

Proposal 12: RAN2 confirms that either the target UE or the anchor UE may handle the functionality of the SL positioning server UE

[LCS]

Proposal 13: A SLPP session is associated with a specific location service request (i.e. MT-LR or MO-LR) as in LPP.

Proposal 14: Both MO-LR based and MT-LR based sidelink positioning procedures shall be supported for the in coverage case, using Uu based positioning design as baseline.

[Session management]

Proposal 15: Either the LMF or the SL positioning server UE is responsible for managing the positioning session for the partial coverage scenario (when target UE is not directly in NW coverage).

[Signalling flow]

Proposal 16: As per the agreed series of steps for SL positioning procedure, RAN2 confirms the signaling flow for UE based sidelink positioning for in coverage and out of coverage as captured in Figures 2 and 3 above.

[Group positioning]

Proposal 17: Based on SA2 conclusions, it is confirmed that group management for group positioning is handled by the upper/application layer and no impact is foreseen in RAN2.

Proposal 18: The group ID and/or L2 Destination IDs for transmission of capability information, assistance information and location request/response shall be provided by the upper layers.

Proposal 19: RAN2 to confirm the procedure and signaling flow for sidelink based group positioning as captured in Figures 4 above as baseline.

* [AT121bis-e][424][POS] Group positioning and multiple targets (Xiaomi/Qualcomm)

Scope: Discuss P17-P19 of R2-2302740, attempt to conclude, and evaluate whether we can reply to the SA2 LS on multiple target UEs.

Intended outcome: Report in R2-2304298 (Xiaomi) and agreeable reply LS (Qualcomm)

Deadline: Friday 2023-04-21 1000 UTC

[R2-2304298](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304298%20Report%20of%20%5bAT121bis-e%5d%5b424%5d%5bPOS%5d%20Group%20positioning%20and%20multiple%20targets%20(Xiaomi-Qualcomm).docx) Report of [AT121bis-e][424][POS] Group positioning and multiple targets (Xiaomi/Qualcomm) Xiaomi discussion Rel-18 NR\_pos\_enh2

Proposal 1 Group positioning is to acquire location estimates of multiple target UEs (absolute positioning) or multiple UE pairs (Ranging/relative positioning) per location request.

Proposal 2 (15/18) At least part of the group management for group positioning is performed at upper/application layer. FFS on whether part of the group management is done at SLPP layer.

Proposal 3 (13/18) If group management for group positioning is performed at upper/application layer, group ID is coming from upper/application layer. L2 Destination ID is coming from ProSe/V2X layer.

Proposal 4 (10/18) From RAN2 point of view, it is technically feasible to support multiple target UEs in one SLPP session, but RAN2 requires further discussion to decide whether to support multiple target UEs case.

Proposal 5 (10/18) RAN2 thinks it is technically feasible to signal the positioning results of multiple Target UEs in the same SLPP message, but if there is any security/privacy issue, it should be evaluated by SA3. Besides, RAN2 may deprioritise this scenario.

Discussion:

vivo think P1 refers to a single LCS request, not a single LPP session. Lenovo agree.

Nokia think P4 and P1 are somewhat contradictory.

CATT think P1 is in SA2 scope and we need to get a clear definition of group positioning from them.

OPPO think it is too early for P4.

Xiaomi would be OK to ask for clarification from SA2, but they think we could establish a basic understanding in RAN2.

Intel think waiting for a reply from SA2 until August is not reasonable, and we can take a WA and continue our work.

Agreements:

LS on group positioning is postponed for a reply from next meeting.

WA: RAN2 understand that group positioning is to acquire location estimates of multiple target UEs (absolute positioning) or multiple UE pairs (Ranging/relative positioning) per LCS request, in line with the guidance already received from SA2.

WA: At least part of the group management for group positioning is performed at upper/application layer.

* [AT121bis-e][428][POS] Sidelink positioning stage 2 (CATT)

Scope:

* Discuss the proposals for an architecture figure at stage 2 level and attempt to converge.
* Discuss the proposals for SLPP signalling procedures between UEs and attempt to reach agreement on a basic set of procedures.

Intended outcome: Report to CB session in R2-2304301

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304301](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304301%20Report%20of%20%5bAT121bis-e%5d%5b428%5d%5bPOS%5d%20Sidelink%20positioning%20stage%202%20(CATT).docx) [AT121bis-e][428][POS] Sidelink positioning stage 2 (CATT) CATT discussion Rel-18 NR\_pos\_enh2

[Chair’s note: Report includes only the proposals flagged as “Potentially to be agreed for online discussion”]

Architecture figure at stage 2 level:

Proposal 1-1: RAN2 to agree the UE Sidelink Positioning Architecture is based on the Figure 5.1-1: UE Positioning Overall Architecture applicable to NG-RAN in TS 38.305,

- UE A connects with NG-RAN via both LTE-Uu and NR-Uu following the legacy Architecture,

Proposal 1-2: RAN2 to agree there are two UEs which connect with NG-RAN for in coverage scenario:

- one UE (UE B) only connects with NG-RAN via NR which can be FFS.

- one UE (UE A) as in Proposal 1-1.

- there is NR-PC5 connection between the two UEs

Proposal 1-3: RAN2 to agree there are two UEs (UE C and UE D in the figure) which don't connect with NG-RAN and there is NR-PC5 connection between the two UEs for out of coverage scenario.

Proposal 1-4: [10/13] RAN2 to agree Sidelink Positioning Architecture in Figure 1-4 as baseline in TS 38.305 for further discussion.

[Chair’s note: See document for the figure]

Discussion:

Intel wonder why we need the FFS on LTE-Uu; they understand it is out of scope.

Apple also think LTE-Uu is out of scope; the WID mentions NR only.

Huawei think we will not support using LTE Uu to schedule NR PC5, but LTE Uu can still be used to carry LPP/SLPP between LMF and UE.

CATT indicate that LTE-Uu is inherited from the existing figure, and some companies think UE B does not need the LTE connection. Majority view was that only NR is needed.

Intel note that there is no LTE specification impacted in the WID, but if we can support operation with LTE-Uu without LTE spec change, it would be OK.

Agreements:

Sidelink Positioning Architecture in Figure 1-4 on R2-2304301 is taken as baseline in TS 38.305 for further discussion.

RAN2 understanding is that there is no impact to LTE specs from this objective.

SLPP signalling procedures

Involved UE roles aspect:

Proposal 2-1: RAN2 to agree to include anchor UE and Target UE in the general sidelink positioning procedures, when server UE is either Target UE or anchor UE.

Proposal 2-2: RAN2 to further discuss if Server UE acts as an entity separately in the general sidelink positioning procedures.

Proposal 2-3: RAN2 to further discuss whether UE roles are distinguished or not in the SLPP signaling procedures, e.g. UE A/B/C/D instead of UE roles.

Discussion:

CATT understand that we need P2-1 to determine which UE roles to include in the figures, and P2-2 is in line with SA2 agreements.

Qualcomm wonder what is meant by “general sidelink positioning procedures”—e.g., does it include ranging? They find the wording of P2-1 unclear regarding the UE roles, and they note that one UE can have multiple roles.

CATT indicate that some companies wanted to exclude the server UE from being shown in the procedures.

Ericsson consider that we do not need to capture everything from SA2; they think we could take P2-1 as a baseline.

vivo think a separate server UE might require extra procedures.

Nokia would like to represent all the logical functions, which may in some cases be in the same UE, resulting in signalling simplifications.

Xiaomi wonder if we can first decide if we are supporting a separate server UE to align with SA2. Ericsson think we should not copy everything from SA2 and want more time to check.

Agreement:

Anchor UE and target UE roles can be shown in the sidelink positioning procedures in stage 2. Server UE can be further discussed at least for the case that the server UE is separate from the target and anchor.

Discovery procedure aspect:

Proposal 4-1: [13/13] Discovery procedure is included in the sidelink positioning procedure for out of coverage scenario.

Proposal 4-2: [10/13] There is no distinction of UE roles in the discovery procedure for out of coverage scenario since UE roles are included in discovery message.

Proposal 4-3: [7/13] The additional signaling related to request and response for discovery should be up to SA2. Send an LS on this agreement to SA2 for confirmation.

Agreement:

Discovery procedure is included in the sidelink positioning procedure at least for out of coverage scenario.

Involved UEs in capability and assistant data exchange procedures:

Proposal 3-1: It is supported that the sidelink positioning capability and assistant data can be exchanged between target UE and anchor UEs via groupcast or broadcast.

Proposal 3-2: It is supported that the sidelink positioning capability and assistant data can be exchanged between target UE and anchor UEs via unicast if server UE is target UE or anchor UE.

Anchor UEs selection aspect:

Proposal 6-1: [11/13] Include anchor UE selection in the general in the sidelink positioning procedures for out of coverage scenario.

Proposal 6-2: [12/13] Anchor UE selection is after both discovery and capability procedures of anchor UEs.

Discussion:

Xiaomi wonder if we should consider server UE selection too. CATT indicate this was not discussed.

Agreement:

Anchor UE selection can be included in the sidelink positioning procedures at least for out of coverage scenario.

SL connection establishment aspect:

Proposal 5: [8/13] Include unicast SL connection establishment procedure before sidelink positioning capability exchange via unicast in the sidelink positioning procedures for out of coverage scenario.

Positioning methods selection aspect:

Proposal 7-1: [9/13] Positioning methods selection is not captured in the general sidelink positioning procedures.

[R2-2304297](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202304 - RAN2_121bis-e, Online\\Extracts\\R2-2304297.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202304 - RAN2_121bis-e, Online\Extracts\R2-2304297.docx) [AT121bis-e][423][POS] Sidelink positioning parameters in discovery signalling (Nokia) Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2

Proposal 1: RAN2 confirms that discovery messages will be used to carry information for targeted discovery and selection of SL positioning UEs, including at least the indication of SA2-defined UE roles such as target UE, server UE, and located UE.

Proposal 2: RAN2 to agree that the UE role information is indicated first in the discovery SLPP metafield, and any other fields (if any) indicate parameter(s) essential to the indicated UE role.

Discussion:

Nokia indicate that P1/P2 are aligned with SA2 conclusions.

vivo indicate that we do not have the “located UE” term. Lenovo have the same understanding.

Ericsson think PRUs are important. CEWiT agree.

Intel wonder if we need to update SA2 on terminology alignment.

Fraunhofer want to clarify the meaning of “selection”, i.e., whether it implies further procedures between the UEs.

vivo prefer to leave P2 open because of implications about the metadata structure.

ZTE wonder if P2 mean that all discovery modes would indicate the UE role.

Nokia intended to address concerns of the length of the fields and the linkage between the needed signalling and the functions of a particular UE role.

Lenovo wonder which group defines the metafield. They see the discovery message as provided by the application layer. Nokia understand that SA2 have left it up to RAN2 to define the payload; vivo and CATT confirm this understanding.

Agreements:

RAN2 confirms that discovery messages will be used to carry information for targeted discovery and candidate selection of SL positioning UEs, including at least the indication of anchor UE, target UE. and server UE roles. FFS how much information is indicated about anchor UEs (e.g., knowledge of location).

The UE role information is indicated in the discovery SLPP metafield. FFS if this applies to both discovery modes and which messages.

Proposal 3: RAN2 to agree that the discovery SLPP metafield contains mandatory fields for pre-defined content and optional fields for variable content (if any). FFS details such as max. length limits.

Proposal 4: Server UE indicates at least supported method(s). FFS mandatory and optional parameters associated with UE roles, including at least anchor and server UEs.

Section 2.1 on cast types

[R2-2304033](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304033%20Discussion%20on%20SL%20positioning%20-V1.doc) Discussion on SL positioning Xiaomi discussion Rel-18

Proposal 1 RAN2 to provide more detailed scenarios and basic flows regarding broadcast/groupcast to SA3.

Proposal 2 RAN2 agrees to provide above scenario and operation flow regarding broadcast to SA3 as example.

Proposal 3 RAN2 agrees to support groupcast only for group positioning.

Proposal 4 RAN2 agrees to support group positioning only for ranging.

Proposal 5 RAN2 agrees not to introduce group management procedure in SLPP layer.

Proposal 6 RAN2 agrees not to support groupcast for non-group positioning scenario.

Proposal 7 RAN2 provide with SA3 the above groupcast scenario and operation flow as example.

Session-based and sessionless aspects

[R2-2304005](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304005%20(7.2.2)%20sidelink%20positioning%20procedure%20session%20aspects_r1.doc) Designing SLPP protocol in the session perspective Samsung R&D Institute UK discussion

Proposal 1-1. For session-based SLPP, RAN2 agree that an SLPP session is used between or among UEs in order to obtain location related measurements or a location estimate or to transfer assistance data.

Proposal 1-2. For session-based SLPP, RAN2 agree that a single SLPP session is used to support a single location request for sidelink positioning.

Proposal 1-3. RAN2 agree to send LS to SA2 to inform the agreed session-based SLPP definitions and ask for the procedure on how a single SLPP session is invoked by the LCS service request for sidelink positioning.

Proposal 1-4. For session-based SLPP, RAN2 agree that SLPP can be triggered by upper layer, and SLPP can initiate the session start.

Proposal 1-5. For session-based SLPP, RAN2 agree that the following TP:

Multiple SLPP sessions can be used between/among the same endpoints to support multiple different location requests. Each SLPP session comprises one or more SLPP transactions, with each SLPP transaction performing a single operation (capability exchange, assistance data transfer, or location information transfer). In NG-RAN, the SLPP transactions are realized as SLPP procedures. The instigator of an SLPP session will always instigate the first SLPP transaction, but subsequent transactions may be instigated by other end. SLPP transactions within a session may occur serially or in parallel.

[Chair’s note: Above is the proposed text; see input document for the revision marks against the description of LPP sessions.]

Proposal 1-6. For session-based SLPP, RAN2 agree that SLPP transactions are indicated at the SLPP protocol level with a transaction ID in order to associate messages with one another (e.g., request and response).

Proposal 1-7. For session-based SLPP, it is FFS that Messages within a transaction are linked by a common transaction identifier.

Proposal 1-8. For the session based SLPP, there should be session ID to distinguish the sessions in the involved UEs.

Proposal 2-1. RAN2 agree that there is no need to restrict the used cast type for session-less SLPP.

Proposal 2-2. RAN2 agree that session-less operation can work with security.

Proposal 3. RAN2 agree that both the session-less and session-based SLPP operation are necessary to be described in the SLPP protocol specification.

* [AT121bis-e][429][POS] Session-based SLPP (Samsung)

Scope: Discuss the proposals from section 2.1 of R2-2304005 and progress towards agreements.

Intended outcome: Report to CB session in R2-2304302

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304302](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304302%20%5bAT121bis-e%5d%5b429%5d%5bPOS%5d%20Session-based%20SLPP%20(Samsung)%20v17_Rapp_v2.docx) Report of [AT121bis-e][429][POS] Session-based SLPP (Samsung) Samsung discussion Rel-18 NR\_pos\_enh2

[Easy agreement]

Proposal 1.(easy agreement) R2 agree that for session-based SLPP, a SLPP session is used among UEs in PC5-only case in order to obtain location related measurements/location estimates, to transfer assistance data, or to exchange of capabilities.

Proposal 2.(easy agreement) RAN2 agree that for session-based SLPP, a single SLPP session is created to support a single location request.

Proposal 3.(easy agreement) RAN2 agree that LS can be sent to SA2 about further resolved session-related aspects after stably agreed.

Proposal 5.(easy agreement). TP in R2-2304005 is postponed.

Proposal 6.(easy agreement). RAN2 agree that, for session-based SLPP, SLPP transactions are indicated at the SLPP protocol level with a transaction ID in order to associate messages with one another (e.g., request and response)”

Proposal 7.(easy agreement) RAN2 agree that for session-based SLPP, messages within a transaction are linked by a common transaction identifier.

Agreements:

R2 agree that for session-based SLPP, a SLPP session is used among UEs in PC5-only case in order to obtain location related measurements/location estimates, to transfer assistance data, or to exchange of capabilities.

RAN2 agree that for session-based SLPP, a single SLPP session is created to support a single location request at least in case of a single target UE; FFS how sessions work if there are multiple target UEs in a single location request.

TP in R2-2304005 is postponed.

RAN2 agree that, for session-based SLPP, SLPP transactions are indicated at the SLPP protocol level with a transaction ID in order to associate messages with one another (e.g., request and response)”

RAN2 agree that for session-based SLPP, messages within a transaction are linked by a common transaction identifier.

[Further discussion]

Proposal 1bis.(further discussion) FFS: P1 can be applied for managing the session itself (creation, termination, modification).

Proposal 2bis.(further discussion) FFS: if and how additional / subsequent requests (e.g., of same QoS) can be mapped to an existing session.

