3GPP TSG-RAN WG2 Meeting #120 R2-22xxxxx

Toulouse, France, November, 2022

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# 4 EUTRA Rel-16 and earlier

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

## 4.3 Positioning corrections Rel-16 and earlier

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

Documents in this agenda item will be handled by email. No web conference is planned for this agenda item.

# 5 NR Rel-15 and Rel-16

Essential corrections only.

Tdoc Limitation: 10 tdocs in total for all sub agenda items.

## 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)

### 5.3.1 General and Stage 2 corrections

Including incoming LSs, 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.

Incoming LS

[R2-2211150](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211150_R1-2210618.docx) LS on DL PRS search window (R1-2210618; contact: Qualcomm) RAN1 LS in Rel-16 NR\_pos-Core To:RAN2

* Noted

AI summary

[R2-2213116](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213116_(Summary%20of%20AI%205.3.1%20(Stage%202)%20and%205.3.3%20(LPP))_v2.docx) Summary of Rel-15 and Rel-16 NR Positioning Support AIs 5.3.1 and 5.3.3 Qualcomm Incorporated discussion Rel-16 NR\_pos-Core

[DL-PRS Search Window]

Proposal 1: The CRs in

R2-2212229, Correction to DL-PRS Search Window calculation, Qualcomm Incorporated, CR Rel-16 37.355 16.8.0 0391 - F NR\_pos-Core

R2-2212231, Correction to DL-PRS Search Window calculation, Qualcomm Incorporated, CR Rel-17 37.355 17.2.0 0392 – A NR\_pos-Core

are essential corrections.

Agreements:

Proposal 1: The CRs in

R2-2212229, Correction to DL-PRS Search Window calculation, Qualcomm Incorporated, CR Rel-16 37.355 16.8.0 0391 - F NR\_pos-Core

R2-2212231, Correction to DL-PRS Search Window calculation, Qualcomm Incorporated, CR Rel-17 37.355 17.2.0 0392 – A NR\_pos-Core

[DL-PRS Capability]

Proposal 2: The CRs in

R2-2211420, Corrections of LPP capabilities on DL-RPS, CATT, CR Rel-16 37.355 16.8.0 0388 - F NR\_pos-Core

R2-2211421, Corrections of LPP capabilities on DL-RPS, CATT, CR Rel-17 37.355 17.2.0 0389 - A NR\_pos-Core

are essential corrections. Update the inter-operability statement on the Cover Sheet.

Agreement:

Proposal 2: The CRs in

R2-2211420, Corrections of LPP capabilities on DL-RPS, CATT, CR Rel-16 37.355 16.8.0 0388 - F NR\_pos-Core

R2-2211421, Corrections of LPP capabilities on DL-RPS, CATT, CR Rel-17 37.355 17.2.0 0389 - A NR\_pos-Core

are essential corrections. Update the inter-operability statement on the Cover Sheet.

[associated-DL-PRS-ID in IE NR-DL-PRS-BeamInfo]

Proposal 3: RAN2 to discuss and decide whether the CRs inThe CRs in

R2-2212347, Correction of NR DL-PRS BeamInfo attribute associated-DL-PRS-ID field description, Ericsson, CR Rel-16 37.355 16.8.0 0393 – F NR\_pos-Core

R2-2212348, Correction of NR DL-PRS BeamInfo attribute associated-DL-PRS-ID field description, Ericsson, CR Rel-17 37.355 17.2.0 0394 – A NR\_pos-Core

are not essential corrections or not.

Discussion:

Samsung indicate the intention is agreeable and the signalling reduction cannot work well with the current field descriptions.

Qualcomm think the field description should be aligned with the Rel-17 BeamAntennaInfo.

Nokia wonder when both associatedDL-PRS-ID and lcs-GCS-TranslationParameter are present, if the behaviour is clear with the current change.

Intel would like to understand if there are impacted implementations in the field.

* [AT120][401][POS] associated-DL-PRS-ID in IE NR-DL-PRS-BeamInfo (Ericsson)

Scope: Review the CRs in R2-2212347 and R2-2212348 and update for consistency and clarity.

Intended outcome: Agreeable CRs in R2-2213132 and R2-2213133

Deadline: Wednesday 2022-11-16 1800

[Missing GNSS Types in GNSS-SSR-OrbitCorrections]

Proposal 4: The CRs in

R2-2212349, Adding missing and correcting GNSS Types in GNSS-SSR-OrbitCorrections, Ericsson, u-blox, Swift Navigation, CR Rel-16 37.355 16.8.0 0395 – F NR\_pos-Core

R2-2212350, Adding missing and correcting GNSS Types in GNSS-SSR-OrbitCorrections, Ericsson, u-blox, Swift Navigation, CR Rel-17 37.355 17.2.0 0396 – A NR\_pos-Core

are not essential corrections.

Agreement:

Proposal 4: The CRs in

R2-2212349, Adding missing and correcting GNSS Types in GNSS-SSR-OrbitCorrections, Ericsson, u-blox, Swift Navigation, CR Rel-16 37.355 16.8.0 0395 – F NR\_pos-Core

R2-2212350, Adding missing and correcting GNSS Types in GNSS-SSR-OrbitCorrections, Ericsson, u-blox, Swift Navigation, CR Rel-17 37.355 17.2.0 0396 – A NR\_pos-Core

are not essential corrections.

[Meaning of GNSS IOD SSR]

Proposal 5: RAN2 to discuss and decide whether the CRs in

R2-2212351, Clarifying the meaning of GNSS IOD SSR to avoid different interpretations, Ericsson, u-blox, Swift Navigation, CR Rel-16 37.355 16.8.0 0397 – F NR\_pos-Core

R2-2212352, Clarifying the meaning of GNSS IOD SSR to avoid different interpretations, Ericsson, u-blox, Swift Navigation, CR Rel-17 37.355 17.2.0 0398 – A NR\_pos-Core

are essential corrections or not.

Discussion:

Qualcomm do not think the change is essential; they think a NOTE in the Rel-18 spec could be considered, but for the UE to use the IOD differently would probably violate existing specs.

Ericsson think a change is needed, but it could be discussed if it should be in the field description or a NOTE; they think it is important to understand what information can be used together.

Qualcomm think the UE may receive the assistance data from different LMFs, and the IOD would only be valid within one LMF, so it is not possible to guarantee that the UE is never using assistance data with the same IOD. So they understand that this could not be a testable requirement.

Ericsson are OK with a NOTE, but they think it should be from Rel-16. Qualcomm do not see anything broken and think implementations already behave as the NOTE would indicate.

Ericsson think it would be a service to the UE to clarify how the information is intended to be used.

Agreement:

R2-2212351 and R2-2212352 are not pursued in Rel-16/17. RAN2 understand that a NOTE with a similar intention could be considered for Rel-18.

[Definition of GNSS-SSR-URA]

Proposal 6: The CRs in

R2-2212353, Correcting field description and definition of GNSS-SSR-URA, Ericsson, u-blox, Swift Navigation, CR Rel-16 37.355 16.8.0 0399 – F NR\_pos-Core

R2-2212354, Correcting field description and definition of GNSS-SSR-URA, Ericsson, u-blox, Swift Navigation, CR Rel-17 37.355 17.2.0 0400 – A NR\_pos-Core

are essential corrections. Correct the Rel-17 CR Category on the Cover Sheet.

Agreement:

R2-2212353, Correcting field description and definition of GNSS-SSR-URA, Ericsson, u-blox, Swift Navigation, CR Rel-16 37.355 16.8.0 0399 – F NR\_pos-Core

R2-2212354, Correcting field description and definition of GNSS-SSR-URA, Ericsson, u-blox, Swift Navigation, CR Rel-17 37.355 17.2.0 0400 – A NR\_pos-Core

are essential corrections. Correct the Rel-17 CR Category on the Cover Sheet.

[Satellite Yaw Angle]

Proposal 7: RAN2 to discuss and decide whether the CRs in

R2-2212516, Update Stage 2 SSR Phase Bias description to include yaw, Swift Navigation, Mitsubishi Electric Corporation, Ericsson, CR Rel-16 36.305 16.4.0 0111 – F NR\_pos-Core

R2-2212518, Update Stage 2 SSR Phase Bias description to include yaw, Swift Navigation, Mitsubishi Electric Corporation, Ericsson, CR Rel-17 36.305 17.2.0 0112 – A NR\_pos-Core

R2-2212535, Update Stage 2 SSR Phase Bias description to include yaw, Swift Navigation, Mitsubishi Electric Corporation, Ericsson, CR Rel-16 38.305 16.8.0 0113 – F NR\_pos-Core

R2-2212536, Update Stage 2 SSR Phase Bias description to include yaw, Swift Navigation, Mitsubishi Electric Corporation, Ericsson, CR Rel-17 38.305 17.2.0 0114 – A NR\_pos-Core

R2-2212507, Addition of missing yaw angle and rate in SSR Phase Bias message (TS 37.355), Swift Navigation, Mitsubishi Electric Corporation, Ericsson, CR Rel-16 37.355 16.8.0 0401 – F NR\_pos-Core

R2-2212511, Addition of missing yaw angle and rate in SSR Phase Bias message (TS 37.355),Swift Navigation, Mitsubishi Electric Corporation, Ericsson, CR Rel-17 37.355 17.2.0 0402 – A NR\_pos-Core

are essential corrections or not.

Discussion:

CATT wonder what the real status of RTCM is on these fields and when/whether they will specify them. They also see it as an enhancement rather than a correction.

Swift indicate that there is an interoperability concern; compact SSR assumes zero yaw, but not all correction providers send information for zero yaw. In this respect they see it as a correction; they understand that RTCM have identified yaw as something to be supported in principle, but there is not yet a formal agreement, and it is specified as part of the IGS standard and needed so that the UE and network are in agreement. However, Swift acknowledge the BC issue from the rapporteur’s summary, and they think a separate IE for the phase bias would be a reasonable direction, for Rel-16 or later.

Qualcomm understand that Swift’s analysis would mean the compact SSR messages do not work, which is not the case in practice. A service provider sending AD with compact SSR and nonzero yaw assumption would be an error.

Intel are OK with introducing a separate IE for the phase bias and a UE capability.

Qualcomm think there would need to be a new posSIB as well, and they have doubts about changing Rel-16 broadcast for something that is not broken.

Nokia think this looks like added functionality, which may not be justified for Rel-16; they have not considered the posSIB impacts, but in general they think this would be OK as an addition to Rel-18, with some time needed to think about the posSIBs.

Swift do not think compact SSR is broken, but it was designed for a narrow purpose and we generalised it in Rel-16 (e.g. the grid definitions), and they see this as a similar extension that should have been done at the time.

Ericsson think it would be good to be complete, and there will eventually be providers of data with yaw included. They see this as an overlooked item from Rel-16.

[Satellite Antenna Phase Centre Corrections]

Proposal 7: RAN2 to discuss and decide whether the Proposal 2 in

R2-2212544, Discussion and TP on Yaw Angle and Antenna Phase Center corrections for SSR assistance data, Swift Navigation, Mitsubishi Electric Corporation, Ericsson discussion Rel-16 NR\_pos-Core, is an essential corrections or not:

"Proposal 2: Discuss and agree to add the satellite Antenna Phase Center message in the SSR assistance data.

LS to RAN3 to agree on new posSibType2-xy for GNSS-SSR-SatelliteAPC in TS 36.455/38.455.

Agree to develop the corresponding CRs for TS 37.355, TS 36.305/38.305, TS 36.331/38.331 and TS 36.455/38.455".

* [AT120][402][POS] Yaw angle and APC (Swift)

Scope: Discuss the two proposals labelled P7 from R2-2213116, determine if a change to Rel-16 is warranted, and draft updated CRs if there is support.