Proposal 3bis.(further discussion) FFS on the following items:

- Who can initiate the SLPP session at least for OOC (among server UE/target UE/anchor UE)

- Whether LMF can initiate the SLPP session by its own determination for i.e., more calibration after Uu-based positioning

- Who decide to use either the session-based or session-less SLPP (server UE/LMF vs target UE)

- The definition of session-based SLPP and session-less SLPP

Proposal 4.(further discussion) RAN2 further discuss, for the session-based SLPP, on the following aspects:

- Whether only server UE can start/setup the SLPP session with the involved UEs

- Whether only after service request indicated by the upper layer and all participant UEs are determined, SLPP can initiate the session start

Proposal 8.(further discussion) RAN2 further discuss on whether session ID is necessary for session-based SLPP

[R2-2302503](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302503%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning CATT discussion Rel-18 NR\_pos\_enh2

[R2-2302582](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302582%20Discussion%20on%20sidelink%20positioning.docx) Discussion on Sidelink Positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2302588](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302588_Sidelink_Fraunhofer.docx) UE Positioning using Sidelink Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2302655](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302655.docx) Discussion of signalling procedures Nokia Germany discussion Rel-18

[R2-2302656](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302656.docx) Discussion of session-based and session-less SL positioning Nokia Germany discussion Rel-18

[R2-2302885](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302885%20Discussion%20on%20further%20SLPP%20aspects.doc) Discussion on further SLPP aspects Lenovo discussion Rel-18 NR\_pos\_enh2

[R2-2302958](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302958%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2302982](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302982%20Discussion%20on%20Anchor%20UE%20(Re)discovery%20and%20(Re)selection%20for%20SL%20positioning.docx) Discussion on Anchor UE (Re)discovery and (Re)selection for SL positioning KT Corp. discussion Rel-18 NR\_pos\_enh2

[R2-2303048](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303048_Discussion%20on%20SL%20positioning%20discovery%20and%20selection%20procedure.doc) Discussion on SL positioning discovery and selection procedure Samsung discussion Rel-18 NR\_pos\_enh2

[R2-2303078](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303078_SL_Pos_Res.docx) Considerations on sidelink positioning resources Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303131](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303131%20Discussion%20on%20Sidelink%20Positioning.docx) Discussion on Sidelink Positioning LG Electronics Inc. discussion Rel-18

[R2-2303186](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303186%20Further%20discussion%20on%20sidelink%20positioning.docx) Further discussion on sidelink positioning OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2303187](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303187%20Further%20discussion%20on%20%20anchor%20UE%20reslection%20for%20sidelink%20positioning.doc) Further discussion on anchor UE reselection for sidelink positioning OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2303298](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303298_SLPosArch.docx) On SL Positioning Architecture Aspects Lenovo discussion Rel-18

[R2-2303365](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303365-pos-broadcast-v0%202.docx) SL positioning groupcast and broadcast Apple discussion Rel-18 NR\_pos\_enh2

[R2-2303366](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303366-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

[R2-2303443](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303443-View%20on%20SL%20positioning%20procedure%20and%20signalling%20protocols%20for%20SL%20positioning.docx) View on SL ranging and positioning architecture and signalling procedures CEWiT discussion

[R2-2303497](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303497%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2303538](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303538%20Considerations%20on%20Sidelink%20positioning.doc) Considerations on Sidelink positioning CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2303569](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303569%20Discussion%20on%20potential%20solutions%20for%20SL%20positioning.docx) Discussion on potential solutions for SL positioning Spreadtrum Communications discussion Rel-18

[R2-2303591](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303591_(Sidelink%20Positioning).docx) Sidelink Positioning Protocol (SLPP) Signaling and Procedures Qualcomm Incorporated discussion

[R2-2303703](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303703%20Sidelink%20.docx) Sidelink positioning Ericsson discussion Rel-18

[R2-2303753](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303753_Protocol%20considerations%20for%20Anchor%20UEs%20with(out)%20known%20location.doc) Protocol considerations for Anchor UEs with(out) known location Philips International B.V. discussion R2-2301890

[R2-2303993](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303993%20(R18%20NR%20POS%20A722%20SL%20POS).docx) Discussion on Sidelink positioning InterDigital Communications discussion Rel-18

[R2-2304182](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304182%20SL%20pos%20server.doc) On the support of SL positioning server functionality Philips International B.V. discussion

### 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.

Agenda item summary

[R2-2304193](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304193%20Summary%20of%20AI%207.2.3%20on%20RAT-dependent%20integrity.docx) Summary of AI 7.2.3 on RAT-dependent integrity vivo discussion Rel-18 FS\_NR\_pos\_enh2

• General aspects

Proposal 1: Address the remaining issues to support the integrity operation for DL-AOD:

- LS to RAN1 to confirm that the beam-related information (Beam Bore-Sight Direction and Beam Antenna Information) are error sources for DL-AoD positioning.

- LS to RAN1 to ask about the error distribution of DL-PRS RSRP, RSRPP and beam-related information.

Discussion:

CATT do not support asking RAN1; they think there is no reason for RAN2 to send an LS, and RAN1 are already engaged in discussing the error sources that were captured in the TR, not including the beam-related information.

Intel note that RAN1 were not listed in the WID, and if we do not send an LS, they may not handle this topic; they did discuss beam-related information in the SI phase but did not conclude. So they see it as useful to trigger the discussion in RAN1, and they see other integrity topics such as the DNU flag where we will have questions for RAN1.

Qualcomm agree with the first bullet of P1; they understand that this issue was left for normative work in RAN1, but they have no time allocated, so we need to trigger work via an LS. For the second bullet, they think this is not needed in light of previous meeting discussions on error distributions.

Nokia agree with Qualcomm and think we should ask RAN1 for assistance where we need it; they also recall that the beam-related information was left for normative work. They also agree that the second bullet is not necessary.

vivo indicate that RAN1 left the beam-related information for normative work, and on the second bullet, they think the point is that no error information was included in the TR and they would like to confirm the overbounding distribution for these as well.

Agreement:

LS to RAN1 to include a request for confirmation that the beam-related information (Beam Bore-Sight Direction and Beam Antenna Information) are error sources for DL-AoD positioning.

Proposal 3: RAN2 to discuss whether to introduce DNU flag in measurement from UE/gNB for LMF-based integrity. If agreed from RAN2's perspective, LS to RAN1/RAN3 to confirm the feasibility and necessity.

Discussion:

Qualcomm do not quite see what a DNU for a measurement would mean; you only know after making the position calculation what the integrity judgement is, and it does not come from a single measurement.

Xiaomi do not understand why a measurement would be valid for positioning but not for integrity.

Intel have the same view as Qualcomm and Xiaomi. Apple also agree and would like to understand what would cause this situation.

OPPO agree that the DNU flag is not useful.

Ericsson think this is difficult to discuss without face-to-face time, but they agree with Qualcomm that a single measurement is not enough for an integrity result, so they see this as difficult to evaluate.

Lenovo think the DNU flag can indicate the quality of the measurements, and how to use it depends on the LMF; they support the proposal, including the LS to RAN1.

Huawei point out that we agreed to have DNU for AD, but for measurements, they think it is out of RAN2 expertise to decide; they suggest we ask RAN1 if it is needed for the integrity algorithm. Intel would be OK with this.

Nokia think RAN3 would not be able to help, but it would be OK to send an LS to RAN1; they think it is mainly a RAN2 discussion, however, since we decided to model it on GNSS integrity.

vivo point out that we included the DNU flag for AD because the equation includes it, and the same reasoning may apply to measurements.

InterDigital do not see the point of DNU for measurements.

CATT think since it is not clear here why the measurement result needs the DNU flag, we should not decide to introduce it. They understand that RAN1 are already discussing quality indicators for measurements. They can accept an LS to RAN1, but they recall that during the SI RAN1 passed this question to us.

ZTE think we could ask RAN1 for confirmation. Regarding CATT’s comments, they understand that we have quality indicators, but the DNU is different.

Apple are not sure why DNU is in RAN1 domain.

Agreement:

LS to RAN1 to include the question of whether RAN1 identify a need for a DNU flag for measurements.

Proposal 4: RAN2 to discuss whether to introduce Residual Risk and the IRallocation for RAT-dependent integrity.

Proposal 5: RAN2 to discuss whether to introduce the Integrity Correlation Times for RAT-dependent integrity.

Discussion:

Qualcomm wonder what the alternative to P4 would be, since we agreed to use the GNSS principle and it includes these values.

Apple are OK with the additional parameters.

Nokia think we need to understand in the RAT-dependent context what these parameters mean.

vivo intend that we would discuss the value range of these parameters if we have consensus to introduce them.

Lenovo are OK with both proposals.

CATT wonder, since these are AD from LMF to UE, where the values come from for RAT-dependent integrity; they are not sure how the LMF can generate these parameters.

OPPO agree with Nokia and think we need to understand the usage of the parameters.

vivo cite the integrity inequality that contains Residual Risk and IRallocation. OPPO understand that they can be captured by the TIR; vivo consider that they are separate parameters.

Huawei think this could go offline. On P5, they recall the correlation time in the AD, and they think we need more discussion between AD and measurements.

Nokia and Qualcomm think soliciting future contributions may be more productive than an at-meeting email.

Proposal 6: The PL calculation is performed by the entity which also performs the position calculation for a location process.

Discussion:

Xiaomi wonder if this has any impact on GNSS integrity, since Rel-17 only supports UE-based integrity. Chair understands no changes to GNSS integrity.

Agreement:

For RAT-dependent integrity, the PL calculation is performed by the entity which also performs the position calculation for a location process.

• Signaling procedure of UE-based integrity

Proposal 10a: For UE-based integrity, support mechanisms for UE to request and for LMF to provide integrity parameters of TRP-related error sources per location method in assistance data.

Discussion:

Apple want to clarify that this does not exclude posSIBs.

Qualcomm think P10b would clarify the posSIB issue; it is clear that these parameters would go in the AD elements.

Nokia want to understand the meaning of “integrity parameters” in more detail. vivo indicate this is in P10b.

Huawei think we should inherit the existing features and this proposal does not exclude those; the point may be that the organisation is per positioning method rather than per error source.

Intel understand that the main point is that we reuse LPP Request Assistance Data to retrieve this information; we do not have a mechanism today to request the posSIB from the LMF.

Qualcomm think the parameters are not different per positioning method. They note that the PRS assistance data are not provided per-method.

Nokia understand that the parameters would then need to be in a common IE. Huawei think some error sources, like TRP location, are common to all UE-based methods, while others, like timing or angular error, are method-specific.

Agreements:

For UE-based integrity, the integrity parameters of error sources for RAT-dependent integrity are included in assistance data.

LPP Request/Provide Assistance Data are reused for retrieving the integrity parameters to the UE from the LMF. The request is per positioning method (as in legacy operation) and the provided integrity parameters are as appropriate for the selected positioning method.

Use of posSIBs for integrity parameters is not excluded.

Proposal 10b: The bound parameters of TRP-related error sources are provided per TRP in each error source for the concerned positioning method. To be specific:

- TRP location error can be provided for DL-TDOA and DL-AoD in TRP-LocationInfoElement.

- Inter-TRP synchronization error can be provided for DL-TDOA in ReferenceTRP-RTD-Info and RTD-InfoElement.

Proposal 2: RAN2 to discuss the granularity of DNU flags in TRP-related assistance data (e.g., TRP location and Inter-TRP synchronization). The following two options can be considered:

- Option 1: The DNU flags are provided per error source

- Option 2: The DNU flags are provided per TRP in each error source

Proposal 11: For UE-based integrity, reuse the TargetIntegrityRisk in commonIEsRequestLocationInformation to request RAT-dependent integrity results.

Proposal 12: For UE-based integrity, RAN2 to discuss whether to support Mode 2 of Integrity Result Reporting, i.e., UE compares the calculated PL with the given AL and indicates whether the positioning system is available or not.

• Signaling procedure of LMF-based integrity

Proposal 15: For LMF-based integrity, no integrity KPI and integrity results transfer in LPP message.

Discussion:

Ericsson think there is one use case where the QoS parameters are provided to the UE in LPP, and we may have a similar situation for the integrity parameters. So they would prefer that we take this as a WA. CATT understand that this only applies for UE-based.

Working assumption:

For LMF-based integrity, no integrity KPI (TTA, TIR, and AL) and integrity results transfer in LPP message.

Proposal 16a: RAN2 to discuss how to handle error sources from UE/gNB measurement information for LMF-based integrity. The following two options can be considered:

- Option 1: UE/gNB to report integrity parameters together with measurement information to LMF directly. (11/13)

- Option 2: It is left to LMF implementation to decide the measurement error source bound distribution based on the measurement results from UE and/or NG-RAN. (2/13)

Note: Option 2 is not aligned with the procedure in the SI phase and has an impact on RAN3. If Option 2 is preferred from RAN2’s perspective, LS to RAN3 to confirm.

Discussion:

Intel think we discussed last meeting whether the gNB should provide the error message to the LMF, and we felt that the gNB could not know the error; so they want to understand how option 1 works. Huawei understand this agreement was only for AD.

Qualcomm agree with Huawei that the measurement errors are different from the AD errors, but they consider that it can be left to LMF implementation. They feel that we should not take a majority decision without some more thought.

Huawei and Qualcomm think that option 2 would mean no impact to the specs. Qualcomm think this is actually in line with what we have for UE-assisted integrity for GNSS; nothing stops the LMF from computing an integrity estimate.

CATT agree with Qualcomm that the LMF can calculate the integrity parameters by itself.

Apple also prefer option 2; they find it strange that the same entity that provides the measurements would also provide the error bounds. They do not see the lack of standards impact as an issue.

Huawei and OPPO are also OK with option 2.

Ericsson think RAN1 already agreed that the UE will report the error.

Huawei agree that this RAN1 agreement is an issue, and they think it may be hard to agree on an option now.

Working assumption:

It is left to LMF implementation to decide the measurement error source bound distribution based on the measurement results from UE and/or NG-RAN.

Agreement:

Indicate the WA above in the LS to RAN1 to allow them to register any concern.

Proposal 16b: If Option 1 of P16a is agreed, RAN2 to discuss how to capture the error bounds of UE measurement for the concerned location method (RSTD measurement error for DL-TDOA, UE Rx-Tx time difference error for Multi-RTT and DL-PRS RSRPP error of the first path or RSRP). The following two options can be considered:

- Option 1: the error bounds of UE measurement are provided per measurement element

- Option 2: the error bounds of UE measurement are provided per measurement information of each error source

• Text proposal

Proposal 18: RAN2 to discuss which chapter (5.3, 7, or 8) to capture the stage 2 impact in TS 38.305 for RAT-dependent integrity. Take the TP from R2-2302504 and R2-2303682 as the baseline.

Discussion:

Qualcomm think we have divergent views of a lot of aspects and we should sort out the content before we start on TPs for stage 2.

CATT think we need to start the running CR.

vivo think section 7 would make sense, as this is where we captured new features in Rel-17. They could accept chapter 8 but think it might lead to duplication. ZTE also agree with section 7.

Huawei think this applies to other features as well.

Agreement:

Capture the stage 2 impact for RAT-dependent integrity in section 7 of 38.305. Initial running CR to be seen at next meeting, using R2-2302504 and R2-2303682 as baseline.

* [AT121bis-e][433][POS] LS to RAN1 on RAT-dependent integrity (OPPO)

Scope: Inform RAN1 of RAN2 decisions on RAT-dependent integrity and solicit their input as indicated in the agreements.

Intended outcome: Approved LS (without CB if possible) in R2-2304460

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304460](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304460%20draft%20LS%20to%20RAN1%20on%20RAT-dependent%20positioning%20integrity.docx) Draft LS to RAN1 on RAT-dependent positioning integrity OPPO LS out Rel-18 NR\_pos\_enh2 To:RAN1 Cc:RAN3

* Approved as R2-2304563 with the following changes:
* Q2: omit the condition on the WA
* Q2: omit the sentence on the use case

Discussion:

OPPO indicate that we need to understand the applicability of the integrity operation to DL-AoD, and the question on the DNU flags.

Nokia think for the DNU flag sentence we can capture exactly what is agreed and it does not need to be conditioned on the WA.

Huawei think the intention of the condition on the DNU flag is to make the LS consistent: If the WA holds, we do not need to discuss the DNU flag issue. They also think we do not need to ask about the use case, since we know it is for LMF-based integrity.

InterDigital agree with Nokia and think we should just copy and paste the agreement. They also agree with Huawei that if the WA is confirmed we do not need to discuss it, but we can leave this for RAN1 to take into account. On Q1 (applicability to DL-AoD), they think we do not need to put the “if the answer is no” condition, which was not discussed online yet.

vivo understand that if we do not ask Q1 now, we may need to send another LS later.

Intel think the question came up in discussion, and if RAN1 say they will not specify anything for the beam-related information, we will still need to discuss the applicability of integrity. On DNU, they agree with Huawei that the confirmation of the WA is needed for the question to make sense.

Xiaomi think on the DNU flag, we agreed to ask if it is needed, and then we took the WA; they agree with Huawei that if the WA holds we do not need to discuss it.

Apple are OK to remove the conditioning text in Q2, but they would like to keep the question about the use case.

Huawei think the condition in Q2 could be left out, but the question is whether we ask about the use case; we did not previously agree to ask this, and they think it is not necessary.

Lenovo think the additional clarification on Q1 would be useful.

Ericsson are fine to omit the additional material in Q2.

InterDigital understand that the additional material on Q1 needs not to be included since there was no discussion about it.

CATT understand that RAN1 discussed the error sources and the additional condition on Q1 is not needed.

Agreements:

Q1: no addition over the version in R2-2304460

Q2: omit the condition on the WA

Q2: omit the sentence on the use case

LS approved with these changes.

The following documents will not be individually treated

[R2-2302504](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302504%20Discussion%20on%20RAT-Dependent%20integrity.docx) Discussion on RAT-Dependent integrity CATT discussion Rel-18 NR\_pos\_enh2

[R2-2302581](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302581%20Discussion%20on%20RAT-dependent%20integrity.docx) Discussion on RAT-dependent Integrity Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2302741](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302741_Integrity.docx) Further considerations on RAT dependent integrity Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2302959](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302959%20Discussion%20on%20RAT-dependent%20positioning%20integrity.docx) Discussion on RAT-dependent positioning integrity vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303184](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Docs\R2-2303184.zip) Consideration on RAT-dependent positioning integrity OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2303230](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303230%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent integrity Lenovo discussion Rel-18

[R2-2303433](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303433%20Discussion%20on%20RAT-dependent%20positioning%20integrity.doc) Discussion on RAT-dependent positioning integrity Xiaomi discussion

[R2-2303495](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303495%20Discussion%20on%20RAT-dependent%20methods%20positioning%20integrity.docx) Discussion on RAT-dependent methods positioning integrity ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2303540](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303540.docx) Discussion on the integrity issues CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2303571](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303571%20Discussion%20on%20solutions%20for%20integrity%20of%20RAT-dependent%20positioning%20techniques.docx) Discussion on solutions for integrity of RAT-dependent positioning techniques Spreadtrum Communications discussion Rel-18

[R2-2303682](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303682_(integrity).docx) Integrity of NR Positioning Technologies Qualcomm Incorporated discussion

[R2-2303705](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303705%20Integrity.docx) RAT Dependent positioning Integrity Ericsson discussion Rel-18

[R2-2303994](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303994%20(R18%20NR%20POS%20A723%20RAT%20dependent%20integrity).docx) Discussion on RAT dependent integrity InterDigital Communications discussion Rel-18

[R2-2304058](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304058%20Integrity%20Parameters%20Spec%20Impact.docx) Spec impact of RAT-dependent error sources for positioning 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

[R2-2304197](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304197%20summary%20of%207.2.4-v3.docx) Summary of 7.2.4 LPHAP Apple discussion Rel-18 NR\_pos\_enh2

Extending eDRX cycle

Proposal 1: to discuss whether the objective of extending eDRX cycle beyond 10.24s in RRC\_INACTIVE is expected to be addressed in the eRedCap WI.

Discussion:

Huawei think we discussed this last meeting and wanted to wait for RedCap.

CATT think RedCap have now reached some agreements on candidate values, so we may be able to agree that these values can apply to LPHAP.

Ericsson agree with Huawei.

Intel think the intention is to wait for RedCap from RAN2 perspective, but RAN1 may look at it.

Agreement:

Wait for RedCap progress on extending eDRX cycle (from RAN2 perspective).

SRS configuration enhancements based on validity area for UEs in RRC\_INACTIVE

Proposal 2a: SRS validity area configuration contains list of cells in which it is valid and validity time.

Discussion:

vivo wonder what the difference is between the validity time and the TA timer. Ericsson, ZTE, and Huawei have the same question; Ericsson also think we did not have an explicit validity time for downlink.

Samsung agree with vivo and others; they think the UE can release the SRS configuration based on the TA timer.

OPPO agree that the TA timer could be reused.

CATT indicate that the validity timer is intended to ensure that the resources are valid for the UE across multiple cells, while the TA timer is per cell; once the UE is out of sync with a particular cell, the TA is invalid but the SRS may still be valid.

ZTE indicate that RAN1 agreed an area-specific TA timer for SRS positioning validity area is feasible; they think this is the same thing as the validity timer. They understand that the per-area TA timer would be the only TA timer applicable for SRS with a validity area; i.e., there is no per-cell TA timer in this case.

Huawei have the same view as ZTE. They understand that the area TA timer is different from the legacy TA timer in that it does not stop at cell reselection, and that when it expires, the configuration is not invalidated although the UE should stop transmission. Intel agree with Huawei and ZTE and think we should discuss when the UE releases the configuration.

Intel would like to avoid a timer-based implicit release.

Nokia think it is confusing to link the validity to a TA timer; if we need a timer for the configuration, it would be better to have a separate timer. They also wonder how it relates to preconfigured SRS.

Agreement:

The SRS validity area configuration contains a list of cells in which it is valid. FFS validity timer or if we would depend only on explicit release by the network.

Proposal 2b: RRCRelease is used to provide SRS (pre)configuration.

Discussion:

Qualcomm think the message should be RRCReconfiguration, i.e., preconfiguration happens when the location session is being set up.

ZTE think RRCRelease is fine because the configuration is used in RRC\_INACTIVE, and the reconfiguration message is received in RRC\_CONNECTED.

Intel have a similar view to ZTE and think using RRCReconfiguration would mean we had to talk about how to handle the TA timer and increased the complexity.

CATT agree with the proposal as it is and think we can agree that the (pre)configured SRS can be UE-specific.

vivo think “(pre)” should be removed, and the validity area should be added, otherwise the proposal does not make sense.

Qualcomm think this agreement does not add anything new, and the preconfiguration of SRS is supposed to avoid frequent reconfigurations, which can only happen if it is configured when the session is set up.

Xiaomi think if the RRCReconfiguration is used, coordination between gNBs needs to be considered for when the UE hands over.

Lenovo agree with the use of RRCRelease; for the reconfiguration, they think there should be a single solution.

Huawei think the scope of LPHAP is for positioning in RRC\_INACTIVE, and they do not see a need to use RRCReconfiguration for an inactive configuration. They note that the UE may not transmit immediately in RRC\_INACTIVE but be preconfigured with SRS that will be activated on an event.

Agreements:

RRCRelease can be used to provide SRS configuration with validity area for use in RRC\_INACTIVE.

Proposal 2c: to discuss whether SRS (pre)configuration can also be provided via posSIB.

Discussion:

CATT think the SRS can be configured by posSIB, like DL-PRS with a validity area.

Intel think if we use the posSIB with multiple configurations, there could be confusion if UEs collide by using the same configuration, so the network has to change the posSIB to remove the configurations that are in use.

Huawei think the question is how to support this feature, and they think RACH procedure can resolve the contention as discussed in RAN1.

ZTE do not support using the posSIB; they think dedicated signalling is efficient enough and posSIBs may cause more power consumption.

Huawei think posSIB was agreed as a conclusion in the SI phase, but companies can check.

Proposal 2d: to discuss whether to introduce SRS configuration update request via RRC and SRS configuration activation request via RRC.

Discussion:

Xiaomi indicate that we agreed in a previous meeting that an update request can be made, and the activation request would make sense to follow.

vivo understand that the activation part is related to preconfiguration.

Ericsson recall that last meeting we agreed that if the UE leaves the validity area, it can send an RRC message. They think we should have a single solution in the SRS validity area, and the preconfiguration and configuration request are not needed, but we could come back to this after getting a baseline.

Lenovo think we should clarify that the RRCResumeRequest message can be used for the update. For the second part, they think it is not essential.

CATT and Ericsson think the update request is confusing; when the UE leaves the validity area, its configuration is invalid.

OPPO understand the use case when the UE leaves the validity area, but they think this is more of a corner case if the validity area is large. If the UE has no valid SRS configuration, they think this is already addressed in Rel-17 with the use of SDT.

Intel understand that we included this in the WI objectives and the SI recommendations.

Huawei are OK with the current proposal but would like to leave open which RRC message is used. They are concerned about space in Msg3.

Ericsson are concerned about having multiple configurations for the UE.

Qualcomm find the discussion confusing; we have the objective of area validity and multiple cells, but also the preconfiguration objective, which is independent of validity area, and we need to have a way to activate the SRS. CMCC agree with Qualcomm.

Agreement:

SRS configuration request can be indicated via Msg3/MsgA transmission. FFS if the request is in the RRC message or an accompanying MAC CE.

Proposal 2e: to discuss whether to support multiple SRS configurations.

Proposal 2f: to discuss which node (gNB or LMF) determines SRS validity area.

DL-PRS measurements in RRC\_IDLE and reporting in RRC\_CONNECTED

Proposal 3: to discuss whether to send the LS to SA2 to confirm the existing procedures can support DL-PRS measurements in RRC\_IDLE and reporting in RRC\_CONNECTED.

Discussion:

Huawei think the current SA2 spec supports this, but they would be OK to confirm.

CATT are also fine, but they think we need to clarify that deferred MT-LR is a precondition.

Intel understand we did not agree that this is only for deferred MT-LR; they would prefer to send the open question about the states.

Nokia think it is strange to ask SA2 about the state for measurements, and we should just tell them that we plan to do this and ask them to align their specs. Intel would be OK with this.

CATT indicate that WID scopes the LPHAP objective only to use case 6, which is only for deferred MT-LR.

Ericsson understand that this is already used in LTE NB-IoT, so no LS is needed.

Alignment between eDRX and PRS configurations

Proposal 4a: to standardize a mechanism to align PRS to fixed DRX. If not greeble, standardize two mechanisms: to align PRS to fixed DRX and to align DRX to fixed PRS.

Proposal 4b: for aligning PRS to fixed DRX, discuss whether to re-use the legacy UE-initiated on-demand PRS signalling or task RAN3 to define new NRPPa signalling.

Proposal 4c: For the alignment of AMF-generated DRX configuration with fixed PRS, the existing NAS message REGISTRATION REQUEST/RESPONSE can be reused/enhanced. For the alignment of gNB-generated DRX configuration with fixed PRS:

• For UE-based approach, RRC message can be used for the UE to request the DRX configuration,

• For LMF-based approach, NRPPa message MEASUREMENT PRECONFIG can be used,

• For gNB-based approach, LPHAP indication obtained from the LMF and available PRS configuration in RAN

Proposal 4d: to discuss whether to align SRS with DRX.

SA2 LS on WI scope

Proposal 5: Send a reply LS to SA2 to indicate that from the perspective of RAN2, “low power or high accuracy” positioning is out of the Rel-18 WI scope.

Discussion:

ZTE and Ericsson agree. Huawei understand RAN1 have already replied; Intel and CATT confirm this. ZTE think we should reply since there is a RAN2 action.

Agreement:

Send a reply LS to SA2 to indicate that from the perspective of RAN2, “low power or high accuracy” positioning is out of the Rel-18 WI scope.

* [AT121bis-e][434][POS] Reply LS to SA2 on low power or high accuracy positioning (Huawei)

Scope: Draft a reply LS to SA2 indicating that “low power or high accuracy” is out of the WI scope.

Intended outcome: Approved LS (without CB if possible)

Deadline: Tuesday 2023-04-25 1800 UTC

[R2-2304461](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304461%20Reply%20LS%20to%20SA2%20on%20low%20power%20high%20accuracy%20positioning.docx) Reply LS to SA2 on Low Power High Accuracy Positioning RAN2 LS out Rel-18 NR\_pos\_enh2 To:SA2 Cc:RAN1,SA1

* Approved (email discussion [AT121bis-e][434])

The following documents will not be individually treated

[R2-2302505](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302505%20Discussion%20on%20LPHAP.DOCX) Discussion on LPHAP CATT discussion Rel-18 NR\_pos\_enh2

[R2-2302580](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302580%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2302589](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302589_LPHAP_Fraunhofer.docx) Enhancements for supporting LPHAP Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2302742](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Docs\R2-2302742.zip) Further considerations on LPHAP Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2302960](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302960%20Discussion%20on%20solution%20of%20LPHAP.docx) Discussion on solution of LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303079](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303079_LPHAP_v3.docx) Considerations on Low Power High Accuracy Positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303185](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303185%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2303231](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303231%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2303367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303367-PRS-DRX-alignment-v0.docx) Alignment between DRX and PRS Apple discussion Rel-18 NR\_pos\_enh2

[R2-2303434](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303434%20Discussion%20on%20LPHA%20positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2303494](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303494%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2303539](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303539%20Considerations on LPHAP.doc) Considerations on LPHAP CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2303570](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303570%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Spreadtrum Communications discussion Rel-18

[R2-2303697](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303697_(LPHAP).docx) Enhancements for LPHAP Qualcomm Incorporated discussion

[R2-2303704](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303704%20LPHAP.docx) Discussion on Low Power High Accuracy Positioning Ericsson discussion Rel-18

[R2-2303886](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303886_Discussion%20on%20SRS%20configuration%20in%20RRC_INACTIVE.docx) Discussion on SRS configuration in RRC\_INACTIVE Samsung discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303985](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303985%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP LG Electronics Inc. discussion Rel-18

[R2-2303995](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303995%20(R18%20NR%20POS%20A724%20LPHAP).doc) Discussion on LPHAP InterDigital Communications discussion Rel-18

[R2-2304059](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304059%20PRS%20and%20DRX%20configuration%20alignment.docx) PRS and DRX configuration alignment Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core R2-2301752

### 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.

[R2-2302818](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302818%20Discussion%20on%20RAN1%20led%20positioning%20topics.docx) Discussion on RAN1 led positioning topics Huawei, HiSilicon discussion Rel-18

Proposal 1: RAN2 wait for RAN1 progress on PRS and SRS frequency hopping before studying the enhancements required in RAN2.

Proposal 2: For either SRS or PRS configuration, LMF does not need to know the RedCap UE capability.

Proposal 3: Signaling enhancements are needed to support the new measurements introduced by CPP method. Wait for RAN1 progress to specify the measurements.

Proposal 4: Signaling enhancements are needed to support the new measurements introduced by PRS bandwidth aggregation-based measurement. Wait for RAN1 progress to specify the measurements.

Proposal 5: Signaling enhancements are needed to support the new measurements introduced by SRS bandwidth aggregation. Wait for RAN1 progress to specify the measurements.

Proposal 6: Support decoupling the positioning PRS/SRS bandwidth aggregation with communication carrier aggregation and wait for RAN1 progress to specify the signaling.

[R2-2302506](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302506%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

[R2-2302743](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302743%20RAN1%20led%20items.docx) Considerations on other RAN1 led items Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2303435](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303435%20Discussion%20on%20RedCap%20UE%20positioning.doc) Discussion on RedCap UE positioning Xiaomi discussion

[R2-2303496](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303496%20Discussion%20on%20BW%20aggregation%20and%20RedCap%20positioning.docx) Discussion on BW aggregation and RedCap poositioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2303541](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303541.docx) Discussion on the RedCap UE positioning CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2303706](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303706%20RedCap.docx) RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning Ericsson discussion Rel-18

[R2-2303887](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303887_Discussion%20on%20bandwidth%20aggregation.docx) Discussion on bandwidth aggregation Samsung discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2303996](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303996%20(R18%20NR%20POS%20A725%20Others).docx) Discussion on positioning for RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning InterDigital Communications discussion Rel-18

## 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 LS with “take into account” action

[R2-2302445](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302445_S2-2303381.docx) Reply LS on Differentiation of Layer2 ID and Coexistence of U2N/U2U (S2-2303381; contact: CATT) SA2 LS in Rel-18 5G\_ProSe\_Ph2 To:RAN2

* Noted (email discussion [AT121bis-e][400])

Incoming LS with questions (discuss under agenda item 7.9.2)

[R2-2302442](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302442_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

* Postponed

Rapporteur work documents

[R2-2302994](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302994-Contents%20for%20rel-18%2038.300%20CR%20draft.docx) Contents for rel-18 38.300 CR draft LG Electronics Inc. discussion Rel-18 38.300

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

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

Intended outcome: Report to CB session in R2-2304293 and endorseable CR baseline

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304293](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Docs\R2-2304293.zip) [AT121bis-e][418][Relay] 38.300 relay CR draft (LG) LG Electronics Inc. discussion Rel-18

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

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

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

[Chair’s note: Clause numbering corrected]

Proposal 2: The following sub-clause can be made under “16.12 Sidelink Relay” for intra/inter-gNB i2i on TS 38.300.

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

Agreements:

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

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

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

The following sub-clause can be made under “16.12 Sidelink Relay” for intra/inter-gNB i2i on TS 38.300.

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

[Chair’s note: Support numbers corrected in P3 to align with the paper body and the discussion; clause numbers corrected]

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

(Option 1) making a new clause in parallel with the legacy “16.12 Sidelink Relay” [11/19].

(Option 2) making a new sub-clause under “16.12 Sidelink Relay” [8/19].

Discussion:

vivo suggest leaving it to the rapporteur rather than discussing.

Agreement:

A new clause is added for multi-path relay in parallel with the legacy “16.12 Sidelink Relay”.

### 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

[R2-2304194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304194%20Summary%20of%20AI%207.9.2%20on%20U2U%20relay.docx) [Pre121bis-e][406][Relay] Summary of AI 7.9.2 on U2U relay (Lenovo) Lenovo discussion Rel-18

[Easy proposal]

Discovery:

Proposal 4a: After a relay UE receives a discovery message from a source remote UE, the relay UE transmits discovery response message or forwards the discovery message for DCR message with integrated Discovery case only if the PC5 RSRP between the relay UE and the source remote UE is above a threshold.

Proposal 4b: For Model-B discovery, after receiving a discovery message from a relay UE, a target remote UE transmits the discovery response message only if the PC5 RSRP between the target remote UE and the relay UE is above a configured threshold.

Proposal 4c: After receiving discovery solicitation message from source remote UE, relay UE is triggered to transmit discovery solicitation message to target remote UE only if the PC5 RSRP between the relay UE and the source remote UE is above a threshold.

Discussion:

Intel are OK with the second part of P4a for the DCR message forwarding, but for the first part on transmitting the discovery response, they think SA2 have not referred to using PC5 RSRP as a criterion for sending discovery messages. They understand the RSRP threshold limitation for model A/B discovery may only apply to the end UEs. The relay UE might do discovery but not selection if the link is poor. Ericsson have a similar concern. OPPO agree with Intel.

vivo think we should consider P4c as well, for model B.

Apple think in P4b, the target remote UE will select the relay UE before transmitting the response, so we may not need to agree this separately from selection.

ZTE also think P4c for model B is similar to the integrated discovery case. They think we can further discuss the AS criteria for discovery.