Intended outcome: Agreeable CRs if possible and report in R2-2213149

Deadline: Wednesday 2022-11-16 1800

[R2-2213149](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213149%20-%20SUMMARY%20%5bAT120%5d%5b402%5d%5bPOS%5d%20Yaw%20angle%20and%20APC%20(Swift).docx) [AT120][402][POS] Yaw angle and APC (Swift) Swift Navigation discussion Rel-16 NR\_pos-Core

Proposal 1: Agree that the Network requires the ability to provide yaw parameters to the UE for the purpose of interoperability.

Proposal 2: Agree to address the yaw corrections in LPP, targeting TEI17.

Proposal 3: RAN2 to continue discussing options for how to handle the APC interoperability, including which release requires correcting if agreed (e.g. TEI17, TEI18 etc).

Yaw angle/APC

[R2-2212544](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212544%20-%20SSR%20Yaw%20and%20APC%20(Swift).docx) Discussion and TP on Yaw Angle and Antenna Phase Center corrections for SSR assistance data Swift Navigation, Mitsubishi Electric Corporation, Ericsson discussion Rel-16 NR\_pos-Core

[R2-2212516](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212516_36305_(CR0111)_R16.docx) Update Stage 2 SSR Phase Bias description to include yaw Swift Navigation, Mitsubishi Electric Corporation, Ericsson CR Rel-16 36.305 16.4.0 0111 - F NR\_pos-Core

[R2-2212518](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212518_36305_(CR0112)_R17.docx) Update Stage 2 SSR Phase Bias description to include yaw Swift Navigation, Mitsubishi Electric Corporation, Ericsson CR Rel-17 36.305 17.2.0 0112 - A NR\_pos-Core

[R2-2212535](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212535_38305_(CR0113)_R16.docx) Update Stage 2 SSR Phase Bias description to include yaw Swift Navigation, Mitsubishi Electric Corporation, Ericsson CR Rel-16 38.305 16.8.0 0113 - F NR\_pos-Core

[R2-2212536](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212536_38305_(CR0114)_R17.docx) Update Stage 2 SSR Phase Bias description to include yaw Swift Navigation, Mitsubishi Electric Corporation, Ericsson CR Rel-17 38.305 17.2.0 0114 - A NR\_pos-Core

### 5.3.2 RRC corrections

Including impact to 36.331, 38.331, and 38.306.

[R2-2211258](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211258%20Correction%20to%20on-demand%20SI%20request%20for%20posSIB.docx) Correction to on-demand SI request for posSIB Huawei, HiSilicon CR Rel-16 38.331 16.10.0 3573 - F NR\_pos-Core

Discussion:

Samsung agree in principle with the CR, but they think a minor revision is needed: si-BroadcastStatus should be modified to posSI-BroadcastStatus in one place.

vivo are generally OK, but wonder if the first condition should also be split between posSIB and normal SIB. Huawei think a condition could be added to the scheduling information list as well; they are not sure about vivo’s comment but think the two kinds of SIBs can never be included in the same message.

Lenovo agree with the intention in principle, but they think there is a simpler solution in the wording; they have submitted CRs to the main session that cover this aspect among others, and they indicate that the CRs were sent to offline discussion. So they would propose merging this discussion into offline [011] from the main session. Huawei understand that the second option was not pursued in the main session discussion; Lenovo indicate that there was a separate submission of Rel-16 CRs, and discussion [011] is directed to those (not to the Rel-17 proposal that was not pursued).

Huawei agree this could be included in the existing discussion for Rel-17 TEI17 CRs.

* [AT120][403][POS] Correction to on-demand SI request for posSIB (Huawei)

Scope: Check and update the proposal in R2-2211258, and align with related discussions from the main session on on-demand SI updates in Rel-16 and Rel-17.

Intended outcome: Agreeable CR in R2-2213150 if necessary

Deadline: Wednesday 2022-11-16 1800

R2-2213150 Correction to on-demand SI request for posSIB Huawei, HiSilicon CR Rel-16 38.331 16.10.0 3573 1 F NR\_pos-Core

### 5.3.3 LPP corrections

[R2-2211420](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\37355_CR0388_(Rel-16)_R2-2211420.docx) Corrections of LPP capabilities on DL-RPS CATT CR Rel-16 37.355 16.8.0 0388 - F NR\_pos-Core

* Update interoperability as “If a UE signals the missing values, a legacy LMF would not be able to receive the complete UE capability”
* Agreed with this update as R2-2213123

[R2-2211421](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\37355_CR0389_(Rel-17)_R2-2211421.docx) Corrections of LPP capabilities on DL-RPS CATT CR Rel-17 37.355 17.2.0 0389 - A NR\_pos-Core

* Update interoperability as “If a UE signals the missing values, a legacy LMF would not be able to receive the complete UE capability”
* Agreed with this update as R2-2213124

R2-2213123 Corrections of LPP capabilities on DL-RPS CATT CR Rel-16 37.355 16.8.0 0388 1 F NR\_pos-Core

* Agreed

R2-2213124 Corrections of LPP capabilities on DL-RPS CATT CR Rel-17 37.355 17.2.0 0389 1 A NR\_pos-Core

* Agreed

[R2-2212229](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212229_(CR%2037355_Rel16_PRS-SearchWindow).docx) Correction to DL-PRS Search Window calculation Qualcomm Incorporated CR Rel-16 37.355 16.8.0 0391 - F NR\_pos-Core

* Agreed

[R2-2212231](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212231_(CR%2037355_Rel17_PRS-SearchWindow).docx) Correction to DL-PRS Search Window calculation Qualcomm Incorporated CR Rel-17 37.355 17.2.0 0392 - A NR\_pos-Core

* Agreed

[R2-2212347](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212347%20BeamInfo.docx) Correction of NR DL-PRS BeamInfo attribute associated-DL-PRS-ID field description Ericsson CR Rel-16 37.355 16.8.0 0393 - F NR\_pos-Core

* Revised in R2-2213132

[R2-2212348](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212348%20BeamInfo.docx) Correction of NR DL-PRS BeamInfo attribute associated-DL-PRS-ID field description Ericsson CR Rel-17 37.355 17.2.0 0394 - A NR\_pos-Core

* Revised in R2-2213133

[R2-2213132](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213132.docx) Correction of NR DL-PRS BeamInfo attribute associated-DL-PRS-ID field description Ericsson CR Rel-16 37.355 16.8.0 0393 1 F NR\_pos-Core

[R2-2213133](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213133.docx) Correction of NR DL-PRS BeamInfo attribute associated-DL-PRS-ID field description Ericsson CR Rel-17 37.355 17.2.0 0394 1 A NR\_pos-Core

[R2-2212349](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212349%20Orbit.docx) Adding missing and correcting GNSS Types in GNSS-SSR-OrbitCorrections Ericsson, u-blox, Swift Navigation CR Rel-16 37.355 16.8.0 0395 - F NR\_pos-Core

* Not pursued

[R2-2212350](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212350%20Orbit.docx) Adding missing and correcting GNSS Types in GNSS-SSR-OrbitCorrections Ericsson, u-blox, Swift Navigation CR Rel-17 37.355 17.2.0 0396 - A NR\_pos-Core

* Not pursued

[R2-2212351](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212351%20IOD.docx) Clarifying the meaning of GNSS IOD SSR to avoid different interpretations Ericsson, u-blox, Swift Navigation CR Rel-16 37.355 16.8.0 0397 - F NR\_pos-Core

* Not pursued

[R2-2212352](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212352%20IOD.docx) Clarifying the meaning of GNSS IOD SSR to avoid different interpretations Ericsson, u-blox, Swift Navigation CR Rel-17 37.355 17.2.0 0398 - A NR\_pos-Core

* Not pursued

[R2-2212353](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212353%20URA.docx) Correcting field description and definition of GNSS-SSR-URA Ericsson, u-blox, Swift Navigation CR Rel-16 37.355 16.8.0 0399 - F NR\_pos-Core

* Agreed

[R2-2212354](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212354%20URA.docx) Correcting field description and definition of GNSS-SSR-URA Ericsson, u-blox, Swift Navigation CR Rel-17 37.355 17.2.0 0400 - A NR\_pos-Core

* Category on coversheet to be corrected to A
* Agreed with this update as R2-2213125

[R2-2213125](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213125.docx) Correcting field description and definition of GNSS-SSR-URA Ericsson, u-blox, Swift Navigation CR Rel-17 37.355 17.2.0 0400 1 A NR\_pos-Core

* Agreed

[R2-2212507](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212507_37355_(CR0401)_R16.docx) Addition of missing yaw angle and rate in SSR Phase Bias message (TS 37.355) Swift Navigation, Mitsubishi Electric Corporation, Ericsson CR Rel-16 37.355 16.8.0 0401 - F NR\_pos-Core

[R2-2212511](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212511_37355_(CR0402)_R17.docx) Addition of missing yaw angle and rate in SSR Phase Bias message (TS 37.355) Swift Navigation, Mitsubishi Electric Corporation, Ericsson CR Rel-17 37.355 17.2.0 0402 - A NR\_pos-Core

### 5.3.4 MAC corrections

# 6 NR Rel-17

## 6.7 NR Sidelink relay

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

Tdoc Limitation: 3 tdocs

### 6.7.0 In-principle agreed CRs

CRs AIP from RAN2#119bis-e.

[R2-2211211](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38351_CR0012r1_(Rel-17)_R2-2211211%20-%20Correction%20for%20L2%20U2N%20Relay.docx) Correction for L2 U2N Relay OPPO CR Rel-17 38.351 17.2.0 0012 1 F NR\_SL\_relay-Core R2-2210972

* [AT120][411][Relay] Rel-17 SRAP CR (OPPO)

Scope: Update the CR in R2-2211211 with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2213129

Deadline: Wednesday 2022-11-16 1800

[R2-2213129](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38351_CR0012r2_(Rel-17)_R2-2213129%20-%20Correction%20for%20L2%20U2N%20Relay.docx) Correction for L2 U2N Relay OPPO CR Rel-17 38.351 17.2.0 0012 2 F NR\_SL\_relay-Core R2-2210972

[R2-2211747](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3549r2_(Rel-17)_R2-2211747_Misc%20RRC%20CR%20for%20SL%20relay.docx) Misc RRC CR for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3549 2 F NR\_SL\_relay-Core R2-2210902

The following email discussion was duplicated by mistake from [409] and will not be used.

* [AT120][412][Relay] Rel-17 relay RRC CR (Huawei)

Scope: Update the CR in R2-2211747 with decisions of this meeting.

Intended outcome: Agreeable CR

Deadline: Thursday 2022-11-17 1800

[R2-2212202](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38322_R2-2212202_CR0050_Correction%20on%20RLC%20for%20SL%20relay.docx) RLC correction for SL relay Samsung CR Rel-17 38.322 17.1.0 0050 1 F NR\_SL\_relay-Core R2-2210915

* [AT120][413][Relay] Rel-17 relay RLC CR (Samsung)

Scope: Update the CR in R2-2212202 with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2212987

Deadline: Thursday 2022-11-17 1800

R2-2212987 RLC correction for SL relay Samsung CR Rel-17 38.322 17.1.0 0050 2 F NR\_SL\_relay-Core R2-2210915

[R2-2212203](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38323_R2-2212203_CR0104_Correction%20on%20PDCP%20for%20SL%20relay.docx) PDCP correction for SL relay Samsung CR Rel-17 38.323 17.2.0 0104 1 F NR\_SL\_relay-Core R2-2210916

Discussion:

Huawei think there may be impact to PDCP from the cast type discussion.

* [AT120][414][Relay] Rel-17 relay PDCP CR (Samsung)

Scope: Update the CR in R2-2212203 with decisions of this meeting if necessary.

Intended outcome: Agreeable CR

Deadline: Thursday 2022-11-17 1800

[R2-2212433](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38.304_CR0288(Rel-17)_R2-2212433-%20Correction%20on%2038.304%20for%20SL%20relay.docx) Correction on 38.304 for SL relay Ericsson, Nokia, Nokia Shanghai Bell CR Rel-17 38.304 17.2.0 0288 2 F NR\_SL\_relay-Core R2-2210970

* [AT120][415][Relay] Rel-17 relay 38.304 CR (Ericsson)

Scope: Update the CR in R2-2212433 with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2212986

Deadline: Thursday 2022-11-17 1800

R2-2212986 Correction on 38.304 for SL relay Ericsson, Nokia, Nokia Shanghai Bell CR Rel-17 38.304 17.2.0 0288 3 F NR\_SL\_relay-Core R2-2210970

### 6.7.1 General and stage 2 corrections

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

LS already treated at RAN2#119bis-e

[R2-2211102](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Docs\R2-2211102.zip) LS on setting RRC establishment cause value when relay UE has its own service (C1-225453; contact: vivo) CT1 LS in Rel-17 5G\_ProSe To:RAN2 Cc:SA2

* Withdrawn

Incoming LSs

[R2-2211128](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211128_S2-2209277.doc) Reply LS on Cast Type for Discovery message (S2-2209277; contact: Qualcomm) SA2 LS in Rel-17 5G\_ProSe, NR\_SL\_relay-Core To:RAN2 Cc:CT1

* Noted

[R2-2211142](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211142_R1-2210494.docx) Reply LS on TP to TR 37.985 (R1-2210494; contact: Huawei) RAN1 LS in Rel-17 NR\_SL\_relay-Core To:RAN2

* Noted

[R2-2211147](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211147_R1-2210585.docx) Reply LS on resource pool index in DCI Format 3\_0 (R1-2210585; contact: vivo) RAN1 LS in Rel-17 NR\_SL\_relay-Core To:RAN2

* Noted

[R2-2211141](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211141_R1-2210492.docx) Reply LS to RAN2 on Per-FS L1 feature for NR sidelink discovery BC-list (R1-2210492; contact: OPPO) RAN1 LS in Rel-17 NR\_SL\_enh-Core, NR\_SL\_relay-Core To:RAN2

* Noted

Cast type for discovery message (related to R2-2211128)

[R2-2212135](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38321_CR1484_(Rel-17)_R2-2212135%20-%20Correction%20the%20cast%20type%20for%20discovery%20message%20in%20AS%20layer.docx) Correction the cast type for discovery message in AS layer CATT CR Rel-17 38.321 17.2.0 1484 - F NR\_SL\_relay\_enh-Core

[R2-2212514](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212514%20-%20NR%20SL%20Discovery%20casttype.doc) SL discovery casttype clarification Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

Discussion (joint):

Apple point out there is an additional CR from them. They understand that the logic of the CATT CR is correct, but it should only be applicable to the discovery message, and they see that the receiver side needs some processes to facilitate the filtering. They are OK with a note.

ZTE also have a related CR and would prefer to use a NOTE, to minimise the medication of procedural text.

LG think the discovery message can be transmitted by any cast type, and the discovery message can be handled by filtering based on the first destination address.

Huawei share a similar view to LG, that the discovery response message is unicast, and although there is no cast indicator specified by SA2, the UE implementation may be able to identify the cast type. They see that some MAC impact may be needed.

ZTE indicate that their CR takes the approach that the discovery cast type in SUI is useless, so the RRC spec may also be impacted.

* [AT120][407][Relay] Discovery cast type (Qualcomm)

Scope: Discuss the contributions related to the LS in R2-2211128, evaluate the proposed approaches, and converge on a solution.

Intended outcome: Report to CB session in R2-2213137 and agreeable CR if possible in R2-2213146

Deadline: Wednesday 2022-11-16 1800

[R2-2213137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213137-Report-%5bAT120%5d%5b407%5d%5bRelay%5d%20Discovery%20cast%20type%20(Qualcomm).docx) Summary of [AT120][407][Relay] Discovery cast type (Qualcomm) Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

[Easy proposals]

Proposal 1: RAN2 agree that transmitting UE MAC entity always set the cast type indicator for NR SL discovery messages sent to either BC or GC or UC Layer-2 ID to “broadcast”.

Proposal 2: RAN2 agree the MAC CR in R2-2213146, to add normative text to clarify that the cast type indicator is always set to broadcast for NR sidelink discovery message transmission.

Proposal 4: RAN2 agree that the sl-CastTypeDisc in SUI is always set to broadcast cast type for the NR sidelink discovery messages transmission.

Agreements:

Proposal 1: RAN2 agree that transmitting UE MAC entity always set the cast type indicator for NR SL discovery messages sent to either BC or GC or UC Layer-2 ID to “broadcast”.

Proposal 4: RAN2 agree that the sl-CastTypeDisc in SUI is always set to broadcast cast type for the NR sidelink discovery messages transmission.

[For discussion proposals]

Proposal 4b: RAN2 discuss whether RRC spec change is necessary to support Proposal 4a.

Discussion:

ZTE think the sl-CastTypeDisc in SUI is not needed, but they can accept the majority view to avoid an ASN.1 change. They think the normative text in the SUI procedure needs to be changed, however.

Proposal 3a: RAN2 discuss whether current SL MAC filtering logic defined for broadcast supports receiving UE to receive SL broadcast discovery messages sent to unicast L2 ID, as the Rx UE can always set its own source L2 ID as a destination L2 ID for broadcast message filtering, i.e., no change to MAC spec needed.

Proposal 3b: If proposal 3a is not agreed and change to MAC spec is necessary, RAN2 agree that a new NOTE is added to the MAC spec as below.

NOTE Y: If this TB is associated to broadcast and this TB is corresponding to a logical channel whose associated LCID is equal to 58, and the DST field of the decoded MAC PDU subheader is equal to the 8 MSB of any of the Source Layer-2 ID(s) of the UE for which the 16 LSB are equal to the Destination ID in the corresponding SCI, deliver the decoded MAC PDU to the disassembly and demultiplexing entity.

[R2-2213146](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38.321_CR1507(Rel-17)_R2-2213146_Correction%20on%20cast%20type%20setting%20for%20discovery%20message.docx) Correction on cast type setting for discovery message Qualcomm Incorporated CR Rel-17 38.321 17.2.0 1507 - F NR\_SL\_relay-Core

TP to TR 37.985 (related to R2-2211142)

[R2-2211748](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211748%20Discussion%20on%20TP%20to%20TR%2037.985%20(RAN1%20reply%20LS%20R1-2210494).docx) Discussion on TP to TR 37.985 (RAN1 reply LS R1-2210494) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

* Noted

Discussion:

ZTE think since there is no consensus in RAN2 or RAN1, it would be helpful to send an LS to SA2.

vivo agree with Huawei that it would be better not to pursue anything; they understand that we indicated our technical view to RAN1, but RAN1 need us to take a conclusion as the leading WG

Resource pool index (related to R2-2211147)

[R2-2211669](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211669%20Further%20discussion%20on%20RAN1%20reply%20LS%20in%20R1-2210585%20on%20resource%20pool%20index%20in%20DCI%20Format%203_0.docx) Further discussion on RAN1 reply LS in R1-2210585 on resource pool index in DCI Format 3\_0 vivo discussion

[R2-2211670](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211670%20Correction%20on%20dedicated%20mode-1%20discovery%20transmission%20pool%20in%20TS%2038.306.docx) Correction on dedicated mode-1 discovery transmission pool in TS 38.306 vivo CR Rel-17 38.306 17.2.0 0833 - F NR\_SL\_relay-Core

[R2-2211671](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211671%20Correction%20on%20dedicated%20mode-1%20discovery%20transmission%20pool%20in%20TS%2038.331.docx) Correction on dedicated mode-1 discovery transmission pool in TS 38.331 vivo CR Rel-17 38.331 17.2.0 3629 - F NR\_SL\_relay-Core

Discussion:

vivo understand that we need to use the resource pool ID.

LG have a similar CR, in which they think the communication resource pool is indexed first.

Ericsson think the issue is relevant and updating the description makes sense, but they are not sure about the capability; there is already a discovery capability, and they find this one redundant. They think mode 1 scheduling for discovery is already broken in the previous release.

OPPO think given the agreement in Rel-16, we can still pursue the proposal to put the index for the communication pool first and then the index for the discovery pool. For the capability, they somewhat agree with Ericsson that the new capability can be avoided, and we need to consider that mode 1 scheduling for discovery is a per-band capability; on balance they would prefer no additional capability.

CATT share Ericsson and OPPO’s view on the capability. Considering the first proposal, they wonder why we do not also add a description in the sidelink Tx pool scheduling IE.

vivo do not have a strong view on the capability and can accept Ericsson’s suggestion. For the first proposal, they think we need to use the resource pool ID as the reference for resource pools in both lists, and in light of that, they think we may not need to specify the order of the reference between the two lists; the ID is globally unique within a UE, so we can just use the resource pool IDs to reference any resource pool. This corresponds to option 1 in OPPO’s paper.

Huawei have the same view as Ericsson on the capability; for P1, they think the proposals from OPPO and vivo are both feasible, but they prefer the OPPO proposal for less specification impact.

Apple have a similar view to Huawei; for the index order, they prefer that the Rel-16 pools be indexed first. In light of vivo’s comment, they consider that the pool is configured in dedicated RRC signalling.

vivo indicate that we cannot use an index (e.g. position of entries) to do a global reference to the pools, and we have to use the resource pool ID value, which is globally unique.

Samsung have the same view as Ericsson on the capability; on P1, they prefer OPPO’s version to simplify the spec change.

vivo request some clarification on the OPPO proposal: Does it rely on the index order rather than the globally unique ID? OPPO clarify that they did not take the ID into account. vivo would prefer to down-select between the two, but can accept OPPO’s solution.

Agreements:

Proposal 1 R2 confirms the indexing of the configured Tx resource pools, when there is only sl-TxPoolScheduling, or only sl-DiscTxPoolScheduling, should be based on R16 spec, and thus is not a R17 specific issue.

Proposal 2 R2 confirm when both sl-TxPoolScheduling and sl-DiscTxPoolScheduling are configured, the index of the latter one is defined after the index of the former one, and within each pool type, and within each pool type, R16 index definition rule is used without further change.

Details can be handled in update of RRC rapporteur CR.

Discovery capability (related to R2-2211141)

[R2-2211212](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211212%20-%20Discussion%20on%20R1-2210492.docx) Discussion on R1-2210492 OPPO discussion Rel-17 NR\_SL\_enh-Core, NR\_SL\_relay\_enh-Core

[R2-2211213](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38306_CR0824_(Rel-17)_R2-2211213%20-%20Correction%20for%20NR%20SL%20discovery%20capability_V03.docx) Correction for NR SL discovery capability OPPO, Intel CR Rel-17 38.306 17.2.0 0824 - F NR\_SL\_enh-Core, NR\_SL\_relay\_enh-Core

[R2-2211214](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3571_(Rel-17)_R2-2211214%20-%20Correction%20for%20NR%20SL%20discovery%20capability_V02.docx) Correction for NR SL discovery capability OPPO, Intel CR Rel-17 38.331 17.2.0 3571 - F NR\_SL\_enh-Core, NR\_SL\_relay\_enh-Core

Discussion:

OPPO indicate the point is to design the signalling for the per-FS discovery capability in line with the RAN1 guidance.