InterDigital think both 4b and 4c are necessary and function in a similar way to integrated discovery.

OPPO consider on P4b, when the target remote UE responds to the discovery message, it means the relay UE is selected, so they think it is needed to have the same condition for selection and discovery response. For P4c, they think model B is different from integrated discovery; in the latter, only the second hop is considered by the target remote UE, and in the former, both hops can be considered; so they think the relay UE does not need to evaluate the link quality in model B.

Lenovo indicate that in P4b, it is different from relay selection in case there are multiple relay UEs available. Apple understand that in this case the remote UE needs to select which relay to respond to.

NEC think P4b could exclude blind forwarding of the discovery message.

Agreements:

For the integrated-discovery case, the relay UE forwards the discovery message for DCR message with integrated Discovery case only if the PC5 RSRP between the relay UE and the source remote UE is above a threshold.

For Model-B discovery, after receiving a discovery message from a relay UE, a target remote UE transmits the discovery response message only if the PC5 RSRP between the target remote UE and the relay UE is above a configured threshold. FFS if there is separate impact for this agreement from the relay selection functionality.

Resource allocation:

Proposal 16: Both mode-1 and mode-2 resource allocation can be supported on both remote UE and relay UE in U2U relay case.

Discussion:

CMCC think this relates also to P17 on authorization.

Qualcomm want to clarify that we do not enhance the resource allocation for U2U and the gNB does not need to be aware that it is for this purpose.

Ericsson wonder if we should look at P1 at the same time.

NEC think we should think about the scenarios; the proposal may exclude coexistence between U2U and U2N. They understand that if the U2U remote UE is configured with mode 1, and it also has a U2N service (with a different L2ID), there is a conflict because the U2N remote UE cannot be configured with mode 1.

Agreement:

Both mode-1 and mode-2 resource allocation can be supported on both remote UE and relay UE in U2U relay case. No impact to legacy resource allocation procedures is expected.

SRAP design and E2E PC5 link:

Proposal 21a: End-to-end PC5 RRC connection between source remote UE and target remote UE is supported.

Discussion:

Ericsson think we already agreed to the stack.

InterDigital think it is somewhat implied by the stacks, but our agreements do not mention the connection so far. Lenovo indicate that SA2 specs show an end-to-end connection.

NEC can agree with the intention but want to clarify what is meant by the end-to-end connection: Do we support all PC5-RRC procedures, such as RLM, between the remote UEs?

Agreement:

End-to-end PC5 RRC connection between source remote UE and target remote UE is supported, in addition to PC5-RRC connections between each remote UE and the relay UE. This does not imply support of all PC5-RRC procedures between the remote UEs.

[To Discuss]

Discovery

Proposal 1: In U2U relay, the remote/relay UE in RRC\_CONNECTED can acquire discovery configuration via dedicated signalling.

Proposal 2: In Model A, the relay UE should announce the UE list in a discovery announcement message containing UEs for which the quality of PC5 link between the relay UE and the said UE is above a certain threshold. If agreed, LS is sent to SA2.

Proposal 3a: RAN2 to discuss if the condition for triggering discovery message transmission in remote UE should be specified separately from the condition for relay (re)selection.

Proposal 3b: If P3a is agreed, RAN2 to discuss if remote UE can trigger a discovery procedure when the direct link falls below a threshold.

Proposal 3c: If P3a is agreed, RAN2 to discuss if remote UE can trigger a discovery procedure when the link between the remote UE and the serving relay UE falls below a threshold.

Proposal 5: For model-B discovery, source remote UE, upon discovery response message reception, selects a relay UE only if the PC5 RSRP towards the relay UE is above a configured threshold.

Relay (re)selection

Proposal 6: If different configured thresholds for SL-RSRP and SD-RSRP are needed or not can wait for RAN1/RAN4 LS reply.

Proposal 8: Each remote UE can trigger relay selection based on the direct link quality.

Discussion:

Lenovo clarify that this was previously agreed only for reselection.

Apple wonder how the remote UE can have relay selection measurements before initiating transmission of discovery messages; they think the link quality should trigger discovery first and then selection. Intel understand that selection should trigger discovery.

Lenovo indicate that the assumption of the proposal is that two remote UEs are communicating on the direct link, so they can measure it directly; they think the relation between discovery and selection can be separately discussed.

vivo want to clarify the discovery and selection triggering; there are separate conditions described in Rel-17, but the contents of the conditions are actually the same. They think we can follow the U2N case.

Agreement:

Each remote UE (source or destination) can trigger relay selection based on the direct link quality. FFS interaction between discovery and selection.

Proposal 13: RAN2 to discuss if U2U relay can indicate one of the following information related to the second hop to the source remote UE after relay link between source remote UE and target remote UE has been established.

- An indication to indicate that the link between the target remote UE and U2U relay is below a threshold;

- PC5 RSRP of second hop between relay UE and target remote UE.

Proposal 14a: During relay reselection, reselection towards direct link is supported.

Proposal 14b: If P14a can be agreed, RAN2 to discuss whether AS criterion is needed for switching back from indirect to direct link.

Proposal 15: RAN2 to discuss if two remote UE may select two different relay UEs for communicating each other. If yes, send LS to inform SA2.

Authorization (SA2 LS)

Proposal 17: RAN2 to discuss if the authorization information is needed for L2/L3 U2U relay operation.

Discussion:

Qualcomm think for L3 no authorization is needed; they assume it can be transparent to gNB. For L2, they think discussion may be needed.

Huawei wonder if “not needed” means that the legacy V2X authorization information applies, or no authorization at all. They understand that U2U relay can still request a configuration for SL from the network, which will require some authorization.

vivo agree it is not needed for L3, but to Huawei’s point, they think we still need the legacy authorization to act as a sidelink UE.

Apple wonder why we differentiate L2 and L3; they do not see that the gNB behaviour will be different.

Ericsson think we need more time to analyse the question.

CATT wonder if we can leave it to SA2.

LG tend to agree that if we support mode 1, it is good to have some authorization, since the gNB allocates resources. They wonder if the gNB can differentiate discovery behaviour for U2N vs. U2U; if not, one solution could be using the legacy authorization. They agree more time would be useful.

Agreement:

Postpone replying to the SA2 LS on authorization.

SRAP design and E2E PC5 link

Proposal 18a: RAN2 to agree multiplexing of different destinations in the same RLC channel is supported. [14:2]

Proposal 18b: If P18a is agreed, RAN2 to discuss if LS to SA2 is needed to ensure that the same PC5 unicast link is used between source remote UE and relay UE when the source remote UE communicates with different destination UEs through the same relay UE.

Proposal 18c: RAN2 to discuss if multiplexing of the different bearers from the different source remote UEs into the same RLC channel in the second hop is supported.

Proposal 19: RAN2 to discuss if Relay UE determines the egress RLC Channel based on the mapping of E2E bearer ID and egress RLC Channel mapping as L2 U2N relay.

Proposal 20a: RAN2 to discuss for L2 U2U relay case, SRAP header should include:

- Option 1: Target remote UE ID (layer-2 ID) in first hop and source remote UE ID (layer-2 ID) in second hop.

- Option 2: Target remote UE ID (local ID) in first hop and source remote UE ID (local ID) in second hop.

- Option 3: Both source remote UE ID (layer-2 ID) and target remote UE ID (layer-2 ID) included in each hop.

- Option 4: Both source remote UE ID (local ID) and target remote UE ID (local ID) included in each hop.

- Option 5: A common ID for a pair between source UD and target remote UE included in each hop.

Proposal 20b: If local ID or an ID for the pair between source remote UD and target remote UE is agreed in P20a, RAN2 to discuss which node (relay UE or source remote UE) assign this ID.

Proposal 21b: If P21a can be agreed, a one-to-one correspondence between end-to-end PC5 RRC connection and end-to-end PC5 unicast link is supported as legacy.

Proposal 21c: RAN2 to discuss which one of the following options can be considered as ‘a PC5-RRC connection is established’.

- Option 1: E2E PC5 unicast link is established

- Option 2: Hop-by-hop PC5 RRC connections are established for UE-to-UE Relay.

Proposal 22a: RAN2 to discuss which layer (AS layer or upper layer e.g PC5-S) is responsible for QoS split.

Proposal 22b: RAN2 to discuss which node is responsible for QoS split.

- Option 1: source remote UE

- Option 2: relay UE

Proposal 23: RAN2 to discuss using the end-to-end bearer ID as input for the L2 U2U relay ciphering and deciphering at PDCP, and LS is sent to SA3 for checking feasibility.

* [AT121bis-e][431][Relay] SRAP proposals on U2U relay (Lenovo)

Scope: Discuss the SRAP proposals (P18a to P23) for discussion from R2-2304194 and converge where possible.

Intended outcome: Report to CB session in R2-2304304

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304304](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304304%20%5bAT121bis-e%5d%5b431%5d%5bRelay%5dSRAP%20proposals%20on%20U2U%20relay%20(Lenovo).docx) [AT121bis-e][431][Relay] SRAP proposals on U2U relay Lenovo discussion Rel-18

[Easy Proposal]

Bearer Multiplexing

[23:0]Proposal 1: Multiplexing of different destinations in the same RLC channel of the first hop is supported.

[23:0]Proposal 2: RAN2 confirms that multiplexing of the different bearers from the different source remote UEs into the same RLC channel in the second hop is supported.

[21:2]Proposal 3: LS to SA2 is NOT needed in case P1 or P2 is agreed.

Bearer mapping

[21:1]Proposal 4: Relay UE determines the egress RLC Channel based on the mapping of E2E bearer ID and egress RLC Channel mapping for a particular pair between source remote UE and target remote UE.

E2E PC5 link

[23:0]Proposal 6: A one-to-one correspondence between end-to-end PC5 RRC connection and end-to-end PC5 unicast link is supported as legacy.

[22:1]Proposal 7: E2E PC5-RRC connection is considered to be established after a corresponding E2E PC5 unicast link is established in case the configuration for E2E SL-SRBs is specified in RRC specification.

Discussion:

LG think we need to send an LS to SA2 on P1/P2.

Apple think there is no need for an LS. On P7, they understand the e2e configurations have to be there, so there is a bit of a gap in the proposal. Lenovo indicate that it was pointed out that the legacy PC5-RRC connection is considered to be established when the PC5 unicast link is established, but it depends on default configurations, and this is based on the same premise to align with legacy.

ZTE think the second “mapping” in P4 is redundant.

Agreements:

Multiplexing of different destinations in the same RLC channel of the first hop is supported.

RAN2 confirms that multiplexing of the different bearers from the different source remote UEs into the same RLC channel in the second hop is supported.

Relay UE determines the egress RLC Channel based on the mapping of E2E bearer ID and egress RLC Channel for a particular pair between source remote UE and target remote UE.

A one-to-one correspondence between end-to-end PC5 RRC connection and end-to-end PC5 unicast link is supported as legacy.

E2E PC5-RRC connection is considered to be established after a corresponding E2E PC5 unicast link is established. FFS how configurations for e2e SL-SRBs are supported.

QoS split

[Easy]Proposal 8a: RAN2 to confirm that AS layer is responsible for QoS split in L2 U2U relay.

[15:6] Proposal 8b: If AS layer is agreed to perform QoS split, relay UE is responsible for QoS split in L2 U2U relay.

End-to-end security

[21:2] Proposal 9: E2E bearer ID is used as input for the L2 U2U relay ciphering and deciphering at PDCP, and LS is sent to SA3 for checking feasibility.

Discussion:

Ericsson think we need more time to consider this and we should wait until May to send the LS.

vivo think there is an argument about whether to use all bits of the bearer ID, and this should be clarified online. Lenovo indicate that the legacy operation uses part of the LCID, so using part of the bearer ID would align.

Huawei would prefer to reuse L2ID, but they can follow majority view. They want to clarify the actual meaning of “bearer ID” is “configuration index”.

Agreements:

WA: E2E bearer ID (i.e., configuration index in the list of SLRB configurations) is used as input for the L2 U2U relay ciphering and deciphering at PDCP.

LS to SA3 to confirm the feasibility of using the configuration index.

* [Post121bis-e][402][Relay] LS to SA3 on configuration index of U2U relay bearers for security (Lenovo)

Scope: Draft an LS to SA3 to confirm the feasibility of using the configuration index as an input to security.

Intended outcome: Approved LS in R2-2304559

Deadline: Short

SRAP Header

[Easy][23:0]Proposal 5a: Option 1 (Target remote UE ID (layer-2 ID) in first hop and source remote UE ID (layer-2 ID) in second hop) is excluded.

[ToDis] Proposal 5b: In Rel-18 with a single relay, ID(s) in option 4/5 should be same in each hop to avoid replacing ID in the SRAP header when relay UE transfers the received packet.

[ToDis] Proposal 5c: RAN2 to discuss which ID (24-bit layer-2 ID or short ID) can be used in SRAP header.

- If 24-bit layer-2 ID is used in the SRAP header, Option 3 (both source remote UE 24-bit layer-2 ID and target remote UE 24-bit layer-2 ID included in each hop) can be agreed.

[ToDis] Proposal 5d: If short ID is agreed, RAN2 to discuss which option can be agreed.

- Option 2: Target remote UE ID (local ID) in first hop and source remote UE ID (local ID) in second hop. (8)

- Option 4: Both source remote UE ID (local ID) and target remote UE ID (local ID) included in each hop. (11)

- Option 5: A local pair ID for a pair between source UD and target remote UE included in each hop. (9)

[Easy] [15:1] Proposal 5e: If short ID (one of Option 2, Option4 and Option 5) is agreed, relay UE is responsible for ID assignment.

The following documents will not be individually treated

[R2-2302492](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302492%20Identification%20for%20bearer%20mapping%20and%20Connection%20establishment.docx) Identification for bearer mapping and Connection establishment NEC discussion NR\_SL\_relay\_enh-Core

[R2-2302601](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302601%20Disussion%20on%20U2U%20Relay.docx) Discussion on U2U Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302643](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302643%20-%20Discussion%20on%20U2U%20Relay.docx) Discussion on U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302701](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302701_Sidelink%20UE-to-UE%20Relaying_Intel.docx) Discussion on L2 UE-to-UE relaying aspects Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2302791](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302791%20Further%20issues%20on%20U2U%20relay.docx) Considerations on U2U relay (re)selection and Local ID assignment Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core R2-2301355

[R2-2302836](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302836_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

[R2-2302902](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302902_Discussion_on_Relay_reselection_Discovery.docx) Discussion on Relay (Re-)selection and Discovery Ericsson España S.A. discussion Rel-18

[R2-2302921](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302921%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

[R2-2302922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302922%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

[R2-2302997](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302997-Control%20plane%20procedure%20and%20adaptaion%20layer%20for%20U2U%20relay.docx) Control plane procedure and adaptaion layer for U2U relay LG Electronics Inc. discussion Rel-18

[R2-2303004](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303004%20Discussion%20on%20Relay%20discovery%20and%20(re)selection.doc) Discussion on U2U Relay discovery and (re)selection ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303005](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303005%20Discussion%20on%20L2%20specific%20issues%20and%20gNB%20involvement%20in%20U2U%20Relay.doc) Discussion on U2U relay L2-specific functionality ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303012](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303012%20Multiplexing%20and%20UE%20ID%20in%20the%20adaptation%20layer.doc) Multiplexing and UE ID in the adaptation layer Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303088](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303088.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303222%20Discussion%20on%20L2%20U2U%20relay%20v1.0.docx) Discussion on L2 U2U relay Lenovo discussion Rel-18

[R2-2303336](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303336%20SRAP%20design%20for%20U2U%20sidelink%20relay%20-cln.doc) SRAP design for U2U Sidelink Relay Samsung R&D Institute UK discussion

[R2-2303339](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303339_Discussion%20on%20the%20common%20L2%20L3%20parts%20for%20U2U%20relaying.docx) Discussion on the common L2 L3 parts for U2U relaying vivo discussion

[R2-2303340](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303340_%20Discussion%20on%20the%20L2%20specific%20parts%20for%20U2U%20relaying.docx) Discussion on the L2 specific parts for U2U relaying vivo discussion

[R2-2303388](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303388%20Discussion%20on%20U2U%20relay%20issues.doc) Discussion on open issues on UE-to-UE Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303486](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303486%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303506](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303506-%20Layer-2%20specific%20part%20on%20U2U%20Relay.docx) Layer-2 specific part on U2U Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2303545](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303545%20Discussion%20on%20U2U%20relay.docx) Discussion on U2U relay CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303572](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303572.doc) Discussion on UE-to-UE relay Spreadtrum Communications discussion Rel-18

[R2-2303608](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303608+Discussion%20on%20NR%20sidelink%20U2U%20relay.doc) Discussion on U2U relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303648](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303648_U2U_relay.docx) Considerations for U2U L2 relay operations Kyocera discussion

[R2-2303782](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303782%20U2U%20relay%20discovery%20selection%20reselection%20SRAP%20QoS.docx) U2U relay – Relay UE discovery / (re)selection, SRAP, QoS Handling Beijing Xiaomi Mobile Software discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303934](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303934%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

[R2-2303935](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303935%20Discussion%20on%20E2E%20security%20for%20supporting%20L2%20UE-to-UE%20relay.docx) Discussion on E2E security for supporting L2 UE-to-UE relay ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core R2-2301538

[R2-2303989](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303989%20Integrated%20U2U%20relay%20discovery.doc) Integrated U2U relay discovery Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303990](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303990%20QoS%20and%20Bearer%20configuration%20for%20U2U%20relaying.doc) QoS and Bearer configuration for U2U relaying Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core R2-2301171

[R2-2303991](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303991_Sidelink%20U2U%20Discovery%20and%20reselection_Intel.docx) Discovery and relay reselection open aspects Intel Corporation discussion NR\_SL\_relay-Core

[R2-2304074](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304074-U2U.doc) UE-to-UE relay (re)selection Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304123](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304123%20Discussion%20on%20L2%20U2U%20Relay%20v01.docx) Discussion on L2 U2U Relay MediaTek Inc. discussion Rel-18

### 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.

Lossless i2x path switching (treat jointly)

[R2-2303110](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303110%20-%20Discussion%20on%20lossless%20data%20forwarding%20for%20inter-gNB%20service%20continuity.docx) Discussion on lossless data forwarding for inter-gNB service continuity OPPO, Xiaomi, Qualcomm Incorporated, Ericsson, Lenovo discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1 Rely on the existing solutions (e.g., PDCP SR, BSR…) to achieve the lossless path switching in Rel-18.

[R2-2302923](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302923%20(R18%20SL%20Relay%20WI_AI793%20Lossless%20Service%20Continuity).doc) Lossless path switching from indirect to indirect/direct InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: Select one of the following solutions for packet loss prevention during path switching from indirect:

1. Relay UE delaying the sending of RLC ACKs over SL until the reception of the ACKs for the corresponding RLC packets over Uu (or vice versa for the DL).

2. PDCP re-establishment retransmits PDUs that are already ACKed by lower layers.

3. Reception of PDCP status PDU after path switching results in retransmission of unACKed PDUs.

Discussion:

Huawei think we discussed this extensively last meeting and there was significant support for enhancements to the procedure; they think the existing procedures do not support lossless path switch and we should focus on possible solutions.

Nokia agree with Huawei.

OPPO understand the positions but still think there are existing mechanisms that can work, e.g., PDCP SR for DL and source gNB holding the relay UE for UL.

MediaTek agree with Huawei and Nokia, and they support the third option from the InterDigital paper.

Qualcomm understand that the first paper proposal does not repeat the previous discussion. On InterDigital’s proposal, they consider that the solutions will introduce a large burden for the UE because of buffering PDCP SDUs.

Ericsson think we have been going through a cycle and the existing functionality can clearly support lossless operation. They also think there is no clear requirement to have lossless path switch in the objective or from the plenary.

Xiaomi think the network implementation can ensure lossless, and they wonder if we should ask RAN3 to confirm.

Qualcomm think RAN3 have discussed it already without conclusion, and they think we need to rely on technical discussion.

vivo wonder why the performance of Rel-17 is not acceptable. Apple think it is different for inter-gNB, because a single gNB implementation cannot solve it and some missing DL packets will not be forwarded.

vivo think the difference referred to by Apple is in RAN3 scope.

InterDigital point out we agreed last meeting that there is an issue.

NEC wonder if we should capture additional solutions from other contributions.

Qualcomm understood that the PDCP status report we took as baseline was the existing, unenhanced PDCP status report. They see the InterDigital solutions as burdensome for the UE.

InterDigital understand that the discard timer prevents an eternal buffering issue, and we agreed last meeting to do something beyond the current mechanism. Qualcomm think the discard timer could be long, and there are simple solutions based on forwarding between gNBs.

Intel think the proposed agreement does not add much to what we had, and the two papers are in different directions regarding where the PDCP SR is sent (source or target gNB). They think we could capture these two families of solutions and narrow down next meeting. On the discard timer issue, they think InterDigital’s solution 2 may cause unnecessary retransmissions, but if we rely on the discard timer we need to discuss how long the source gNB keeps data buffered.

* [AT121bis-e][432][Relay] Candidate solutions for lossless delivery (NEC)

Scope: Evaluate candidate solutions for lossless delivery (DL/UL) in U2N service continuity. Intention is to capture solutions for down-selection next meeting.

Intended outcome: Report to CB session in R2-2304305

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304305](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304305%20Final%20Summary%20%5bAT121bis-e%5d%5b432%5d%5bRelay%5d%20Candidate%20solutions%20for%20lossless%20delivery%20(NEC).docx) Summary of [AT121bis-e][432]Candidate solutions for lossless delivery NEC discussion NR\_SL\_relay\_enh-Core

Proposal-2: For uplink lossless data delivery for path switch, Solution-U3 is taken as the baseline solution and keep Solution-U5 on the table for further decision at the next meeting.

Proposal-3: For downlink lossless data delivery for path switch, Solution-D4 is taken as the baseline solution and keep Solution-D3/D5 on the table for further decision at the next meeting.

Discussion:

Qualcomm cannot agree P2; they see critical issues for U3, but they could accept keeping U3/U5 on the table for downselection with no identified baseline.

Huawei support the proposals and think there were clear majorities for U3 and D4.

NEC indicate that based on the discussion, the downselection was fairly clear; they think U3 is aligned with the previous meeting’s agreement about using PDCP SR-based solutions, and they think we should send an LS to RAN3.

InterDigital agree with Huawei and NEC, and think we are not agreeing to U3 but can take it as a baseline.

Nokia can go with the proposals, but they have serious concerns with U5.

Intel want to keep U6 as a candidate; it was added late and they see it as close to U3. They would be willing to generalise U3 to consider either source or target gNB.

Ericsson agree with Intel and see U6 as fundamentally similar to U3.

InterDigital can go with the majority on the LS, but they think RAN3 already left the decision to us.

NEC think we should send the LS for information.

OPPO, vivo, and Lenovo think we should not send an LS. OPPO understand that companies will anyway coordinate internally, and considering the possibility of a final decision next meeting, they think it would be safer to inform RAN3 once we have a clear conclusion. They would prefer an LS next meeting.

vivo want to avoid a race condition between RAN2 and RAN3.

Qualcomm have the same view and think it is not helpful to RAN3 if we send the LS before a final decision.

Intel think we should inform RAN3 about D4 since it has RAN3 impact, but they can accept coordinating internally.

Agreements:

For uplink lossless data delivery for path switch, continue considering solutions U3 and U5 from R2-2304305. Other solutions are not pursued.

For downlink lossless data delivery for path switch, Solution-D4 is taken as the baseline solution and keep Solution-D3/D5 on the table for further decision at the next meeting.

Additional topics

[R2-2303006](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303006%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

Proposal 1: For i2i scenario, for serving U2N relay UEs, when SL-RSRP is unavailable, SD-RSRP is used as the measurement quantity. For candidate U2N relay UEs, SD-RSRP is used as the measurement quantity.

Proposal 2: For inter-gNB i2d path switch, the contents in RRC Reconfiguration message for Remote UE is the same as legacy NR RRC Reconfiguration with sync.

Proposal 3: For inter-gNB d2i and i2i path switch, the sl-PathSwitchConfig within ReconfiguraionWithSync can be reused to indicate the path switch configuration for remote UE. Details can be discussed in stage 3.

Proposal 4: During inter-gNB i2d/i2i path switch, upon receiving UE context release about remote UE from the target gNB, the source gNB sends RRC reconfiguration to relay UE to release remote UE related configuration.

[R2-2302493](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302493%20Support%20of%20Lossless%20Path%20Switching%20.docx) Support of Lossless Path Switching NEC discussion NR\_SL\_relay\_enh-Core

[R2-2302602](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302602%20Consideration%20on%20Service%20Continuity%20Enhancements%20for%20L2%20U2N%20Relay.docx) Considerations on Service Continuity Enhancements for L2 U2N Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302859](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302859%20SL%20Relay%20lossless%20delivery.docx) Discussion on lossless data delivery during inter-gNB path switching Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh

[R2-2302860](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302860%20Service%20continuity%20issues%20for%20Inter-gNB%20path%20switching%20of%20L2%20U2N%20relay.docx) Discussion on service continuity issues for Inter-gNB path switching of L2 U2N relay Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh

[R2-2302869](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302869%20-%20lossless%20path%20switching%20and%20measurement%20event%20Z2.docx) Discussion on lossless path switching and measurement events Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2302903](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302903_Discussion_on_Inter_gNB_Service_Continuity.docx) Discussion on Inter-gNB Service Continuity Ericsson España S.A. discussion Rel-18

[R2-2302971](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302971_Discussion%20on%20Service%20Continuity%20Enhancements.docx) Discussion on Service Continuity Enhancements NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302995](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302995-Path%20switching%20procedure%20for%20the%20service%20continuity%20enhancement.docx) Path switching procedure for the service continuity enhancement LG Electronics Inc. discussion Rel-18

[R2-2303089](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303089.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303117](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303117.docx) Discussion on service continuity enhancement Xiaomi discussion

[R2-2303223](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303223%20Service%20continuity%20for%20Inter-gNB%20path%20switching%20v1.0.docx) Service continuity for Inter-gNB path switching Lenovo discussion Rel-18

[R2-2303341](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303341_Remaining%20issues%20on%20service%20continuity%20enhancement%20for%20L2%20U2N%20relay.docx) Remaining issues on service continuity enhancement for L2 U2N relay vivo discussion

[R2-2303389](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303389%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

[R2-2303507](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303507-%20Scenarios%20and%20solution%20on%20lossless%20delivery%20during%20path%20switch%20from%20indirect%20path%20to%20target%20path.docx) Scenarios and solution on lossless delivery during path switch from indirect path to target path Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2303546](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303546%20Discussion%20on%20service%20continuity.docx) Discussion on service continuity CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303558](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303558%20Discussion%20on%20service%20continuity.docx) Discussion on Service Continuity Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303564](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303564%20Service%20continuity%20enhancements%20support%20for%20L2%20U2N%20relay.doc) Service continuity enhancements support for L2 U2N relay Spreadtrum Communications discussion Rel-18

[R2-2303609](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303609_CP%20and%20UP%20aspects%20of%20inter-gNB%20path%20switching.docx) CP and UP aspects of inter-gNB path switching China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304075](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304075-U2N.doc) remaining issues for U2N path switching with lossless delivery Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304124](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304124%20Lossless%20data%20delivery%20in%20the%20inter-gNB%20cases.docx) Lossless data delivery in the inter-gNB cases MediaTek Inc. discussion Rel-18

### 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).

Rapporteur update from RAN2#121

[R2-2303857](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303857%20Resubmission%20of%20%5bPre121%5d%5b407%5d%20Summary%20of%20AI%208.9.4%20MP.doc) Resubmitted proposals from [Pre121][407] Summary of AI 8.9.4 LG Electronics France discussion Rel-18 NR\_SL\_relay\_enh-Core

[HP proposals for easy agreement]

High Priority Proposals for Scenario 1

Proposal 1.8A: [HP] The concept of the existing ‘primary path and primary RLC entity’ is adopted for each MP split bearer configuration.

Proposal 1.8B: [HP] PDCP control PDU only transmits on the primary RLC entity same as legacy.

Discussion:

Nokia understand that the only argument for the primary RLC entity is that we already have it; from UP perspective they understand that it is only used to limit the transmission path when the data volume is low, and here they think both paths should be used.

ZTE agree with P1.8A and consider that the primary path also matters for the duplication scenario, and it would be better to follow the legacy behaviour. On P1.8B, they see that it targets the duplication scenario, i.e., PDCP CPDUs would not be duplicated, but for the split scenario they think there is no such restriction. OPPO agree with ZTE.

Huawei support the two proposals, and considering limited time, they think reusing the current mechanism is enough.

vivo also agree with ZTE and think we should not spend too much time.

Qualcomm support both proposals.

Ericsson are OK with the proposals, but want to clarify that it targets DRBs and we could capture that explicitly. LG indicate that the proposals do not intend to target DRBs only.

Nokia wonder if it means we reuse the existing mechanism, e.g., gNB configures which path is the primary. Chair understands we could change the details but we reuse the underlying concept. LG have the same understanding.

Agreements:

The concept of the ‘primary path and primary RLC entity’ is adopted for each MP split bearer configuration according to the existing definition.

In case of duplication, PDCP control PDU only transmits on the primary RLC entity same as legacy.

High Priority Proposals for Scenario 2

Proposal 2.4A: [HP] non-split SRB1 and 2 over indirect path is not supported in Scenario 2.

Proposal 2.4B: [HP] split SRB1 and 2 are supported in Scenario 2 and primary path of the split SRB 1 and 2 is always on direct path.

Proposal 2.6B: [HP] If UE-UE link failure is detected on indirect path in Scenario 2, the remote UE can report UE-UE link failure to gNB over direct path, based on what RAN2 will agree for Scenario 1 assuming that the corresponding procedure is agreed for Scenario 1.

Discussion:

NEC think for P2.6B, both relay and remote UE could report.

Xiaomi think P2.6B should be postponed until the mechanism for scenario 1 is clear.

LG think we have to support reporting to the gNB, and the details may need further discussion. Ericsson and Huawei agree with LG.

Lenovo wonder whether the remote UE can detect the failure in scenario 2; it seems to depend on the link technology. Ericsson think we agreed the details are out of RAN2 scope.

Agreements:

Non-split SRB1 and 2 over indirect path is not supported in Scenario 2.

Split SRB1 and 2 are supported in Scenario 2 and primary path of the split SRB 1 and 2 is always on direct path.

If UE-UE link failure is detected on indirect path in Scenario 2, the remote UE can report UE-UE link failure to gNB over direct path. Details of the reporting mechanism can be further discussed.

[Other proposal for easy agreement]

Proposal 3: Upon RRCReconfiguration message for indirect path addition from direct path, the remote UE sends the RRCReconfigurationComplete message to gNB via the added indirect path for both scenario 1 and 2, when split SRB1 is configured.

Discussion:

CATT have some concern because this would diverge from the legacy mechanism, so they foresee considerable spec impact.

Nokia understand that the reason we did this in Rel-17 was that there was no other option, but here we have both paths, and they think the gNB should control which path is used. E.g., direct path may be faster.

InterDigital agree with P3; they think we cannot really compare to legacy operation because it is not two separate cell groups, and this is needed for the idle/inactive relay.

ZTE agree with the principle of the proposal, but they think it could be more specific about the conditions; they see that it should be when split SRB1 with duplication (or with primary path as indirect path) is configured.

Apple agree with Nokia; considering P1.8A, they think we should follow the legacy operation and leave the path up to network implementation.

Huawei understand that the intention is that the complete message goes on the indirect path when duplication is configured. They understand that we have an FFS on whether the primary path can be the indirect path.

Qualcomm agree with the proposal as it is, and they assume that if the relay is a Rel-17 relay, the remote UE must use the indirect path.

[HP proposals for discussion]

High Priority Proposals for Scenario 1

Proposal 1.7A: [HP] The network is allowed to configure SRB1 and SRB2 on same path or different paths.

Proposal 1.7B: [HP] The bearer type (i.e. direct bearer, indirect bearer, or multi-path bearer) of SRB1 and SRB2 can be independently configured by the network.

Discussion:

Ericsson are not OK with allowing SRB1/SRB2 on different paths. Qualcomm also think they should be on the same path, and further that it should always be the direct path, which may be more reliable.

MediaTek think they should be on the same path and wonder about the motivation for configuring them differently.

LG indicate that the proposal reflects a split in the contributions. They think from a signalling perspective, different paths can be allowed, but the network can always choose to configure them on the same path.

Nokia agree that there is no motivation for different paths, but they think it can be left to the network. They think RAN2 could decide not to optimise for different paths.

vivo see no need for a restriction on separating SRB1 and SRB2 if SRB1 is on the direct path. On P1.7B, they think the indirect bearer could be removed.

InterDigital are OK with Nokia’s suggestion on P1.7A. On P1.7B, they are a bit sceptical about removing the indirect bearer, because we already agreed that we can have non-split indirect SRB1.

vivo think SRB1 should not be able to go on the indirect path; they do not see a motivation for this. Xiaomi think it is motivated because the remote UE may be moving out of direct coverage and have the indirect path be more reliable; they do not see a technical problem with using the indirect path.

Huawei think non-split SRB1 on indirect path is not needed; there is a restriction in legacy operation that non-split SRB1 cannot be configured on SCG, and we already agreed that the PCell is the Uu cell, so they do not see the coverage argument as correct. They would like to avoid the spec and test complexity of allowing it.

OPPO think the indirect bearer should be omitted from P1.7B.

ZTE agree with the original proposals; the UE may initially access through the indirect path, at which time only the indirect bearer can be configured, and they think the network should not be forced to reconfigure to the direct path if the indirect path is good enough.

Ericsson think we should not do flexibility for its own sake. They see that we know the direct path is good and do not see why we should use the indirect path for signalling. They think we would only add the direct path in the case mentioned by ZTE if the UE is near cell centre.

InterDigital think we should keep the existing agreements allowing non-split SRB on either path and having the PCell on the direct path.

Ericsson note that the flexibility is still there through using split SRB if necessary. InterDigital understand that this would lead to cases where the UE was required to transmit on the direct path even though indirect is more reliable.

Samsung think the key point is whether we can configure non-split SRB1/SRB2 on indirect path. They see no reason to restrict SRB2 but maybe some reason to restrict SRB1, since the PCell is on the direct path. The bearers have different priorities and they think it might be preferable to have higher reliability for SRB1.

High Priority Proposals for Scenario 2

Proposal 2.1B: [HP] The remote UE reports relay UE’s ID to gNB for indirect path addition, when both UEs are in RRC\_CONNECTED. FFS which UE ID is used as relay UE’s ID. FFS for relay UE’s serving cell information.

Proposal 2.1C: [HP] RAN2 is requested to discuss whether to support more than one relationship between relay UE and remote UE.