Huawei have two questions: (1) There is an indication added for the communication BC, to indicate whether the per-FS capability is applicable to discovery; but they understand that we normally do not derive a capability from one BC to another BC, because it may be difficult from the network side to distinguish which BCs are the same. (2) The new IEs added seem similar to existing ones, and they wonder if we could reuse the existing parameters for communication.

OPPO indicate on the first question, the main reason is to avoid double reporting per BC of the per-FS capability, so the capability relies on the communication BC list, and in the discovery BC list we would have only the BCs that support only discovery and not communication. On the second question, they are not sure what IEs Huawei have a concern with.

Huawei indicate that the new IEs for discovery (BandParametersSidelinkDiscovery) overlap with the parameters already included in the communication capability. OPPO understand that our LS to RAN1 indicated that we have the communication capability and are not sure if it should be reported for discovery as well, and the response indicated that it should be added to the BC list for discovery.

Huawei wonder why we reuse BandParametersSidelinkEUTRA-NR.

* [AT120][408][Relay] Discovery capability signalling (OPPO)

Scope: Starting from the CRs in R2-2211213 and R2-2211214, converge on agreeable signalling details.

Intended outcome: Endorsable CRs (with R2-2211214 revised to R2-2213147), and report in R2-2213128

Deadline: Wednesday 2022-11-16 1800

[R2-2213128](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213128%20-%20Summary%20of%20%5bAT120%5d%5b408%5d%20Discovery%20capability%20signalling%20(OPPO).docx) Summary of [AT120][408] OPPO discussion Rel-17 NR\_SL\_enh-Core, NR\_SL\_relay\_enh-Core

Proposal-1: RAN2 to discuss, for a BC supporting both discovery and communication, report per-FS capability 15-25, 32-4 and 32-5a-1 in the communication BC-list (supportedBandCombinationListSidelinkEUTRA-NR) only.

Proposal-2: When introducing the per-FS capability (15-25, 32-4 and 32-5a-1) to discovery BC list, create a new IE (e.g., BandParametersSidelinkDiscovery-v17xy) as in R2-2211213/1214.

Proposal-3: Extend the sidelinkRequest to discovery, and adopt the change-3 in R2-2211214 .

R2-2213147 Correction for NR SL discovery capability OPPO, Intel, Ericsson CR Rel-17 38.331 17.2.0 3571 1 F NR\_SL\_enh-Core, NR\_SL\_relay\_enh-Core

CR to 37.340

[R2-2211672](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\37340_CR0351_(Rel-17)_R2-2211672_Correction%20to%20TS%2037.340%20on%20Sidelink%20based%20U2N%20Relay.docx) Correction to TS 37.340 on Sidelink based U2N Relay vivo CR Rel-17 37.340 17.2.0 0351 - F NR\_SL\_relay-Core

CRs to 38.300

[R2-2211806](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211806%20Corrections%20on%20SRAP%20bearer%20mapping.docx) Corrections on SRAP bearer mapping ASUSTeK CR Rel-17 38.300 17.2.0 0580 - F NR\_SL\_relay-Core

[R2-2211900](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211900%20Corrections%20to%20TS%2038.300%20for%20SL%20relay.docx) Corrections to TS 38.300 for SL relay ZTE, Sanechips, Apple CR Rel-17 38.300 17.2.0 0582 - F NR\_SL\_relay-Core

[R2-2212067](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212067-%20CR0584%20Corrections%20for%20sideling%20relay%20in%20stage%202%20specification%20v2.0.docx) Corrections for sideling relay in stage 2 specification Lenovo Information Technology CR Rel-17 38.300 17.2.0 0584 - F NR\_SL\_relay-Core

* [AT120][410][Relay] Rel-17 relay stage 2 CRs (vivo)

Scope: Check the CRs in R2-2211672 / R2-2211806 / R2-2211900 / R2-2212067 and merge agreeable ones.

Intended outcome: Agreed CRs (by email if possible) in R2-2213311 (38.300) and R2-2213145 (37.340)

Deadline: Thursday 2022-11-17 1800

R2-2213311 Corrections to TS 38.300 for SL relay vivo, ASUSTeK, ZTE, Sanechips CR Rel-17 38.300 17.2.0 0598 - F NR\_SL\_relay-Core

R2-2213145 Correction to TS 37.340 on Sidelink based U2N Relay vivo CR Rel-17 37.340 17.2.0 0351 1 F NR\_SL\_relay-Core

Rapporteur CR

[R2-2211749](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3638_(Rel-17)_R2-2211749_RRC%20corrections%20for%20SL%20relay.docx) RRC corrections for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3638 - F NR\_SL\_relay-Core

* [AT120][409][Relay] Rel-17 relay RRC CR (Huawei)

Scope: Check and update the CR in R2-2211749 with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2213138 and report in R2-2213153

Deadline: Thursday 2022-11-17 1800

R2-2213153 (Report of [409]) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

R2-2213138 RRC corrections for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3638 1 F NR\_SL\_relay-Core

### 6.7.2 Control plane corrections

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

AI summary

[R2-2213117](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213117%20%5bPre120%5d%5b402%5d%5bRelay%5d%20Summary%20of%20agenda%20item%206.7.2.docx) [Pre120][402][Relay] Summary of agenda item 6.7.2 on relay control plane (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

Proposal 1: Revise the IPA CR R2-2211747 by removing the change “… enter RRC\_IDLE, and …” in clause 5.3.7.2.

Proposal 2: The intentions of R2-2211674, Change #1 in R2-2211949, R2-2212066, R2-2212204 are agreeable, and the detailed wording can be checked in CR update.

Proposal 3: The following proposals or contributions are to be discussed together with RAN1 LS R2-2211147 (Reply LS on resource pool index in DCI Format 3\_0): P1 and P2 in R2-2211210, R2-2211606, Change #3 in R2-2212136, R2-2212399, and R2-2212694.

Proposal 4: R2-2211899 is to be discussed together with SA2 LS R2-2211128 (Reply LS on Cast Type for Discovery message).

Proposal 9: R2-2212434 is to be discussed together with RAN1 LS R2-2211141 (Reply LS to RAN2 on Per-FS L1 feature for NR sidelink discovery BC-list).

Proposal 5: RAN2 confirm that Uu threshold condition does not restrict discovery monitoring (it is sufficient that remote UE checks Uu threshold before relay (re)selection), and agree the following changes. The detailed wording can be further checked in CR update.

– To remove the Uu threshold condition on Remote UE’s discovery monitoring in 5.8.3.2, 5.8.14.1, 5.8.15.1;

– To add “and for NR sidelink U2N Relay (re)selection” in the general procedure in 5.8.15.1;

– Confirm the last meeting agreement that the change #4 in R2-2210625 (to TS 38.304) is agreeable, i.e. remove restriction on discovery monitoring.

Proposal 6: For full configuration, to clarify the following aspects in 5.3.5.11:

– If the UE is acting as L2 U2N Remote UE after reconfiguration with sync or during re-establishment or RRC resume, it does not apply default L1 parameters and default MAC Cell Group configuration as specified in 9.2.2.

– L2 U2N Remote UE applies default configuration of SL-RLC1 for SRB1.

– When the target is a L2 U2N Relay UE, the Remote UE only applies T311 but not applies T310 and constants N310, N311.

Proposal 7: The intention of removing “AS threshold checking” from the condition of “consider no NR sidelink U2N Relay UE to be selected” in clause 5.8.15.3 is agreeable, and the detailed change can be checked during CR update.

Proposal 8: RAN2 can discuss the following if time allows:

– A: Upon handover, relay UE doesn’t send NotificationMessageSidelink message, if the PCell doesn’t change.

– B: OOC Remote UE in RRC\_IDLE/INACTIVE can use preconfigured resource if the forwarded SIB12 doesn’t include normal pool and exception pool, from the moment the UE initiates RRC connection establishment or RRC connection resume, until receiving an RRCReconfiguration including sl-ConfigDedicatedNR, or receiving an RRCRelease or an RRCReject.

– C: How to enhance the serving relay reporting if consider there is power imbalance between SL-RSRP and SD-RSRP:

 1. Adding a new flag that indicates whether the reported value is an SL-RSRP or an SD-RSRP

 2. Reporting a compensated value instead of the measured SL-RSRP:

 2a) The measured SL-RSRP is increased, by the reporting UE by the difference between its maximum and the actually used transmission power over the given PC5 unicast link

 2b) The measured SL-RSRP is increased, by the reporting UE, by the pathloss over the given PC5 unicast link

 2c) The measured SL-RSRP is increased, by the reporting UE by the sl-HystMin of the serving cell of the L2N Remote UE.

Discussion:

On P2, Ericsson were not sure about the intention of R2-2211674. vivo understand that this is a case where the SL RLC entity, not the Uu RLC entity, should be released.

Huawei indicate that the scenario is that the remote UE is released to RRC\_INACTIVE when connected to a relay UE, and in this case the remote UE may want to keep the PC5 unicast link, so the SL RLC entity is still there. When the remote UE wants to resume to RRC\_CONNECTED, the remote UE needs to apply the default SL RLC configuration, and we do not currently explain how to handle the RLC entity in this case; vivo’s proposal is that if there is such an entity, the UE needs to release it and re-establish it if necessary. Ericsson wonder why this is necessary when we still have the PC5 link.

vivo think if the UE decides to release the PC5 link, the PC5-RLC entity will certainly be released, and if it does not release the PC5 link, current operation still requires the UE to release a Uu RLC entity that does not exist.

Ericsson understand that the wording may need to be massaged.

On P5, Xiaomi think it is necessary to clarify that the threshold only applies to relay discovery, not to non-relay discovery. Huawei think this is common understanding.

On P7, Xiaomi think this was previously discussed and companies felt the current spec is fine. They see it as a cosmetic change. Huawei agree it was discussed last meeting, but they think the reason for disagreement then was an incorrect “Reason for change”, and this version has this point clarified; they see the spec as clearer with this change. Apple want to clarify that the detailed wording can still be discussed.

On P8A, LG do not support it because they think the relay should send a notification message to the remote UE, allowing the remote UE to prepare for relay reselection.

ZTE think the issue on SyncRef for remote UE from their contribution also needs to be discussed.

Ericsson think P8A is a bit of an optimisation.

Qualcomm also think this has been discussed in the past, and they agree with LG.

Xiaomi understand companies would prefer to have the remote UE decide whether to reselect, but they see that in the current spec, upon reception of the notification message, the remote UE has to perform re-establishment, and there is no room for the remote UE to keep the connection in this case.

Lenovo agree with Ericsson.

Huawei think on the point from Xiaomi, the reason we specify that the remote UE will trigger re-establishment is to avoid group handover, and they see that this is a handover case even though the PCell does not change.

On P8B, Apple wonder if this is really a critical issue; a gNB would normally configure the pools, and they see this as more of a misconfiguration. Ericsson think we cannot force the gNB to always provide the pools; it is up to gNB implementation, and this CR addresses the case where the gNB does not provide it.

Xiaomi understand that there is a view that the network can always provide the pools, but they see this as an unreasonable restriction on the network, and they think preconfiguration should be allowed in this case; they do not consider that this breaks the legacy principle of operation, since it only allows the UE OOC to use preconfiguration.

Huawei agree with Apple that this is not a very reasonable network behaviour. On Xiaomi’s comment that the proposal is only applicable OOC, they do not agree since the IC case has the same situation and the remote UE may need to obtain the configuration from SIB12. MediaTek and Qualcomm agree with Huawei.

OPPO have the same view as Huawei; they understand that previously we had the exceptional pool in SIB12, and this CR introduces a case where the UE would need to use preconfiguration IC. If we allow this, they understand that the historical rule in this respect would be changed.