Proposal 2.3: [HP] RAN2 is requested to discuss whether to support indirect path change in Scenario 2

[MP proposals, discussion depending on available time]

Middle Priority Proposals for Scenario 1

Proposal 1.8C: [MP] Dynamic duplication (de)activation of a DRB is supported based on MAC CE on the direct path for MP split bearer with duplication. FFS whether dynamic duplication (de)activation is supported for a SRB. FFS whether to reuse the existing Duplication Activation/Deactivation MAC CE and Duplication RLC Activation/Deactivation MAC CE. FFS whether to support (de)activation on indirect path.

Proposal 1.8D: [MP] When configuring duplication for a MP split bearer, RRC can set the state of PDCP duplication (either activated or deactivated) at the time of (re-)configuration.

Proposal 1.8E: [MP] The existing data volume threshold (i.e. ul-DataSplitThreshold) can be reused for MP split bearer.

* [AT121bis-e][419][Relay] Remaining high-priority proposals on multi-path (LG)

Scope: Discuss the remaining HP proposals from R2-2303857.

Intended outcome: Report to CB session in R2-2304294

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304294](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304294%20Report%20of%20%5bAT121bis-e%5d%5b419%5d%5bRelay%5d.doc) Report of [AT121bis-e][419][Relay] Remaining high-priority proposals on multi-path (LG) LG Electronics Inc. discussion Rel-18

Based on majority’s views:

Proposal A2.1: When split SRB1 with duplication is configured, the remote UE sends the RRCReconfigurationComplete message to gNB via the added indirect path for Scenario 1. FFS other condition(s) on SRB1 configuration to send the RRCReconfigurationComplete message on the added indirect path.

Proposal A4.1: When one of the following conditions is met, the remote UE sends the RRCReconfigurationComplete message to gNB via the direct path for Scenario 1. FFS on need for additional condition.

- when split SRB1 with duplication is configured

- when primary RLC entity of split SRB1 is on direct path

- when non-split SRB1 is configured on direct path

Proposal A2.2: When split SRB1 with duplication is configured, the remote UE sends the RRCReconfigurationComplete message to gNB via the added indirect path for Scenario 2.

Proposal A4.2: When one of the following conditions is met, the remote UE sends the RRCReconfigurationComplete message to gNB via the direct path for Scenario 2.

- when split SRB1 with duplication is configured

- when primary RLC entity of split SRB1 is on direct path

- when non-split SRB1 is configured on direct path

Discussion:

Intel are OK with the proposals, but in P A2.1 and P A4.1, they think we should say “can send” instead of “sends”, because there are other conditions under which this message could be sent.

LG think it would be strange to add “can”, because we are talking about a particular condition where the remote UE shall send the message in a particular way.

Qualcomm want to clarify in P A4.1 why we have a different behaviour from A2.1 in the first bullet. LG indicate that A2.1 is for indirect path delivery and A4.1 is for direct path delivery, and in the duplication case both apply because both paths are used.

Ericsson wonder what the FFS is for in the first proposal. Nokia understand it is because we have not decided if the primary path can be the indirect path, and it is for non-split SRB on the indirect path.

Agreements:

When split SRB1 with duplication is configured, the remote UE sends the RRCReconfigurationComplete message to gNB via both paths for Scenario 1.

When one of the following conditions is met, the remote UE sends the RRCReconfigurationComplete message to gNB via the direct path for Scenario 1. FFS on need for additional condition.

- when primary RLC entity of split SRB1 is on direct path

- when non-split SRB1 is configured on direct path

When split SRB1 with duplication is configured, the remote UE sends the RRCReconfigurationComplete message to gNB via both paths for Scenario 2.

When one of the following conditions is met, the remote UE sends the RRCReconfigurationComplete message to gNB via the direct path for Scenario 2.

- when primary RLC entity of split SRB1 is on direct path

- when non-split SRB1 is configured on direct path

Proposal B3: The bearer type configuration is provided per SRB without any optimization. It is up to network implementation whether to configure SRB1 and SRB2 with same or different bearer types. FFS on configuration of non-split SRB1 and non-split SRB2.

Discussion:

Qualcomm think we should restrict the non-split indirect case.

Ericsson agree with Qualcomm and think we could go in circles about flexibility.

Xiaomi think we did not conclude if non-split SRB on indirect is supported or not.

Agreements:

The bearer type configuration is provided per SRB. It is up to network implementation whether to configure SRB1 and SRB2 with same or different bearer types (within the bearer types that are supported).

FFS if there are cases where the configuration of non-split SRBs over indirect path is useful.

Proposal C1: The remote UE reports relay UE’s ID to gNB for indirect path addition, when both UEs are in RRC\_CONNECTED.

- Proposal C1a: Whether/how to be aware of the RRC state of Relay UE by Remote UE is up to UE implementation for scenario 2. FFS on need for relay UE’s serving cell information in the report to gNB.

Proposal C3: The UE ID reported to gNB for indirect path addition is C-RNTI.

Proposal C4: the remote UE reports only one relay UE’s ID to gNB for indirect path addition for scenario 2. FFS on indirect failure case.

Proposal C5: RAN2 de-prioritizes support of indirect path change for scenario 2 in Rel-18

Discussion:

Qualcomm think C1 requires the relay UE to be in RRC\_CONNECTED.

Samsung have a concern that there could be security issues in reporting C-RNTI.

LG and Apple think the idle/inactive case may not be needed, but OK to have further discussion. Xiaomi agree.

Agreements:

In scenario 2, if both remote and relay UE are in RRC\_CONNECTED, the remote UE reports relay UE’s ID to gNB for indirect path addition. Need for reporting in the idle/inactive case can be further discussed. FFS what ID is used.

Chair’s note: “In scenario 2” was added after the session for clarity in the above agreement, since the proposal in the input document was scoped to scenario 2.

Based on split views:

Proposal B1: RAN2 will further discuss whether support of non-split SRB1 and non-split SRB2 on the indirect path is essential and whether to re-confirm part of the previous agreement on support of non-split SRB1 on the indirect path for scenario 1 (i.e. the below brackets).

- For scenario 1, SRB1 and SRB2 can be configured on either the direct [or the indirect path,] or on both at least with duplication. FFS if they can be configured on different paths from one another.

- Upon detection of 3GPP-defined RLF failure in one path, remote UE (configured with MP) can report path failure via the alternative available path if [SRB1 is configured on the alternative path or] split SRB1 is configured.

[R2-2302924](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302924%20(R18%20SL%20Relay%20WI_AI794%20MultipathAspects).doc) Design Aspects for Multi-path InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[SRB configurations, overlap with previous document]

Proposal 1: Split SRB1/2 is supported for scenario 2 (up to network choice whether to configure it).

Proposal 2: Non-split SRB1/2 is allowed to be configured on the indirect path for scenario 2 (up to network choice whether to configure it).

Proposal 3: SRB1/SRB2 can be configured in different paths for both scenario 1 and scenario 2.

[Split bearers]

Proposal 4: DL transmission on split SRB1/SRB2 without duplication can be performed on either direct or indirect path (as decided by the network).

Proposal 5: UL transmission on split SRB1/SRB2 without duplication can be performed on either direct or indirect path. FFS on the associated conditions at the UE.

Proposal 6: Split bearer threshold-like mechanism is supported for a split DRB without duplication in multipath for determining when a UE can transmit data to either path. FFS on the differences with legacy DC split bearer threshold.

Proposal 7: For a split bearer without duplication, the network controls the amount of data routed by the UE to each of the paths when the split bearer threshold is exceeded.

Proposal 8: Discuss whether to support a CA-like approach where a split bearer can be configured with a single RLC entity common to both paths.

[Failure handling]

Proposal 9: In case of Uu-RLF, when non-split SRB1 is available on the indirect path and not suspended, the UE triggers report to network via the indirect path to report the failure, otherwise, RRC Re-establishment is initiated.

Proposal 10: New RRC messages are defined for 1) direct path failure (which the UE reports on the indirect path) and 2) indirect path failure (which the UE reports on the direct path). The messages contain at least a path-dependant failure type and measurement results.

Proposal 11: In addition to Uu-RLF and PC5-RLF, failure report is triggered by the remote UE in multipath and explicitly indicated to the network (with a failure type) for at least the following causes: 1) random access problems on direct path, 2) max number of RLC retransmissions on direct and indirect paths, 3) T312 expiry on the direct path, 4) LBT failure on the direct path, 5) BFR failure on the direct path, 6) BH RLF on the direct path, 7) reception of Uu RLF notification from relay UE on the indirect path, 8) reception of relay UE RRC failure on the indirect path, and 9) reception of relay UE cell reselection on the indirect path. FFS on the need to consider reception of relay UE HO on the indirect path as a separate cause.

Proposal 12: The UE starts a T316-like timer when the failure occurs in the primary path configured for SRB1 and the UE is configured to start T316-like timer.

Proposal 13: Upon detection of RLF on the path on which non-split SRB is configured, the remote UE can perform a re-establishment-like procedure via the other path. FFS on details.

[RRCReconfigurationComplete, overlap with previous document]

Proposal 14: When the indirect path is added and split SRB1 is configured, the remote UE transmits the RRCReconfigurationComplete message on the indirect path. Otherwise (SRB1 configured on direct path only), the remote UE always transmits a PC5-RRC message. FFS whether to define a new PC5-RRC message.

[Configuration for multi-path]

Proposal 15: RAN2 assumes a Rel17 relay UE can be configured by the network for multipath operation by configuring split SRB1 for this case.

Proposal 18: A Rel18 relay UE that serves as a multipath relay can be configured with different conditions for when to transmit discovery message. Details, including how to handle relay UEs that serve as both legacy relays and multipath relays, are FFS.

[Idle/inactive cases]

Proposal 16: Multipath at the remote UE can be maintained when the relay UE is moved to IDLE/INACTIVE.

Proposal 17: A remote UE transmits a PC5-RRC message prior to initiating uplink transmission on a split bearer when the relay UE is in RRC\_IDLE/RRC\_INACTIVE.

Proposal 19: A remote UE in multipath that is released to RRC\_IDLE/RRC\_INACTIVE can be configured to maintain either the direct path or relayed path.

Discussion:

OPPO tend to think there is no need to support idle/inactive cases in this release for either relay or remote.

Xiaomi think we only need to consider the relay UE in RRC\_CONNECTED, and if the relay UE is released to idle/inactive the multi-path should be released.

Ericsson wonder if the relay UE is in idle/inactive, whether it means the indirect path is suspended and we need to wake up the relay UE on coming back to connected. InterDigital confirm this is the general intention. Ericsson are OK with the proposals in this light.

LG tend to agree with OPPO and Xiaomi and think this is more of an optimization, but they also agree with P16, because the relay UE has to rely on the gNB to release the configuration rather than release autonomously. However, they do not see a need to support suspend/resume for multi-path.

Intel agree with OPPO/Xiaomi/LG. For P16, they think the gNB should be aware when the relay UE is moved to idle/inactive. They see P17 as an optimization and P19 as somewhat separate from multi-path.

InterDigital note that P16/P17 are on the relay UE, and P19 does not say that we should maintain multipath in idle/inactive but gives the network control of which path to release the remote UE to.

Huawei think we already agreed that the remote UE released to RRC\_INACTIVE will not store the indirect-path configuration. Chair recalls that this was about having the remote UE not store the multi-path configuration; Huawei think it implied no storage of the indirect path, to align with Rel-17.

Samsung wonder if there is spec impact if we do not support the relay UE in idle/inactive, and also how we can maintain one of the paths at the remote UE side in idle with no context.

Xiaomi agree with Samsung that P19 should only apply for RRC\_INACTIVE, and their understanding is that we agreed the multi-path configuration is not stored in inactive, so the gNB should first release the multi-path and then trigger the release.

OPPO agree with Huawei and think the legacy behaviour to trigger cell/relay selection can handle it.

InterDigital understand the intention of the earlier agreement to be that the UE would not maintain the multi-path configuration but move to single-path, and we did not mean to exclude maintaining the indirect path. They understand the relation to legacy is that we want to give the network control over where the UE goes.

Ericsson think when the relay UE goes to idle/inactive, it is not using the path, so they think there could be advantages in maintaining multi-path in this case.

Qualcomm understand we agreed that the remote UE can keep the direct path in RRC\_INACTIVE, and they wonder how resume over the indirect path will work. They think we would need to change PCell to the direct path.

LG think it is up to the gNB whether to release the multi-path configuration at the remote UE when the relay UE moves to idle/inactive, and this is consistent with the legacy behaviour.

* [AT121bis-e][430][Relay] Multi-path relay idle/inactive cases (InterDigital)

Scope: Discuss and attempt to converge on the candidate agreements from the multi-path discussion:

Multi-path at the remote UE is not maintained when the relay UE is moved to RRC\_IDLE/RRC\_INACTIVE in this release.

A remote UE in multipath that is released to RRC\_IDLE/RRC\_INACTIVE can apply legacy cell/relay selection behaviour, thus moving to single-path operation on either path according to implementation.

Intended outcome: Report to CB session in R2-2304303

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304303](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304303%20-%20summary%20of%20%5b430%5d_Multipath_Idle_Inactive_21_Rapp.docx) Summary of [AT121bis-e][430][Relay] Multi-path relay idle/inactive cases (InterDigital) InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1.1 – RAN2 assumes, for a remote UE and relay UE in RRC\_CONNECTED, the network releases the multipath configuration related to this relay at the remote UE before it releases the relay UE to RRC\_IDLE/RRC\_INACTIVE.

Proposal 1.2 – A remote UE in RRC\_CONNECTED, upon reception of Uu RLF indication from the relay UE, suspends transmissions on the indirect path and informs the network if SRB1 is available on the direct path and not suspended, otherwise triggers re-establishment. FFS whether to apply the same behaviour 1) when the relay UE informs the remote UE of HO; 2) When the relay UE moves to IDLE following expiry of dataInactivityTimer.

Proposal 2.1 – A remote UE in multipath that is released to RRC\_IDLE/RRC\_INACTIVE can apply legacy cell/relay selection behaviour, thus moving to single-path operation on either path according to implementation.

Discussion:

Ericsson think P1.1 should say “can”, not mandate the network behaviour.

OPPO think on P1.2, even though we have a previous agreement on non-split SRB1 on indirect path, we could refine the proposal to avoid misunderstanding (the word “available”). InterDigital indicate it aligns with the wording of previous agreements.

Nokia think the data inactivity timer does not consider the relay case, so there is a case that the timer allows the UE to go to idle while there is still traffic over PC5; thus they think this timer should not be configured for the relay UE.

ZTE think P1.2 should not have the FFS on the HO case, since this is under gNB control. They would prefer a solution like P1.1 where the network handles the remote UE before handing over the relay UE.

Ericsson would like to take P1.1 only from the remote UE perspective: “the remote UE will not support a multi-path configuration when the relay UE is in idle/inactive”.

Agreements:

WA: 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/RRC\_INACTIVE.

A remote UE in RRC\_CONNECTED, upon reception of Uu RLF indication from the relay UE, suspends transmissions on the indirect path and informs the network if SRB1 is available on the direct path and not suspended, otherwise triggers re-establishment. FFS whether to apply the same behaviour 1) when the relay UE informs the remote UE of HO; 2) When the relay UE moves to IDLE following expiry of dataInactivityTimer, if the timer is supported for the relay UE. This agreement does not imply any conclusion on non-split SRB1 on indirect path.

A remote UE in multipath that is released to RRC\_IDLE/RRC\_INACTIVE can apply legacy cell/relay selection behaviour, thus moving to single-path operation on either path according to implementation.

Scenario 2 aspects: sections 2.3.2, 2.5, and 2.7. Prioritise section 2.5 (potential urgent LS to SA2)

[R2-2303342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303342_Remaining%20Issues%20for%20Multi-path%20Scenario%201%202.docx) Remaining Issues for Multi-path Scenario 1&2 vivo discussion Late

[Section 2.5: LS to SA2]

Proposal 18 RAN2 to send a LS to SA2 for the requirements to support multi-path transmission authorization and subscription function for a UE acting as the remote UE in Scenario-2.

Discussion:

Qualcomm are OK to send an LS, but they wonder if it also applies to the relay UE.

MediaTek wonder what kind of response we would expect from SA2; will they indicate if the procedures can be reused?

LG wonder if the LS is really needed, since we assumed no impact on SA2 from scenario 2. vivo indicate that the authorisation is necessary, and the remote UE may report the relay UE ID, which may not work as specified for scenario 2. On MediaTek’s point, they understand that SA2 just need to take the issue into account.

Qualcomm think it makes sense to have authorisation for scenario 2.

LG think we should indicate that we did not anticipate CN impact but just want to avoid an inconsistency. Nokia, MediaTek, and Apple agree.

[Section 2.3.2: scenario 2]

Proposal 12 For Scenario-2, RAN2 to confirm the WA into agreement, i.e., leave it to relay and remote UE implementation on how to trigger the RRC\_IDLE/RRC\_INACTIVE target relay UE to initiate RRC connection establishment procedure.

Proposal 13 For Scenario-2, RAN2 assumes that remote UE will report the inter-UE relationship only after relay UE successfully entering RRC\_CONNECTED in this Release.

Proposal 14 For Scenario-2, RAN2 to decide which Option(s) is agreeable for remote UE to report the inter-UE relationship (e.g., relay UE’s C-RNTI and serving NCGI) to the gNB:

- Option 1: remote UE oriented solution, i.e., remote UE autonomously reports the inter-UE relationship with the relay UE after it triggers the relay UE successfully entering RRC\_CONNECTED.