Ericsson clarify that the intention of the proposal is for IC UEs to go to connected mode to get the pools from dedicated signalling.

Apple want to understand why this proposal for IC UEs does not defeat the purpose of using a relay; they think it is still more correct for the network to configure the pools.

Xiaomi understand for the IC UE, the UE should reselect to the cell and not depend on the relay any more, but the OOC UE would be able to use preconfiguration.

Huawei think this proposal has been discussed several times on the reflector and pursuing it further would not be so helpful.

On P8C, Ericsson think this is a performance optimisation and it is too late.

Samsung think we have discussed the issue previously and agreed not to handle the power imbalance issue, so they see it as an optimisation.

LG think the levels can be totally different, and they wonder how the remote UE can recognise that the SD-RSRP and SL-RSRP are coming from the same relay UE.

Nokia indicate that the problem is that the UE is sending either SL-RSRP or SD-RSRP, and the gNB does not know what is sent; the ranges can be totally different, and the gNB cannot do anything with these values. So they do not see it as an enhancement, and they think the earlier agreement from RAN2#117 on this point needs to be revisited.

Huawei have some sympathy and think in the previous meeting we only discussed whether separate thresholds need to be configured for SL-RSRP and SD-RSRP; there was a majority view then that we do not need to do the differentiation, but here they see that there is no good way to do the comparison.

vivo wonder even if we distinguish them what the gNB will do differently when it receives the measurement reports; they are not sure the gNB can do much.

Apple think the power imbalance issue cannot be solved by just reporting the quantities separately, and they would rather not take a partial solution.

LG think the gNB can recognise which one is being reported based on the L2ID of the relay UE.

Ericsson agree with Apple; the issue involves both UE and gNB, the real reason is the underlying power imbalance, and we should have a complete solution from both sides. They also think a similar situation was previously discussed and left to UE implementation.

Agreements:

Proposal 1: Revise the IPA CR R2-2211747 by removing the change “… enter RRC\_IDLE, and …” in clause 5.3.7.2.

Proposal 2: The intentions of R2-2211674, Change #1 in R2-2211949, R2-2212066, R2-2212204 are agreeable, and the detailed wording can be checked in CR update.

Proposal 5 (modified): RAN2 confirm that Uu threshold condition does not restrict relay discovery monitoring (it is sufficient that remote UE checks Uu threshold before relay (re)selection), and agree the following changes. The detailed wording can be further checked in CR update.

– To remove the Uu threshold condition on Remote UE’s discovery monitoring in 5.8.3.2, 5.8.14.1, 5.8.15.1;

– To add “for NR sidelink U2N Relay (re)selection” in the general procedure in 5.8.15.1;

– Confirm the last meeting agreement that the change #4 in R2-2210625 (to TS 38.304) is agreeable, i.e. remove restriction on discovery monitoring.

Proposal 6: For full configuration, to clarify the following aspects in 5.3.5.11:

– If the UE is acting as L2 U2N Remote UE after reconfiguration with sync or during re-establishment or RRC resume, it does not apply default L1 parameters and default MAC Cell Group configuration as specified in 9.2.2.

– L2 U2N Remote UE applies default configuration of SL-RLC1 for SRB1.

– When the target is a L2 U2N Relay UE, the Remote UE only applies T311 but not applies T310 and constants N310, N311.

Proposal 7: The intention of removing “AS threshold checking” from the condition of “consider no NR sidelink U2N Relay UE to be selected” in clause 5.8.15.3 is agreeable, and the detailed change can be checked during CR update.

R2-2211898 to be checked as part of the RRC CR discussion.

The following documents will not be individually treated

[R2-2211210](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211210%20-%20Discussion%20on%20left%20issues%20for%20CP.docx) Discussion on left issues for CP OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2211296](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211296.doc) Discussion on the AS layer condition for a remote UE SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2211606](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211606%20Discussion%20on%20the%20support%20of%20discovery%20RP%20scheduling.doc) Discussion on the support of discovery RP scheduling Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2211673](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211673_Discussion%20on%20a%20questionable%20change%20in%20IPA%20CR%20R2-2210902.docx) Discussion on a questionable change in IPA CR R2-2210902 vivo discussion

[R2-2211674](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3630_(Rel-17)_R2-2211674_Correction%20to%20RLC%20handling%20upon%20reception%20of%20RRCRelease%20message%20with%20suspendConfig.docx) Correction to RLC handling upon reception of RRCRelease message with suspendConfig vivo CR Rel-17 38.331 17.2.0 3630 - F NR\_SL\_relay-Core

[R2-2211750](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211750%20Remaining%20CP%20corrections%20for%20SL%20relay.docx) Remaining CP correction for sidelink relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2211872](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211872.docx) Correction on handover notification forwarding Xiaomi CR Rel-17 38.331 17.2.0 3653 - F NR\_SL\_relay-Core

[R2-2211873](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211873.docx) Correction on remote UE's resource allocation Xiaomi, Ericsson CR Rel-17 38.331 17.2.0 3654 - F NR\_SL\_relay-Core

[R2-2211898](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3724_(Rel-17)_R2-2211898%20Correction%20on%20sync%20reference%20resource%20selection%20for%20remote%20UE.docx) Correction on sync reference resource selection for remote UE ZTE, Sanechips CR Rel-17 38.331 17.2.0 3724 - F NR\_SL\_relay-Core

Discussion:

Huawei think this offers the risk of misalignment between the remote and relay UEs.

vivo think for the sync source selection, we have a priority order, and even if gNBeNB is configured as the source, it is possible for the UE to select other sync sources if the indicated one cannot be found; so they think the UE should be able to work anyway.

ZTE think based on the current specification, if the gNB configures itself as the highest priority for synchronisation, the UE cannot select another synchronisation source, and the CR adds a condition to skip this case and select another source. So they think the CR enables the same behaviour described by vivo.

vivo think if there are different understandings, we may need to check company views. If ZTE are right, there could be a real blocking issue.

Ericsson agree with Huawei and think we should stick with the existing specification.

vivo wonder if we should send an LS to RAN1 if there is no convergence in RAN2.

[R2-2211899](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211899%20Correction%20on%20cast%20type%20for%20discovery%20message.docx) Corrections on cast type for SL discovery ZTE, Sanechips discussion Rel-17 NR\_SL\_relay-Core

[R2-2211949](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211949%20Miscellaneous%20corrections%20on%20TS%2038.331%20for%20NR%20sidelink%20relay.docx) Miscellaneous corrections on TS 38.331 for NR sidelink relay Xiaomi CR Rel-17 38.331 17.2.0 3661 - F NR\_SL\_relay-Core

[R2-2212066](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212066%20-%20CR3670%20Corrections%20for%20sideling%20relay%20in%20TS38.331%20v2.0.docx) Corrections for sideling relay in TS38.331 Lenovo Information Technology CR Rel-17 38.331 17.2.0 3670 - F NR\_SL\_relay-Core

[R2-2212136](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3675_(Rel-17)_R2-2212136%20-%20Miscellaneous%20corrections%20on%20TS%2038.331%20for%20NR%20Sidelink%20Relay.docx) Miscellaneous corrections on TS 38.331 for NR Sidelink Relay CATT CR Rel-17 38.331 17.2.0 3675 - F NR\_SL\_relay\_enh-Core

[R2-2212204](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_R2-2212204_draftCR_Correction%20on%20RRC%20for%20SL%20relay.docx) Correction on RRC for SL relay Samsung draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

[R2-2212252](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212252%20SLRP-Clarification.docx) RSRP measurement issue Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core Late

[R2-2212399](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212399%20On%20Mapping%20Resource%20Pool%20Index%20in%20DCI%20format%203_0.docx) On Mapping Resource Pool Index in DCI format 3\_0 Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core

[R2-2212434](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38.331_CR3701(Rel-17)_R2-2212434-%20Clarification%20on%20capability%20filter%20for%20sidelink%20relay.docx) Clarification on capability filter for sidelink relay Ericsson CR Rel-17 38.331 17.2.0 3701 - F NR\_SL\_relay-Core

[R2-2212658](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212658%20Correction%20on%20full%20configuration%20for%20remote%20UE.DOC) Correction on full configuration for remote UE Sharp discussion

[R2-2212666](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212666%20Correction%20on%20full%20configuration%20for%20remote%20UE%20in%2038.331.doc) Correction on full configuration for remote UE in 38.331 Sharp draftCR Rel-17 38.331 17.2.0 NR\_SL\_relay-Core

[R2-2212694](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212694-38331_draftCR_Correction%20for%20handling%20dedicated%20discovery%20resource%20pool%20for%20U2N%20Relay.docx) Correction for handling dedicated discovery resource pool for U2N Relay LG Electronics France draftCR Rel-17 38.331 17.2.0 F NR\_SL\_relay-Core

### 6.7.3 User plane corrections

Including SRAP aspects and QoS.

Cast type for discovery message (related to R2-2211128)

[R2-2211397](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38321_1459_(Rel-17)_R2-2211397_Correction%20on%20cast%20type%20setting%20of%20discovery%20message_cl.docx) Correction on cast type setting of discovery message OPPO CR Rel-17 38.321 17.2.0 1459 - F NR\_SL\_relay-Core

[R2-2211701](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211701%20Discussion%20on%20SA2%20reply%20LS%20on%20cast%20type%20for%20SL%20discovery.doc) Discussion on SA2 Reply LS on cast type for discovery message Apple discussion NR\_SL\_relay-Core

[R2-2211702](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211702%20corrections%20on%20MAC%20for%20SL%20discovery%20cast%20type.docx) Correction on the cast type in SL discovery transmission and reception Apple CR Rel-17 38.321 17.2.0 1470 - F NR\_SL\_relay-Core

CRs to 38.321

[R2-2211398](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38321_1460_(Rel-17)_R2-2211398_Correction%20on%20exceptional%20resource%20pool%20usage%20for%20discovery%20message%20transmission_cl.docx) Correction on exceptional resource pool usage for discovery message transmission OPPO CR Rel-17 38.321 17.2.0 1460 - F NR\_SL\_relay-Core

* Not pursued

Discussion:

Apple understand that this will be discussed in NR V2X corrections.

OPPO understand that there is a related submission there, but the scope is a bit different; here it is related to discovery message transmission, and they would prefer to treat them separately.

Xiaomi think with the change, discovery cannot use the exceptional pool, and they are not sure this is right.

Apple think the motivation is the same for the NR V2X correction, and they do not see a need for further clarification in any release.

Qualcomm indicate that last meeting we made some changes that already covered this case in the RRC.

OPPO intend the change to clarify that when there is no dedicated configuration, the UE should use the normal pool if configured, but it should not use the exceptional pool.

Related to discovery cast type

[R2-2211605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211605%20Clarification%20on%20MAC%20filtering%20for%20discovery%20message.docx) Clarification on MAC filtering for discovery message Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

CR to 38.322

[R2-2211703](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211703%20Misc%20corrections%20on%20RLC%20for%20SL%20Relay.docx) Miscellaneous Correction on the RLC for U2N relay-specific operations Apple CR Rel-17 38.322 17.1.0 0051 - F NR\_SL\_relay-Core

Discussion:

Samsung think the first and second changes are OK, but they wonder if the third change is for normal UE operation; they thought this language was specific to backhaul data in IAB.

Agreement:

First and second changes from R2-2211703 are merged into the RLC rapporteur CR.

CR to 38.351

[R2-2212137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38351_CR0013_(Rel-17)_R2-2212137%20-%20Correction%20on%20SRAP%20for%20sidelink%20relay.docx) Correction on SRAP for sidelink relay CATT CR Rel-17 38.351 17.2.0 0013 - F NR\_SL\_relay\_enh-Core

* Endorsed for merge into the SRAP rapporteur CR

Discussion:

OPPO understand the reason is to align the text stylistically, and they think it is OK.

DRX alignment

[R2-2211503](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211503%20-%20Alignment%20between%20remote%20UE%20paging%20DRX%20and%20relay%20UE%20Uu%20DRX.docx) Alignment between remote UE paging DRX and relay UE Uu DRX Ericsson discussion Rel-17 NR\_SL\_relay-Core R2-2209860

* Noted

Discussion:

Samsung are not sure there is any paging latency issue in normal UE operation; we do not optimise for it in normal cases.

OPPO think the change is an optimisation and we can rely on UE implementation.

InterDigital see some value in the proposal; they think it reduces the latency associated with SL DRX that may slow down the reception.

LG agree with OPPO.

Qualcomm think it is an optimisation and too late to address.

Nokia agree with Samsung.

Ericsson do not believe this is a UE implementation issue, because the gNB needs to understand when the UE is in active time.

Apple wonder if this is really a correction; they see it more as a new feature. Huawei agree with Apple and think this is a big change to the DRX cycle. They think there would be interoperability issues between UE and network if we took this.

[R2-2211504](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211504%20-%20Corrections%20to%2038321%20CR1417%20on%20alignment%20between%20remote%20UE%20paging%20DRX%20and%20relay%20UE%20Uu%20DRX.docx) Corrections to 38.321 on alignment between remote UE paging DRX and relay UE Uu DRX Ericsson CR Rel-17 38.321 17.2.0 1417 1 F NR\_SL\_relay-Core R2-2209861

* Not pursued

## 6.11 NR positioning enhancements

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

Tdoc Limitation: 4 tdocs

### 6.11.0 In-principle agreed CRs

CRs AIP from RAN2#119bis-e.

[R2-2211255](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211255%20Correction%20to%20MAC%20spec%20for%20Positioning%20enhancement_final.docx) Correction to MAC spec for Positioning enhancement Huawei, HiSilicon CR Rel-17 38.321 17.2.0 1408 2 F NR\_pos\_enh-Core R2-2210894

* Agreed with coversheet revision as R2-2213126

Discussion:

CATT think there is a change (“with the indicated TAG” vs. “with this TAG”) compared to the AIP version.

Lenovo think there is a mistake in the coversheet description in respect of the field description in the MAC CE. Huawei think this can be revised.

[R2-2213126](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213126%20Correction%20to%20MAC%20spec%20for%20Positioning%20enhancement_final.docx) Correction to MAC spec for Positioning enhancement Huawei, HiSilicon CR Rel-17 38.321 17.2.0 1408 3 F NR\_pos\_enh-Core R2-2210894

* Agreed

[R2-2211256](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211256%20Correction%20to%20UE%20capability%20for%20DL-AoD_v00.docx) Correction to UE capability for DL-AoD Huawei, HiSilicon CR Rel-17 37.355 17.2.0 0379 2 F NR\_pos\_enh-Core R2-2210975

* Agreed

[R2-2212232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212232_(CR%2037355-h20)_v02.docx) Various LPP Corrections Qualcomm Incorporated (Rapporteur) CR Rel-17 37.355 17.2.0 0386 1 F NR\_pos\_enh-Core R2-2210904

* [AT120][405][POS] Update of LPP CR (Qualcomm)

Scope: Check and update the CR in R2-2212232, taking into account decisions of this meeting.

Intended outcome: Agreeable CR in R2-2213135 and report in R2-2213272

Deadline: Wednesday 2022-11-16 1800

[R2-2213135](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213135_(CR%2037355-h20)_v04.docx) Various LPP Corrections Qualcomm Incorporated (Rapporteur) CR Rel-17 37.355 17.2.0 0386 2 F NR\_pos\_enh-Core R2-2210904

[R2-2213272](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213272_(Summary%20of%20%5bAT120%5d%5b405%5d%5bPOS%5d%20Update%20of%20LPP%20CR)_v09_Rap.docx) Summary of [AT120][405][POS] Update of LPP CR (Qualcomm) Qualcomm Incorporated discussion Rel-17 NR\_pos\_enh-Core

[R2-2212482](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212482%20IPACap.docx) Correcting PRS capability information reported to gNB Ericsson, Nokia, Nokia Shanghai Bell, Lenovo CR Rel-17 38.306 17.2.0 0815 2 F NR\_pos\_enh-Core R2-2210907

* Endorsed for merge into the mega CR

[R2-2212484](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212484%20RRCIPA.docx) Miscellaneous correction for Positioning Ericsson CR Rel-17 38.331 17.2.0 3534 4 F NR\_pos\_enh-Core R2-2210983

* [AT120][406][POS] Rel-17 positioning RRC CR (Ericsson)

Scope: Review and update the CR in R2-2212484 with decisions of this meeting.

Intended outcome: Agreeable CR in R2-2213136

Deadline: Wednesday 2022-11-16 1800

R2-2213136 Miscellaneous correction for Positioning Ericsson CR Rel-17 38.331 17.2.0 3534 5 F NR\_pos\_enh-Core R2-2210983

Withdrawn/Not available

R2-2212363 Correcting PRS capability information reported to gNB Ericsson, Nokia, Nokia Shanghai Bell, Lenovo CR Rel-17 38.306 17.2.0 0836 - F NR\_pos\_enh-Core Withdrawn

R2-2212364 Miscellaneous correction for Positioning Ericsson CR Rel-17 38.331 17.2.0 3690 - F NR\_pos\_enh-Core Withdrawn

### 6.11.1 General and stage 2 corrections

Incoming LSs, etc., and any stage 2 corrections (impact to 36.305 or 38.305). Stage 2 corrections without functional impact will be treated at lower priority or not at all.

LSs already treated in RAN2#119bis-e

[R2-2211112](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211112_R3-225268.docx) LS on SRS-PosRRC-InactiveConfig configuration signalling (R3-225268; contact: Intel) RAN3 LS in Rel-17 NR\_pos\_enh-Core To:RAN2

* Withdrawn

[R2-2211117](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211117_R4-2214493.docx) Reply LS on the UE/TRP TEG framework (R4-2214493; contact: CATT) RAN4 LS in Rel-17 NR\_pos\_enh-Core To:RAN1, RAN2, RAN3

* Withdrawn

Incoming LSs

[R2-2211137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211137_S2-2209966.docx) LS on GNSS integrity requirement provisioning (S2-2209966; contact: Huawei) SA2 LS in Rel-17 5G\_eLCS\_ph2 To:RAN2 Cc:SA1

[R2-2211143](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211143_R1-2210528.docx) Reply LS on support of positioning in FR2-2 (R1-2210528; contact: Samsung) RAN1 LS in Rel-17 NR\_pos\_enh, NR\_ext\_to\_71GHz To:RAN2 Cc:RAN4

Discussion:

Samsung indicate there are related CRs.

Nokia interpreted that RAN1 have no confirmation that positioning with the new SCSs is supported in Rel-17, so they think we should exclude the SRS case now as well.

Huawei understood that RAN1 will not further work on this, and their interpretation is that RAN2 do not need to do anything regarding the SRS case.

* Noted

GNSS integrity (related to R2-2211137)

[R2-2211422](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211422%20Discussion%20on%20the%20LS%20on%20GNSS%20integrity%20requirement%20provisioning.docx) Discussion on the LS on GNSS integrity requirement provisioning CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2211837](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211837%20Draft%20reply%20LS%20on%20GNSS%20integrity%20requirement%20provision.docx) Draft reply LS on GNSS integrity requirement provision OPPO LS out Rel-17 NR\_pos\_enh-Core To:SA2 Cc:SA1

[R2-2212233](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212233_(integrity%20SA2%20LS).docx) GNSS Integrity Requirement Provisioning Qualcomm Incorporated discussion

[R2-2212922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212922_Draft%20Reply%20LS%20on%20GNSS%20integrity%20requirement%20provisioning.docx) Draft Reply LS on GNSS integrity requirement provisioning vivo LS out Rel-17 NR\_pos\_enh-Core To:SA2 Cc:SA1

[R2-2212959](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212959%20Draft%20reply%20LS%20on%20GNSS%20integrity%20requirement%20provisioning_v01.docx) Draft Reply LS on GNSS integrity requirement provisioning Huawei LS out Rel-17 NR\_pos\_enh-Core To:SA2

* [AT120][404][POS] LS on GNSS integrity requirement provisioning (Huawei)

Scope: Discuss the LS in R2-2211137 and the received draft replies to this meeting, and converge on an understanding for a draft reply.

Intended outcome: Report to CB session in R2-2213134, and approvable LS in R2-2213151 if possible

Deadline: Wednesday 2022-11-16 1800

R2-2213134 (Report of [AT120][404]) Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

R2-2213151 Draft Reply LS on GNSS integrity requirement provisioning Huawei LS out Rel-17 NR\_pos\_enh-Core To:SA2

CRs to 38.305

[R2-2211424](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38305_CR0111_(Rel-17)_R2-2211424.docx) Corrections on TS38.305 CATT CR Rel-17 38.305 17.2.0 0111 - F NR\_pos\_enh-Core

[R2-2212356](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212356%20Stage2.docx) Miscelenous corrections for stage2 Ericsson CR Rel-17 38.305 17.2.0 0112 - F NR\_pos\_enh-Core

[R2-2212686](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212686%20Discussion%20on%20gNB's%20support%20of%20UL%20MAC%20CE%20for%20pre-configured%20MG.docx) Discussion on gNB's support of UL MAC CE for pre-configured MG ZTE Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2212687](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212687%20Correction%20on%20the%20gNB's%20behaviour%20for%20pre-configured%20MG.docx) Correction on the gNB's behaviour for pre-configured MG ZTE Corporation CR Rel-17 38.305 17.2.0 0115 - F NR\_pos\_enh-Core

[R2-2212688](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212688%20Correction%20on%20assistance%20data%20instances%20in%2038.305.docx) Correction on assistance data instances in 38.305 ZTE Corporation CR Rel-17 38.305 17.2.0 0116 - F NR\_pos\_enh-Core

[R2-2212929](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212929%20CR%20for%20miscellaneous%20corrections.docx) CR for miscellaneous corrections vivo draftCR Rel-17 38.305 17.2.0 F NR\_pos\_enh-Core

### 6.11.2 RRC corrections

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

CRs to 38.331

[R2-2211423](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3597_(Rel-17)_R2-2211423.docx) Corrections on derivation of pathloss reference for TA validation of SRS CATT CR Rel-17 38.331 17.2.0 3597 - F NR\_pos\_enh-Core

* Endorsed to be merged into the RRC rapporteur CR

Discussion:

Intel think the reason for change is not so clear.

[R2-2211543](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38331_CR3612_(Rel-17)_R2-2211543%20Positioning%20corrections.docx) Miscellaneous corrections to NR positioning enhancements Lenovo CR Rel-17 38.331 17.2.0 3612 - F NR\_pos\_enh-Core

* Endorsed to be merged into the RRC rapporteur CR

Discussion:

ZTE agree with the principle of the CR, but they think for the first change, the last part should not be included, because when SetupRelease is used, only the setup branch behaviour is specified. Lenovo think we regularly do specify the release branch as well. Intel have the same understanding as Lenovo, e.g., as used in mrdc-SecondaryCellGroupConfig. Lenovo indicate that there are guidelines in section A.3.x that can be checked.