- Option 2: NW controlled solution, i.e., remote UE only reports the inter-UE relationship with the relay UE after the gNB indication/reconfiguration.

[Section 2.7: bearer mapping in scenario 2]

Proposal 26 For Scenario-2, RAN2 confirm the WA into agreement, i.e. “Bearer identification except LCID is not needed in L2 PDU over Uu link in Scenario-2. Only 1:1 bearer mapping is supported over Uu link for the indirect path.”.

Proposal 27 For Scenario-2, detailed mapping configuration can include one indicator of remote UE’s RB to differentiate between RBs of relay UE itself and the ones of remote UE.

* [AT121bis-e][420][Relay] LS to SA2 on authorisation for scenario 2 (vivo)

Scope: Draft an LS to SA2 for the concern with support of multi-path transmission authorization and subscription function for a UE acting as the remote or relay UE in Scenario-2, calling their attention to the possible spec divergence. RAN2 background can be provided to the extent needed for the issue to be clear. Expected action is “take into account”.

Intended outcome: Approved LS (without CB if possible) in R2-2304458

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304458](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304458%20_Draft%20LS%20to%20SA2%20on%20authorization%20for%20multi-path%20scenario%202.docx) Draft LS to SA2 on authorization for multi-path Scenario 2 vivo LS out Rel-18 NR\_SL\_relay\_enh-Core, FS\_5G\_ProSe\_Ph2 To:SA2 Cc:RAN3

* Approved as R2-2304506 (email discussion [AT121bis-e][420])

[R2-2302569](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302569%20-%20Discussion%20on%20multi-path%20Relay_V2.docx) Discussion on multi-path SL relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302603](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302603_Discussion%20on%20Multi-path%20Scenario1.docx) Discussion on Multi-path Scenario 1 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302604](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302604_Discussion%20on%20Multi-path%20scenario2.docx) Discussion on Multi-path Scenario 2 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2302702](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302702_Multi-path%20Relaying_Intel.docx) Open aspects of multi-path relaying Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2302904](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302904_Discussion_on_multipath%20relays.docx) Discussion on Multipath Relays Ericsson España S.A. discussion Rel-18

[R2-2302973](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302973_Discussion%20on%20Multi-path%20Relaying.docx) Discussion on Multi-path Relaying NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303007](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303007%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

[R2-2303013](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303013%20Discussions%20on%20Multi-path.doc) Discussions on multi-path Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303090](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303090.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303116](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303116.docx) Discussion on multi-path Xiaomi discussion

[R2-2303208](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303208%20Remaining%20issues%20on%20multipath%20SL%20relay.docx) Remaining issues on multipath SL relay Nokia, Nokia Shanghai Bell discussion

[R2-2303224](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303224%20Multi-path%20establishment%20and%20operation%20v1.0.docx) Multi-path establishment and operation Lenovo discussion Rel-18

[R2-2303390](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303390%20Discussion%20on%20control%20plan%20design%20for%20Multi-path.doc) Discussion on control plan design for Multi-path Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303391](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303391%20Discussion%20on%20remaiining%20issues%20on%20Scenario%202%20for%20Multi-path.doc) Discussion on remaining issues on Scenario 2 for Multi-path Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303487](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303487%20Discussion%20on%20multi-path%20operation.docx) Discussion on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303508](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303508-Open%20issues%20on%20multi-path%20relay%20for%20Scenario%201%20and%20Scenario%202.docx) Open issues on multi-path relay for Scenario 1 and Scenario 2 Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2303547](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303547%20Discussion%20on%20multi-path%20scenario%201.docx) Discussion on multi-path scenario 1 CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303548](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303548%20Considerations%20on%20multi-path%20scenario%202.docx) Considerations on multi-path scenario 2 CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2303565](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303565%20Discussion%20on%20multi-path%20relaying.doc) Discussion on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2303610](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303610%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

[R2-2303647](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303647_multipath_relay.docx) Considerations for multipath relay operations for Scenario 1 Kyocera discussion

[R2-2303655](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303655%20Discussion%20on%20Multi-path%20relaying.docx) Discussion on Multi-path relaying Lenovo discussion NR\_SL\_relay\_enh-Core

[R2-2303659](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303659_Discussion%20on%20Sidelink%20Relay%20multi-path%20control%20plane%20procedure%20for%20Scenario%201.docx) Discussion on Sidelink Relay multi-path control plane procedure for Scenario 1 Philips International B.V. discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303738](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303738_SL-MP-Relaying_Throughput.docx) Discussion on Throughput Enhancements in Sidelink Multiplath Relaying Fraunhofer IIS, Fraunhofer HHI discussion Rel-18

[R2-2303859](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303859%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

[R2-2303868](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303868_SLRelay_S1&2_v2.doc) Discussion sidelink relay enhancement for scenario 1&2 Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2303936](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303936%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

[R2-2304076](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304076-MP_Cplane.doc) C-plane aspects of multi-path Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304077](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304077-MP_scenario2.doc) remaining issue for supporting senario2 Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2304122](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304122%20Discussion%20on%20Multipath%20v01.docx) Discussion on Multipath MediaTek Inc. discussion Rel-18

### 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.

[R2-2303488](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303488%20Discussion%20on%20sidelink%20DRX%20for%20L2%20U2N%20relay.doc) Discussion on sidelink DRX for L2 U2N relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: No additional signalling is needed between gNB and L2 U2N relay UE in mode 2 for R18 DRX enhancement.

Proposal 2: To reduce the access delay caused by SL DRX, remote UE should disable SL DRX after sending the first RRC message during RRC setup/RRC resume procedure and relay UE should disable SL DRX after receiving the first message on SL-RLC0/SL-RLC1.

Discussion:

Qualcomm agree with P1, but they would like to clarify the remote and relay UE behaviour; they think the relay UE may need more QoS information than just the PDB.

Xiaomi agree with P1; on P2, they think it is agreeable by analogy with the existing SL DRX requirements.

OPPO are also fine with P1, but they think the current SL DRX mechanism already indicates that before the SL DRX is configured, the UE can always stay active, so they see that the requirement for P2 is already there in the current mechanism.

Xiaomi understand that access can occur after SL DRX is configured.

Agreement:

No additional signalling is needed between gNB and L2 U2N relay UE in mode 2 for R18 DRX enhancement. FFS if additional behaviour is needed for remote and/or relay UE.

[R2-2302644](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302644%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

[R2-2303118](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303118.docx) Discussion on SL DRX in U2N relay Xiaomi discussion

[R2-2303509](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303509-SL%20DRX%20for%20L2%20U2N%20relay.docx) SL DRX for L2 U2N relay Qualcomm Incorporated discussion 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 LS

[R2-2302413](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302413_R1-2302201.docx) LS on 1-symbol PRS (R1-2302201; contact: ZTE) RAN1 LS in Rel-18 TEI18 To:RAN2, RAN3 Cc:RAN4

CRs

[R2-2303498](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303498%20Correction%20on%201-symbol%20PRS%20in%2038.331.docx) Correction on 1-symbol PRS in 38.331 ZTE Corporation CR Rel-18 38.331 17.4.0 4014 - B NR\_pos\_enh2, TEI18

* Postponed

[R2-2303499](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303499%20Correction%20on%201-symbol%20PRS%20in%2037.355.docx) Correction on 1-symbol PRS in 37.355 ZTE Corporation CR Rel-18 37.355 17.4.0 0437 - B TEI18, NR\_pos\_enh2

* Agreed in principle

Discussion:

ZTE indicate that the reply LS is needed because what is introduced by the CRs includes a resource symbol offset, and RAN1 should be informed.

Lenovo have no objection to the feature, but they think we need to decide on whether UE support is mandatory or optional. On the RRC CR, they are not clear on whether it is necessary.

Ericsson have the same concern as Lenovo; they support the feature but wonder if we need to duplicate PRS functionality between LPP and RRC.

Huawei and Intel agree with Lenovo. Huawei understand that the feature is to reduce latency, and we need to understand if it is also applicable for URLLC; they cannot agree the RRC CR now, but the LPP CR is OK.

ZTE understand that the RAN1 change was for TEI18, not positioning, but they think we could check with RAN1 whether a corresponding change to PDC is needed.

Lenovo think capability is also needed in the LPP CR.

ZTE think RAN2 should not wait and we can agree the LPP CR in principle, then add the capability when the RAN1 feature list reflects it.

Qualcomm indicate that the RAN1 LS includes restrictions on the size of the search window, which could affect the LPP changes. They are OK with this way forward generally.

Agreements:

RAN2 will introduce 1-symbol PRS in line with the RAN1 agreement.

Reply LS to RAN1 to ask if a PDC change is also needed.

LPP CR is AIP; other CRs to be seen next meeting, evolved from the CRs at this meeting.

Restrictions to the search window can be considered next meeting in LPP.

Capability to be aligned with RAN1 feature list.

* [Post121bis-e][401][POS] Reply LS to RAN1 on 1-symbol PRS (ZTE)

Scope: Draft an LS to RAN1 indicating the RAN2 agreements on 1-symbol PRS and inquiring if a corresponding PDC change is needed.

Intended outcome: Agreed LS

Deadline: Short

Draft reply LS

[R2-2303500](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303500%20%5bdraft%5d%20Reply%20LS%20on%201-symbol%20PRS.docx) [Draft] Reply LS on 1-symbol PRS ZTE Corporation LS out Rel-18 TEI18, NR\_pos\_enh2 To:RAN1 Cc:RAN3

### 7.24.2 TEI proposals by RAN2

Items initiated in RAN2.

Tdoc limitation: 1 tdoc for non-previously-agreed TEI proposals.

Proposals previously submitted (to be handled initially by email)

Emergency service with relays

[R2-2302648](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2302648%20-%20Discussion%20on%20emergency%20service%20for%20SL%20Relay.docx) Discussion on emergency service for SL Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core, TEI18

* [AT121bis-e][415][Relay] Emergency service for relays (OPPO)

Scope: Discuss the proposals in R2-2302648 and attempt to develop a CR if the proposals are agreeable in principle. Also check if there is a need to align with SA2 on relay setting of the cause code for emergency service.

Intended outcome: Report in R2-2304290 and agreeable CR

Deadline: Monday 2023-04-24 2359 UTC

[R2-2304290](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304290%20-%20%5bAT121bis-e%5d%5b415%5d%5bRelay%5d%20Emergency%20service%20for%20relays%20(OPPO).doc) [AT121bis-e][415][Relay] Emergency service for relays (OPPO) OPPO discussion Rel-18 TEI18

Proposal 1 [16/17] R2 assume no additional R2 impact for gNB to know the initiated service-type of remote UE, and to select proper relay UE serving the initiated service-type of remote UE, without consideration / optimization of remote UE doing both emergency and non-emergency simultaneously (when it happens, R2 assume UE would tear down one service-type by using NAS release request).

Proposal 2 [12/14] R2 confirm R18 relay UE sets cause value for emergence service relaying as in Rel-17 for SL-RLC0 traffic. For SL-RLC1, R2 discuss whether it 1) also follows Rel-17 spec (i.e., for SL-RLC1, relay UE would not set cause value as emergency), or 2) firstly ask S2 whether there is a requirement to set cause value as emergency for path-switch case before R2 decision.

Discussion:

LG think P1 assumes the upper layer will not assign the same ID for emergency and non-emergency service, and in this case, they are not sure what the meaning of the parenthetical is.

ZTE are fine with P1, but on P2 they wonder if RAN2 should ask SA2 anything, since they see it as RAN2 business.

Huawei agree with the first part of P1, but they do not see a connection to the second part about supporting both service types. They think we need a more complete picture from SA2, and on P2 we could also ask about their requirement.

Qualcomm think we do not need an LS from P1, because they understand SA2 have no requirement for simultaneous services; they think it could be discussed directly in SA2 if there is a concern. For P2, they think it makes sense for the relay to set the emergency cause value for SL-RLC1, but they are OK to ask SA2 to confirm.

LG agree with the first part of P2, but on the second part, since path switching is controlled by gNB, they do not see the connection to setting the cause value and see no need to send an LS.

Xiaomi agree that only the first part of P1 is needed. For P2, they think the question is whether the path switch case is required, and they think SA2 have not specifically identified this case, so we could ask for clarification.

OPPO would like to send an LS to SA2 on P2.

Ericsson think we could confirm no impact on RAN2 for switching between emergency and non-emergency; they do not think we should send an LS to SA2 on P2.

Intel and CATT think we should send an LS for P2.

Nokia agree with Ericsson that no LS is needed.

Huawei wonder what the solution is for switching between emergency and non-emergency services; they are not sure if it is SA2’s intention to do it entirely in upper layers. Ericsson understand that the UE will release the current PDU session and initiate a new PDU session establishment.

NEC think internal coordination may help.

vivo think we should send the LS because SA2 are going to close their WI, and they see no strong reason not to send it.

T-Mobile agree with Ericsson about the interaction between services.

Agreements:

R2 assume no additional R2 impact for gNB to know the initiated service-type of remote UE, and to select proper relay UE serving the initiated service-type of remote UE.

R2 confirm R18 relay UE sets cause value for emergency service relaying as in Rel-17 for SL-RLC0 traffic. FFS SL-RLC1 case for path switching.

Proposal 3 [?/14] R2 sends LS to S2 to notify the conclusions above or not.

Yaw and APC (handled in email discussion [AT121bis-e][408]

[R2-2303033](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303033%20-%20Updated%20proposal%20on%20Yaw%20and%20APC.docx) Updated proposal on Yaw and APC extensions Swift Navigation discussion Rel-18

* Noted (email discussion [AT121bis-e])[408])

GNSS LOS/NLOS assistance information

[R2-2303163](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303163.docx) GNSS LOS/NLOS assistance information-Follow up Vodafone, Spirent, Ericsson, Telecom Italia discussion Rel-18

[R2-2303196](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303196.docx) GNSS LOS/NLOS assistance information Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 37.355 17.4.0 0436 - B TEI18

[R2-2303200](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303200.docx) GNSS LOS/NLOS posSIB broadcast assistance information Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 38.331 17.4.0 3998 - B TEI18

[R2-2303206](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303206.docx) GNSS LOS/NLOS posSIB broadcast assistance information Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 36.331 17.4.0 4923 - B TEI18

* [AT121bis-e][412][POS] GNSS LOS/NLOS information (Vodafone)

Scope: Discuss documents R2-2303163 / R2-2303196 / R2-2303200 / R2-2303206 and attempt to bring the CRs to an agreeable condition.

Intended outcome: Report in R2-2304287 and agreeable CRs

Deadline: Friday 2023-04-21 1000 UTC

[R2-2304287](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304287.docx) [AT121bis-e][412][POS] GNSS LOS/NLOS information Vodafone discussion Rel-18 TEI18

Proposal 1: As no other general questions (except of 1 which was clarified) were received, it is proposed to discuss all other detailed technical aspects within Stage 3 discussion.

Proposal 2: It is a moderator understanding that companies participated in the email discussion are fine to introduce LOS/NLOS feature to Rel.18 and therefore it is proposed to proceed with stage 3 details to support LOS/NLOS information based on R2-2303196, R2-2303200, R2-2303206

Proposal 3: Following comments based on R2-2303196 (LLP CR). It is proposed to have 2 weeks email discussion addressing questions raised by Qualcomm and OPPO and focusing on the grid representation questions as highlighted by E///:

1. The reference point latitude and longitude representation

2. Supported grid step lengths in meters

3. Number of possible vertical layers

4. Reference for the reference altitude

Proposal 4: It is proposed to update R2-2303200 considering the proposed changes and will be presented during the next RAN2 meeting

Proposal 5: It is proposed to update R2-2303206 considering the proposed changes and will be presented during the next RAN2 meeting

Discussion:

Vodafone understand that companies are willing to proceed and focus on stage 3 details, but they would like more offline time on the LPP CR (P3).

Nokia wonder if we can capture the CRs as baselines.

Agreement:

RAN2 intend to introduce GNSS LOS/NLOS assistance data. CRs to be seen next meeting, evolved from the CRs submitted to this meeting.

Positioning of remote UEs

[R2-2303559](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303559.docx) Positioning of remote UEs MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo discussion Rel-18 TEI18

[R2-2303702](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303702%20RelPos.docx) Relay based Positioning for emergency calls and posSIB forwarding Ericsson discussion Rel-18

* [AT121bis-e][413][POS] Positioning for remote UEs (CATT)

Scope: Discuss the proposals/TPs in R2-2303559 and R2-2303702 and attempt to converge to agreeable CRs.

Intended outcome: Report in R2-2304288 and agreeable CRs

Deadline: Friday 2023-04-21 1000 UTC

[R2-2304288](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304288%20Report%20%5bOffline-413%5d%5bPOS%5d%20Positioning%20for%20remote%20UEs%20(CATT).docx) [AT121bis-e][413][POS] Positioning for remote UEs (CATT) CATT discussion Rel-18 TEI18

[Chair’s note: See the document for details of corrections alluded to in the proposals.]

Proposal 2: RAN2 to agree the TP to TS 38.305 for positioning for remote UEs in R2-2304318.

Proposal 3: RAN2 to agree the TP to TS 37.355 for positioning for remote UEs in R2-2304319.

Proposal 4: RAN2 to agree the TP to TS 38.331 for positioning for remote UEs in R2-2304320, adding the UE capabilities in steps and one editorial correction.

Proposal 4-1: RAN2 to agree gnss-id and sbas-id should be included in SL-PosSIB-ReqInfo-r18.

Proposal 5: RAN2 to agree the TP on sfn-DFN-OffsetSupported-r18 to TS 38.306 for positioning for remote UEs in R2-2304454.

And further discuss whether “obtaining” posSIBs is needed in the description of posSIB-ForwardingSupported-r18 or not.

Discussion:

CATT understand that P2/P3 are agreeable, but P4/P5 may need some discussion. They indicate there were some recent comments to P4 and it is uncertain if the TP is acceptable.

Ericsson would like more discussion on posSIB forwarding in P4; they understand that the posSIBs are scoped to a certain geographical area and there should be some network/UE cooperation.

Ericsson think in P3, the remote UE indicator should go to the AMF instead of LMF to support LMF selection, and if SA2 were to do this, a RAN2 solution would be redundant.

Xiaomi think the RRC CR in P4 needs some discussion of whether a relay UE shall check its own SFN-DFN offset capability.

Agreements:

CR in R2-2304318 is agreeable.

WA: Remote UE indication is introduced in LPP.

SFN-DFN offset is introduced into RRC.

posSIB forwarding is introduced into RRC; FFS how much control from network side over which posSIBs can be forwarded.

CRs on 37.355, 38.331, and 38.306 to be confirmed next meeting, based on the CRs submitted to this meeting.

Proposal 1: RAN2 to further discuss the possible need to indicate the reception time of a posSIB in the DFN timeline to the remote UE, in order to solve the delay issue.

[R2-2304318](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304318_38305_CR0134_(Rel-18).DOCX) Positioning restrictions for UE-to-network remote UE [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo CR Rel-18 38.305 17.4.0 0134 - C TEI18

* Agreed in principle

[R2-2304319](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304319_37355_CR0444_(Rel-18).DOCX) Support positioning of L2 UE-to-network remote UEs [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo CR Rel-18 37.355 17.4.0 0444 - C TEI18

* Postponed

[R2-2304320](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304320_38331_CR4066_(Rel-18).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 CR Rel-18 38.331 17.4.0 4066 - C TEI18

* Postponed

[R2-2304454](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304454_38306_CR0907_(Rel-18).docx) Capabilities of L2 UE-to-network relay UEs for positioning [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo CR Rel-18 38.306 17.4.0 0907 - C TEI18

* Postponed

Local cartesian coordinates

[R2-2303698](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303698_(local%20coordinates).docx) Support of Local Cartesian Coordinates in LPP Qualcomm Incorporated discussion

* [AT121bis-e][414][POS] Local cartesian coordinates (Qualcomm)

Scope: Discuss the proposals/TP in R2-2303698 and attempt to converge to an agreeable CR.

Intended outcome: Report in R2-2304289 and agreeable CR

Deadline: Friday 2023-04-21 1000 UTC

[R2-2304289](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304289_%5bAT121bis-e%5d%5b414%5d%5bPOS%5d%20Local%20cartesian%20coordinates_v13_Summary.docx) Summary of [AT121bis-e][414][POS] Local Cartesian Coordinates Qualcomm Incorporated discussion Rel-18 TEI18

Proposal: Make the following 'Working Assumption':

Support for local Cartesian coordinates for DL-TDOA and DL-AoD positioning is also added to LPP.

Discussion:

Qualcomm understand that we would just be supporting in LPP what is already supported in other specs, but there were concerns raised, so they think we could take a WA and confirm next meeting.

ZTE and Samsung are OK with a WA.

Ericsson think it would be good to have operator views on the need for local coordinates; they understand from RAN3 side that the global coordinates will always be available, and they want to understand the source of the requirement for local coordinates.

Xiaomi felt in the discussion that this was not needed, but after some consideration they can accept it.

Huawei think the statement that global coordinates for a TRP are always available does not hold; in their understanding, the local coordinates were introduced in Rel-17 for cases where the global coordinates cannot be properly surveyed (e.g., underground or in a shopping mall). They are OK with a WA.

OPPO are not clear on the intention; they think the use case should be clarified by RAN3. They can accept majority view.

Lenovo are OK with a WA.

Agreement:

WA: Support for local Cartesian coordinates for DL-TDOA and DL-AoD positioning is added to LPP.

New proposals: positioning

[R2-2303123](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303123.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) to remote UE.

Proposal 2: The reception time of the posSIB(s) 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:

Xiaomi would like to clarify that the forwarding delay can range from ms to s, delaying posSIB reception. They understand that the specs provide a maximum 3 s window.

Qualcomm think if the delay can be up to 10 s, an SFN timestamp would need to be disambiguated. They also wonder if something is needed for other SIBs.

ZTE understand that most companies are OK to further discuss the need, but we could postpone now.

Ericsson think the issue will not prevent posSIB reception or cause call drops; they would like to understand the consequences better.

Nokia wonder how having the timestamp will reduce the delay and what action the remote UE can take.

[R2-2304007](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2304007%20(7.24.2)%20multiple%20QoS%20handling%20in%20POS%20for%20latency%20reduction.docx) Introduction of multiple QoS in positioning for latency reduction Samsung R&D Institute UK discussion

* Noted

Proposal 1. Introduce multiple QoS level information (i.e., accuracy values) to LPP location information request procedure when LMF receives the service request with multipleQoS class from LCS client.

Proposal 2. If UE receives LPP Request Location Information including multiple QoS information, UE should evaluate whether the measured result/location estimate fulfils the accompanied accuracy requirement sequentially in the order of preference level.

Proposal 3. Once there is a preference level of accuracy on which the measured result/ location estimate fulfils the accuracy requirement, UE should report that result/location estimate with the indication of fulfilled accuracy requirement.

Discussion:

Huawei think this was previously discussed and is supported in SA2. They are fine with the idea but want to clarify if it only applies to UE-based positioning; in P2, they are not clear why the UE would evaluate the measurement results. For UE-assisted, they see no LPP impact.

CATT understand SA2 agreed multiple QoS for the LCS client, but they decided that there would be multiple LPP sessions, so they see no RAN2 impact.

Intel tend to agree with CATT, and if there is support for multiple QoS in the same LPP session, they understand that the UE can still send a response even if it does not meet the QoS requirement, so they do not see what the UE impact would be to support it.

Qualcomm understood this is a network feature; they think if the first QoS is not met, the LMF will try a second time, e.g., with a different positioning method. They are not sure what the UE can do if the first QoS is not met.

Ericsson understand the objective is that the UE would indicate what QoS it was able to meet, and this would save latency over having multiple sessions. They would like to see a draft CR. Huawei have the same view.

Samsung indicate that the intention is as Ericsson said, and if the first QoS value is not met, the LMF should not have to introduce a new session, which would have latency costs. On CATT’s comment, they think there would be signalling overhead even if the sessions are in parallel.

New proposals: relays

[R2-2303746](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202304%20-%20RAN2_121bis-e,%20Online\Extracts\R2-2303746%20U2N%20Relay%20UE%20operation%20Threshold%20Conditions%20-%20Impact%20of%20UE%20Mobility%20-%20R2%23121bis-e.doc) U2N Relay UE operation Threshold Conditions: Impact of UE Mobility Philips International B.V., FirstNet, ASUSTek, NEC, MediaTek, Lenovo discussion Rel-18 NR\_SL\_relay\_enh R2-2212276

* Noted

Proposal 1: The mobility of the U2N Relay UE should be taken into account in the RSRP thresholds that determine whether the U2N Relay UE can send relay discovery messages.

Proposal 2: The parameters hystMinRelay / hystMaxRelay, used in U2N Relay UE operation threshold conditions, can be adapted to consider the mobility state of the U2N Relay UE by using a scaling factor (similar to q-hystSF in NR). How to design the scaling factor is FFS

Discussion:

Ericsson think this is a bit like idle-mode mobility state estimation; they see it as not a very accurate mechanism and would rather leave it to relay UE implementation.

Qualcomm do not think the proposal would work for all cases, e.g., two UEs in high mobility might be moving together and discovery would still be useful, so they think we should consider the link conditions.

Apple think if the relay is in high mobility, it should be up to the network to decide what it does, and we should look at a wider space of possible solutions.

ZTE have the same view as Qualcomm; the relay and remote may move together, and what matters is the relative mobility between them. They think the gNB implementation should select a suitable relay UE considering mobility.

vivo agree with Ericsson and do not see the use case for a fast-moving relay unless it is collocated with the remote. They think this case could be considered in Rel-19.

Huawei have a similar view that if a solution is needed, it could be different from these proposals.

Philips agree this solution is somewhat for limited cases, but it is a straightforward solution for these cases with low spec impact.

# Annex A: At-Meeting Email Discussions

* [AT121bis-e][400][POS][Relay] Organisational Nathan – Positioning/Relay (MediaTek)

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

Intended outcome: Well-informed participants

Deadline: Wednesday 2023-04-26 1000 UTC

* [AT121bis-e][407][POS] LTE positioning corrections (CATT)

Scope: Check the CRs in agenda item 4.4: R2-2302625 / R2-2302626 / R2-2302627 / R2-2302628 / R2-2302629 / R2-2302630 / R2-2302631 / R2-2302632 / R2-2302633 / R2-2302634 / R2-2302635 / R2-2302636.

Intended outcome: Report in R2-2304282 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][408][POS] Yaw and APC (Swift)

Scope: Check the proposals in R2-2303030 and R2-2303658, merge if necessary, and conclude on the needed changes. Also progress the related discussion from the TEI18 proposal in R2-2303033 and attempt to converge to agreeable CRs

Intended outcome: Report in R2-2304283, agreed Rel-16/17 CRs (without CB if possible), agreeable Rel-18 CRs

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][409][POS] LS to RTCM (Ericsson)

Scope: Review the draft LS in R2-2304044 in light of the email discussion report in R2-2304045 and develop an approvable version.

Intended outcome: Report in R2-2304284 and approved LS (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][410][POS] Rel-15/16 positioning stage 3 CRs (ZTE)

Scope: Check the CRs from agenda items 5.3.2, 5.3.3, and 5.3.4: R2-2302985 / R2-2302986 / R2-2302989 / R2-2302990 / R2-2304046 / R2-2304047 / R2-2304048 / R2-2303501 / R2-2303502.

Intended outcome: Report in R2-2304285 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][411][POS] Rel-17 positioning stage 2 CRs (Nokia)

Scope: Check the CRs from agenda item 6.7.1: R2-2302637 / R2-2302744 / R2-2302993 / R2-2304052 / R2-2304053 / R2-2304054.

Intended outcome: Report in R2-2304286 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][412][POS] GNSS LOS/NLOS information (Vodafone)

Scope: Discuss documents R2-2303163 / R2-2303196 / R2-2303200 / R2-2303206 and attempt to bring the CRs to an agreeable condition.

Intended outcome: Report in R2-2304287 and agreeable CRs

Deadline: Friday 2023-04-21 1000 UTC

* [AT121bis-e][413][POS] Positioning for remote UEs (CATT)

Scope: Discuss the proposals/TPs in R2-2303559 and R2-2303702 and attempt to converge to agreeable CRs.

Intended outcome: Report in R2-2304288 and agreeable CRs

Deadline: Friday 2023-04-21 1000 UTC

* [AT121bis-e][414][POS] Local cartesian coordinates (Qualcomm)

Scope: Discuss the proposals/TP in R2-2303698 and attempt to converge to an agreeable CR.

Intended outcome: Report in R2-2304289 and agreeable CR

Deadline: Friday 2023-04-21 1000 UTC

* [AT121bis-e][415][Relay] Emergency service for relays (OPPO)

Scope: Discuss the proposals in R2-2302648 and attempt to develop a CR if the proposals are agreeable in principle. Also check if there is a need to align with SA2 on relay setting of the cause code for emergency service.

Intended outcome: Report in R2-2304290 and agreeable CR

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][416][Relay] Paging monitoring by L2 relay (OPPO)

Scope: Discuss R2-2302576 and conclude on the proposals.

Intended outcome: Report to CB session in R2-2304291

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][417][POS] LS on GNSS integrity parameters (Huawei)

Scope: Consider the LS in R2-2302404 and draft a reply.

Intended outcome: Report in R2-2304292 and approvable LS in R2-2304307

Deadline: Friday 2023-04-21 1000 UTC

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

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

Intended outcome: Report to CB session in R2-2304293 and endorseable CR baseline

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][419][Relay] Remaining high-priority proposals on multi-path (LG)

Scope: Discuss the remaining HP proposals from R2-2303857.

Intended outcome: Report to CB session in R2-2304294

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][420][Relay] LS to SA2 on authorisation for scenario 2 (vivo)

Scope: Draft an LS to SA2 for the concern with support of multi-path transmission authorization and subscription function for a UE acting as the remote or relay UE in Scenario-2, calling their attention to the possible spec divergence. RAN2 background can be provided to the extent needed for the issue to be clear. Expected action is “take into account”.

Intended outcome: Approved LS (without CB if possible) in R2-2304458

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][421][POS] Reply LS to SA2 on PRU procedures (Qualcomm)

Scope: Draft a reply to R2-2302449, taking related contributions into account.

Intended outcome: Report in R2-2304295 and approved LS (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][422][POS] SLPP specification baseline (Intel)

Scope: Collect comments on R2-2302738 and R2-2302739 and attempt to converge to a baseline, taking into account also related contributions on SLPP structure.

Intended outcome: Report in R2-2304296 and endorseable skeleton in R2-2304306

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][423][POS] Sidelink positioning parameters in discovery signalling (Nokia)

Scope: Discuss the necessary parameters in discovery signalling for identifying the involved UEs in a sidelink positioning operation and establishing a session.

Intended outcome: Report to Monday week 2 session in R2-2304297

Deadline: Friday 2023-04-21 1000 UTC

* [AT121bis-e][424][POS] Group positioning and multiple targets (Xiaomi/Qualcomm)

Scope: Discuss P17-P19 of R2-2302740, attempt to conclude, and evaluate whether we can reply to the SA2 LS on multiple target UEs.

Intended outcome: Report in R2-2304298 (Xiaomi) and agreeable reply LS (Qualcomm)

Deadline: Friday 2023-04-21 1000 UTC

* [AT121bis-e][425][Relay] Rel-17 relay CP CRs (Huawei)

Scope: Check the proposals from R2-2304189 and conclude on the CRs. Can produce a merged CR for minor changes.

Intended outcome: Report to CB session in R2-2304299 and agreeable CRs

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][426][Relay] Rel-17 relay UP CR (Samsung)

Scope: Check the CR in R2-2304036 and determine whether/how to integrate the TP from P4 of R2-2304191

Intended outcome: Report in R2-2304479 and agreed CR (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][427][POS] Rel-17 LPP CRs (Qualcomm)

Scope: Check the CRs in agenda item 6.7.3 and R2-2302745.

Intended outcome: Report in R2-2304300 and agreed CRs (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][428][POS] Sidelink positioning stage 2 (CATT)

Scope:

* Discuss the proposals for an architecture figure at stage 2 level and attempt to converge.
* Discuss the proposals for SLPP signalling procedures between UEs and attempt to reach agreement on a basic set of procedures.

Intended outcome: Report to CB session in R2-2304301

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][429][POS] Session-based SLPP (Samsung)

Scope: Discuss the proposals from section 2.1 of R2-2304005 and progress towards agreements.

Intended outcome: Report to CB session in R2-2304302

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][430][Relay] Multi-path relay idle/inactive cases (InterDigital)

Scope: Discuss and attempt to converge on the candidate agreements from the multi-path discussion:

Multi-path at the remote UE is not maintained when the relay UE is moved to RRC\_IDLE/RRC\_INACTIVE in this release.

A remote UE in multipath that is released to RRC\_IDLE/RRC\_INACTIVE can apply legacy cell/relay selection behaviour, thus moving to single-path operation on either path according to implementation.

Intended outcome: Report to CB session in R2-2304303

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][431][Relay] SRAP proposals on U2U relay (Lenovo)

Scope: Discuss the SRAP proposals (P18a to P23) for discussion from R2-2304194 and converge where possible.

Intended outcome: Report to CB session in R2-2304304

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][432][Relay] Candidate solutions for lossless delivery (NEC)

Scope: Evaluate candidate solutions for lossless delivery (DL/UL) in U2N service continuity. Intention is to capture solutions for down-selection next meeting.

Intended outcome: Report to CB session in R2-2304305

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][433][POS] LS to RAN1 on RAT-dependent integrity (OPPO)

Scope: Inform RAN1 of RAN2 decisions on RAT-dependent integrity and solicit their input as indicated in the agreements.

Intended outcome: Approved LS (without CB if possible)

Deadline: Monday 2023-04-24 2359 UTC

* [AT121bis-e][434][POS] Reply LS to SA2 on low power or high accuracy positioning (Huawei)

Scope: Draft a reply LS to SA2 indicating that “low power or high accuracy” is out of the WI scope.

Intended outcome: Approved LS (without CB if possible)

Deadline: Tuesday 2023-04-25 1800 UTC

# Annex B: Post-Meeting Email Discussions

* [Post121bis-e][401][POS] Reply LS to RAN1 on 1-symbol PRS (ZTE)

Scope: Draft an LS to RAN1 indicating the RAN2 agreements on 1-symbol PRS and inquiring if a corresponding PDC change is needed.

Intended outcome: Agreed LS

Deadline: Short

* [Post121bis-e][402][Relay] LS to SA3 on configuration index of U2U relay bearers for security (Lenovo)

Scope: Draft an LS to SA3 to confirm the feasibility of using the configuration index as an input to security.

Intended outcome: Approved LS in R2-2304559

Deadline: Short