Optionality of MG activation/deactivation UL MAC CE

[R2-2212355](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212355%20MACDisc.docx) Discussion on NW configuration for UL MAC CE Ericsson discussion Rel-17 NR\_pos\_enh-Core

* Noted

Discussion:

ZTE support having optional support at the network, but they do not think it needs to be explicitly indicated to the UE; the UE should assume that the gNB may reject the activation/deactivation request, and they think a NOTE in stage 2 can solve the problem.

OPPO wonder why the gNB cannot support the MAC CE; they think the CR from Ericsson will complicate the UE behaviour.

Xiaomi think if the gNB does not support the UL MAC CE but the UE does, there would need to be an enhancement to NRPPa to indicate the support from the LMF to the gNB.

Qualcomm have the same view as ZTE and Xiaomi; they think this is the same situation as the LocationMeasurementIndication, where the UE makes a request and the gNB may grant it or not. So they understand that a non-supporting gNB could just ignore the MAC CE.

Huawei see both interpretations and would be OK with leaving it to implementation, but they think there would be value in having a NOTE saying it is up to the network whether to respond.

vivo wonder why the network would only implement the LMF-initiated version; they see the UE-initiated version as being more simple.

Ericsson think having a NOTE in the stage 2 will not do anything; the problem is that the gNB may not even be able to decode the MAC CE, and it may discard the packet causing an error scenario due to HARQ failure.

Intel understand that the network should be able to decode the MAC CE even if it does not support the feature.

OPPO do not see why HARQ failure would result from not decoding the MAC CE.

[R2-2211261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211261%20Correction%20to%20pre-configured%20MG%20request.docx) Correction to pre-configured MG request Huawei, HiSilicon CR Rel-17 38.331 17.2.0 3574 - F NR\_pos\_enh-Core

[R2-2212073](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212073%20Discussion%20on%20the%20preconfigured%20MG%20activation%20and%20deactivation%20request.doc) Discussion on the preconfigured MG activation and deactivation request Xiaomi discussion

[R2-2212365](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212365%20RRCPositioning.docx) Miscellaneous correction for Positioning Ericsson CR Rel-17 38.331 17.2.0 3691 - F NR\_pos\_enh-Core

### 6.11.3 LPP corrections

Corrections to 37.355.

CRs to 37.355

[R2-2211259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211259%20Remaining%20issues%20on%20PRS%20validity%20area.doc) Remaining issues on PRS validity area Huawei, HiSilicon discussion Rel-17 37.355 NR\_pos\_enh-Core

* Noted

Proposal1: When the UE receives PRS configuration with the field assistanceDataValidityArea, the UE shall:

 If the UE does not have combinations of cells defined within assistanceDataValidityArea for which it has already stored PRS assistance data, the UE stores a new instance of PRS configuration

 If the UE already has combinations of cells defined within asssitanceDataValidityArea for which it has already stored PRS assistance data, the UE overwrites the previous instance of PRS configuration

Discussion:

Huawei clarify that the second bullet refers to receiving new PRS assistance data with the same combination of cells as an existing validity area.

ZTE think the first bullet is a sort of ToAddMod list, which we currently do not have for the validity area.

Qualcomm agree with ZTE and think it goes together with the release behaviour in P3; they do not see this as workable for an LMF, because it would have to remember what it has sent to each of the UEs. They understand that the intention of P1 is already captured in stage 2.

CATT agree with the intention of P1, but we do not normally specify how the UE handles stored assistance data, and they do not see spec impact. For P3, they agree that it does not work; if the intention is to reduce latency, they think broadcast works.

Huawei understand that the previous RAN2 agreement was for a new instance when the UE receives a new PRS-ID; they think this is not correct, because the validity area is configured by a list of cells, not a list of PRS-IDs.

Ericsson understand the intention is to introduce a release list, and to match the release list we have to have the setup list; but they agree with others that the release list is not needed.

Apple wonder about the language “add” and “overwrite”; would we have to define variables?

Proposal2: The UE capability nr-dl-prs-AssistanceDataValidity reports the maximum number of validity area that defined by different combinations of cells.

Discussion:

Qualcomm think the current field description is OK. They agree in general that the validity area is a bit unclear, but they think the capability just indicates how many instances a UE can store. Huawei indicate that the issue is how you distinguish different instances for this purpose, and the point is to define a single instance by a combination of cells. Qualcomm thought this was defined already in stage 2.

To be checked offline in email discussion [405].

Proposal3: Add a list of validity areas in the PRS configuration to remove the pre-configured PRS configurations.

[R2-2211262](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211262%20Correction%20to%20UE%20capability%20for%20UE-based%20positioning.docx) Correction to UE capability for UE-based positioning Huawei, HiSilicon CR Rel-17 37.355 17.2.0 0387 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

OPPO think the UE can make the right decision already and no change is needed.

Intel understand the intention is correct, but the changes are written such that the UE would need to indicate these two bits even if it only supports UE-assisted DL-TDOA.

Qualcomm have the same view as OPPO; this is a UE capability and the UE sets the bits according to what it supports. They agree with Huawei’s interpretation of what would be supported in practice, but they think the UE implementation can do the right thing.

Ericsson agree with the other comments that the capability can be set properly by UE implementation. They also observe that this has been there since Rel-16 and do not see it as an essential correction.

Huawei can accept not taking the change, but to Intel’s comments, they think the “if the field is included” condition in the CR covers this case.

[R2-2211544](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\37355_CR0390_(Rel-17)_R2-2211544%20Corrections%20LPP%20caps.docx) Miscellaneous corrections to LPP capabilities Lenovo CR Rel-17 37.355 17.2.0 0390 - F NR\_pos\_enh-Core

Discussion:

Intel think change 1 is ok; they agree with the intention of change 2, but they think the change itself is NBC, and we should instead list the field for 27-15 separately as a precondition for 27-15a.

Qualcomm think the first change is a bit unclear; they think the whole affected NOTE should be deleted and does not trace to the feature spreadsheet in any clear way. Lenovo thought it was traceable to the feature list. Intel have the same understanding as Lenovo.

Lenovo also understand that there are updates to the RAN1 feature list that need to be captured in LPP.

To be checked in the LPP email discussion, with agreeable aspects to be merged into the CR.

[R2-2212234](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212234_(CR%2037355_PPW_Capability).docx) Correction to DL-PRS Processing Capability outside MG Qualcomm Incorporated draftCR Rel-17 37.355 17.2.0 F NR\_pos\_enh-Core

* Endorsed to be merged into the LPP rapporteur CR

Discussion:

Qualcomm understand that this CR obviates the previous CR from Lenovo.

To be merged into the rapporteur CR (detailed wording can be checked offline).

Integrity parameters

[R2-2212892](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212892%20integrity.docx) Integrity measurements definition and missing integrity requirements Ericsson discussion Rel-17

* Noted

Proposal 1 Update the definition of PL and achievable TIR is stage 2 specifications as in the text proposal in Appendix A.

Proposal 2 Add TIR, AL and TTA to the integrity assistance data to make UE-based integrity complete

Proposal 3 Define in TIR, AL and TTA field descriptions that these are mandatory to use for integrity reliability determination if the device has indicated a corresponding capability or has requested for TIR, AL and TTA as part of the assistance data.

Proposal 4 Agree to the 37.355 text proposal in Appendix B to make UE-based integrity complete

Discussion:

Qualcomm wonder what is wrong with the existing specification. They consider that the PL definition has been stable for more than 20 years in GPS, and we have previously discussed and concluded that the UE does not need AL and TTA.

Huawei think if P2 is for UE-based immediate MT-LR, the values come from the service layer.

Ericsson agree that the definition of PL is long-standing, but they think it is not suitable as a definition of what the device shall report, and the intention is to have a clear requirement on what the device shall report to the network. They think the currently defined behaviour to provide PL is not unambiguously testable.

Xiaomi agree with the intention of P2, and they think that without this assistance data, the definition is somewhat up to UE implementation.

OPPO agree that the TIR should be sent to the UE to compute the PL, but regarding AL and TTA, they do not think they are needed; if they are sent to the UE, then the UE needs to implement mode 2 integrity, which was excluded from this release.

Swift agree with Qualcomm on P1 and think we should stick to the industry standard definition; they also think the proposed definition is not necessarily usable. For P2, they are sympathetic to sending the values to the UE, but they think it should be part of the location request rather than the assistance data, and this proposal seems like a new use case.

CATT agree with Qualcomm and Swift on P1; they would like to avoid new parameters in stage 2.

Ericsson think there is a relation to modes 1 and 2, and we could discuss a bit further offline to clarify.

Qualcomm think this is not a needed correction in Rel-17; in general, they think Ericsson’s view of integrity is associated with the location estimate rather than system availability.

### 6.11.4 MAC corrections

Corrections to 38.321.

PPW configuration

[R2-2211545](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211545_Discussion%20PPW%20configuration.doc) Discussion on the configuration of PPWs Lenovo discussion Rel-17 NR\_pos\_enh-Core

* Noted

Discussion:

Huawei think the MAC CR does not restrict the RRC configuration; they understand that Lenovo’s example 3 is possible. Lenovo wonder then why we need the clarification in MAC about ascending order; Huawei indicate the reason is that there are only 2 bits for the ID, and there is no direct correspondence between the PPW ID and the four possible settings. Intel agree with Huawei. Samsung also have the same understanding as Huawei; the entries can be indexed in the order of their PPW ID.

ZTE think without the increasing order wording, the PPW configuration in the MAC can work, so they support Lenovo’s interpretation; they see no problem with removing the wording and just clarifying that the MAC ID is not the RRC ID for the PPW.

vivo have the same understanding as Huawei that the sentence cannot be removed.

Ericsson think Lenovo’s intention is not to remove the sentence but to clarify the different interpretations. However, they thought example 3 was extreme and there might be some ambiguity if we allow it.

Lenovo indicate that they do intend to remove the “increasing order” language and allow more flexibility. They think if a majority of companies want to keep the language, we have a relatively strict requirement on the network to ensure this behaviour according to examples 1 and 2.

Huawei indicate that the MAC does not restrict the RRC configuration, only indicates a correspondence between the MAC ID values and the RRC configuration.

CATT agree with Huawei and do not think there is an issue between gNB and UE.

Ericsson also think the increasing order is needed.

Optionality of MG activation/deactivation MAC CE (related to RRC discussion)

[R2-2211260](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211260%20Correction%20to%20MAC%20spec%20for%20pre-configured%20MG%20request.docx) Correction to MAC spec for pre-configured MG request Huawei, HiSilicon CR Rel-17 38.321 17.2.0 1450 - F NR\_pos\_enh-Core

[R2-2212357](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212357%20MACCR.docx) Positioning Measurement Gap Activation/Deactivation Request MAC CE based upon Network Configuration Ericsson CR Rel-17 38.321 17.2.0 1489 - F NR\_pos\_enh-Core

### 6.11.5 UE capabilities

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

[R2-2211546](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\38306_CRxxxx_(Rel-17)_R2-2211546%20Corrections%20PRS%20processing%20window%20caps.docx) Corrections to PRS processing window capability descriptions Lenovo draftCR Rel-17 38.306 17.2.0 F NR\_pos\_enh-Core

* Endorsed for merge into the mega CR

[R2-2212646](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212646%20draftCR_clarification%20on%20the%20support%20of%20DL-PRS%20Rx%20with%20higher%20SCS%20in%20FR2-2.docx) Clarification on the support of DL-PRS reception with 480/960 kHz SCS in FR2-2 Samsung draftCR Rel-17 38.306 17.2.0 NR\_pos\_enh-Core

* Not pursued

[R2-2211506](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211506%20-%20Corrections%20to%2038306%20CR0830%20for%2071GHz.docx) Correction to 38.306 for 71 GHz Ericsson CR Rel-17 38.306 17.2.0 0830 - F NR\_ext\_to\_71GHz-Core

* Not pursued

Discussion (joint discussion of the above two documents):

Samsung understand that there is no agreement on the complete list of reference signals in RAN1, and RAN2 should not take the step of listing them explicitly. They think the list can be further discussed in the 71 GHz session.

Ericsson agree with Samsung’s intention, but they think we normally specify what is supported, not what is not supported. They could accept sending an LS to RAN1 for clarification.

Intel understand that RAN1 only agreed on DL-PRS, and so far we have not provided for the network to indicate 480 kHz/960 kHz in LPP, so it is natural that the network cannot configure them; they see no need to update the UE capability for something that we cannot signal.

Nokia think if we have to capture something, the NOTE style is preferable; they think the Ericsson CR goes beyond the positioning scope. They also see that the RAN1 LS does not look promising for SRS, and they think we could capture that SRS is not supported either.

Lenovo prefer Ericsson’s approach, and they think there may be an alternative to listing all the signals explicitly, e.g., saying “all reference signals other than PRS”.

Qualcomm agree with Intel that we do not need to capture anything; the assistance data for these SCSs cannot be signalled anyway. If anything is captured, they think it should be an informative NOTE, not the normative NOTE in the table.

Huawei agree with Intel and Qualcomm; they also note that PRS is configured by LPP, and they think it does not make sense to refer to the capability in RRC.

Intel have the same view as Huawei that since the LMF configures the PRS, the NOTE in 38.306 is not helpful.

Nokia think an informative NOTE is fine, but they do think the RAN1 decision should be captured somewhere.

Ericsson think it is OK not to capture anything, and if we do something, it should be in a proper direction. They also understand that RAN1 have captured this decision in their specs already. They also agree with Huawei that 38.306 may not be the right place to specify something for PRS.

Samsung also understand the view of Qualcomm/Huawei/Intel, and if there is a majority view not to capture anything, they can accept that; however, they want to point out that the current description in the UE capability is not correct, because it says all reference signals can be supported at the UE side.

# 8 Rel-18

## 8.2 Expanded and improved NR positioning

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

Time budget: 2 TU

Tdoc Limitation: 4 tdocs

### 8.2.1 Organizational

Including incoming LSs and rapporteur inputs.

Open issue list

[R2-2211223](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211223%20Open%20Issue%20List%20of%20Study%20Item%20on%20Expanded%20and%20Improved%20NR%20Positioning.docx) Open Issue List of Study Item on Expanded and Improved NR Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

* Noted

Discussion:

CATT want to clarify that the document reflects our discussions/agreements up to this point, and they find a concentration of the open issues in sidelink positioning.

Intel understand that there are no blocking issues in RAN2 to SI completion; these items can be resolved in WI phase.

Incoming LSs

[R2-2211130](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211130_S2-2209590.docx) LS Out on Positioning Reference Units (S2-2209590; contact: CATT) SA2 LS in Rel-18 FS\_eLCS\_Ph3 To:RAN1 Cc:RAN2, RAN3

* Noted

Discussion:

Nokia think the questions in the LS imply that SA2’s conclusion is dependent on further input from RAN, and with RAN1 focussing on carrier phase positioning, they wonder if the input from RAN is critical.

CATT understand that SA2 have concluded on the principle but have some dependencies on RAN1; they think we can wait for progress in RAN1 and SA2.

Apple agree with CATT that we do not immediately need to do anything in RAN2. Intel and OPPO also agree with CATT.

Nokia are OK with waiting for RAN1, but they think we should reserve the right to send them some information during the WI phase.

Intel understand that the question is for RAN1, and we were deadlocked on this issue in Rel-17; they agree we need a decision from RAN1. If RAN1 conclude to support it, of course RAN2 will work on it.

[R2-2211131](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211131_S2-2209591.docx) LS on LPHAP information delivery to RAN (S2-2209591; contact: Huawei) SA2 LS in Rel-18 FS\_eLCS\_Ph3 To:RAN1, RAN2 Cc:RAN3

* [AT120][416][POS] Reply LS to SA2 on LPHAP information delivery to RAN (Huawei)

Scope: Draft a reply to the LS in R2-2211131, taking into account discussions under the LPHAP agenda item.

Intended outcome: Approvable LS

Deadline: Thursday 2022-11-17 1800

R2-2213140 Draft Reply LS on LPHAP information delivery to RAN Huawei, HiSilicon LS out Rel-18 FS\_eLCS\_Ph3 To:SA2 Cc:RAN1, RAN3

[R2-2211139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211139_S2-2209961.docx) LS on RAN dependency for Ranging/Sidelink Positioning (S2-2209961; contact: Xiaomi) SA2 LS in Rel-18 FS\_Ranging\_SL To:RAN1, RAN2, RAN3

Discussion:

Huawei note that this LS went to RAN1, RAN2, and RAN3, and it is not exactly clear which questions RAN2 should address. Xiaomi understand at least 1-5 and 7 can be discussed in RAN2, and 6 is related to RAN1; everything but 6 could be discussed here.

Lenovo think there may be too many questions to digest and we may need to do some prioritisation. They think Q1 may be the most controversial one. We can communicate with SA2 what we can conclude this meeting, and other topics may need to be deferred to February.

CATT understand SA2 are waiting for this LS for their January meeting, so they agree we need to send it this meeting, incorporating what we can conclude so far; unconcluded items can go to normative work.

Intel agree with others, first that it is difficult to conclude all items (e.g., server functionality and detailed parameters), and second that we need to provide what we can answer for now.

Apple wonder if we should try to address all the questions or only the ones for which we have contributions submitted. Xiaomi think all the questions are addressed in papers.

Ericsson think the scope will be a little clearer once we have discussed the sidelink topic.

OPPO think some of the questions should be discussed in this meeting.

Lenovo think issue 6 on resource coordination requires RAN1 lead.

* [AT120][417][POS] LS to SA2 on RAN dependencies in sidelink positioning (Xiaomi)

Scope: Discuss (f2f in breakout room 1) the questions from the LS in R2-2211139, taking into account conclusions of the online session on sidelink positioning, and start to draft a reply.

Intended outcome: Report to CB session in R2-2213130 and draft LS in R2-2213131

Deadline: Wednesday 2022-11-16 1800

[R2-2213130](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213130%20Report%20of%20offline%20discussion%20on%20reply%20LS%20on%20RAN%20dependency.doc) Report of offline discussion on reply LS on RAN dependency Xiaomi discussion Rel-18

Agreements:

Proposal 1: For the transport layer of SLPP, RAN2 agrees to down select between PDCP and PC5-U. And tell SA2 that we have not decided which options to take. More discussion is needed.

Proposal 2: Ask SA2 about the meaning of QoS parameters for Service Authorization, i.e. whether it is LCS QoS information or PQI like QoS.

Proposal 3: Tell SA2 that RAN2 has not decided to support assistant UE, and has not decided whether there is RAN2 impact or not.

Proposal 4: Tell SA2 that RAN2 has not discussed the discovery procedure, and leaves the issue to normative work if in scope.

Proposal 5: Inform SA2 the agreement RAN2 made regarding protocol options between UE and LMF, and tell SA2 that extension of LPP is also feasible to allow UE to support only the extension.

Proposal 6: Tell SA2 that the issue of how Resource coordination and scheduling is performed is out of RAN2 scope, and should be addressed by RAN1.

Proposal 7: Tell SA2 that, for out-of-coverage scenario, the functionalities of method determination, assistant data distribution and anchor UE selection can be performed by SL positioning server UE.

[R2-2213131](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213131%20Reply%20LS%20on%20RAN%20dependency%20for%20Ranging%20&%20Sidelink%20Positioning.docx) Reply LS on RAN dependency for Ranging & Sidelink Positioning RAN2 LS out Rel-18 To:SA2 Cc:RAN1, RAN3

* Approved

[R2-2211145](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211145_R1-2210567.docx) Reply LS on Terminology Alignment for Ranging/Sidelink Positioning (R1-2210567; contact: Xiaomi) RAN1 LS in Rel-18 FS\_Ranging\_SL To:SA2 Cc:RAN2, RAN3

* Noted

PRUs (related to R2-2211130)

[R2-2211222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211222%20Discussion%20on%20the%20PRU%20LS%20from%20SA2.docx) Discussion on the PRU LS from SA2 CATT discussion Rel-18 FS\_NR\_pos\_enh2

LPHAP (related to R2-2211131)

[R2-2211253](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211253%20Draft%20reply%20to%20SA2%20LS%20on%20LPHAP%20indication_final.doc) Discusison on the reply to SA2 LS on LPHAP Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

Sidelink positioning (related to R2-2211139)

[R2-2211758](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211758%20Discussion%20on%20reply%20LS%20on%20RAN%20dependency%20for%20Ranging%20Sidelink%20Positioning.doc) Discussion on reply LS on RAN dependency for Ranging Sidelink Positioning OPPO discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212179](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212179%20%5bdraft%5d%20Response%20LS%20to%20SA2%20on%20the%20Ranging%20and%20Sidelink%20positioning.docx) [Draft] Response LS to SA2 on the Ranging and Sidelink positioning Spreadtrum Communications LS out Rel-18 FS\_NR\_pos\_enh2 To:SA WG2 Cc:RAN WG1, RAN WG3

[R2-2212809](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212809%20Discussion%20on%20LS%20from%20SA2%20on%20RAN%20dependency.doc) Discussion on LS from SA2 on RAN dependency Xiaomi discussion Rel-18

[R2-2212810](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212810%20Draft%20Reply%20LS%20on%20RAN%20dependency%20for%20Ranging%20&%20Sidelink%20Positioning.docx) Draft Reply LS on RAN dependency for Ranging & Sidelink Positioning Xiaomi LS out Rel-18 To:SA2 Cc:RAN1, RAN3

[R2-2212856](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212856_(Reply%20LS%20on%20RAN%20dependency%20for%20Ranging-Sidelink%20Positioning).docx) RAN dependency for Ranging/Sidelink Positioning Qualcomm Incorporated discussion

TP to TR 38.859

[R2-2211224](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211224%20Text%20Proposals%20of%20TR%2038.859%20for%20Expanded%20and%20Improved%20NR%20Positioning.docx) Text Proposals of TR 38.859 for Expanded and Improved NR Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211225](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211225%20draft%20LS%20to%20capture%20Text%20Proposal%20for%20TR%2038.859.doc) draft LS to capture Text Proposal for TR 38.859 CATT LS out Rel-18 FS\_NR\_pos\_enh2 To:RAN 1 Cc:RAN3

* [AT120][418][POS] TP to TR 38.859 (CATT)

Scope: Check the TP in R2-2211224 and update it with decisions of this meeting.

Intended outcome: Endorsable TP in R2-2213141

Deadline: Wednesday 2022-11-16 1800

[R2-2213148](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213148%20Summary%20of%20%5bAT120%5d%5b418%5d%5bPOS%5d%20TP%20to%20TR%2038.859%20(CATT)_v07_Rapp.docx) Summary of [AT120][418][POS] TP to TR 38.859 (CATT) CATT discussion Rel-18 FS\_NR\_pos\_enh2

* Noted

[R2-2213141](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213141%20Text%20Proposals%20of%20TR%2038.859%20for%20Expanded%20and%20Improved%20NR%20Positioning.docx) Text Proposals of TR 38.859 for Expanded and Improved NR Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

* Endorsed as a baseline for further updates
* Revised in R2-2213154

Discussion:

CATT clarify the TP needs an update for the decisions of today.

Intel think we should capture the recommendations as explicit agreements. CATT think we can further check the recommendations in the TP.

### 8.2.2 Sidelink positioning

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

AI summary

[R2-2213118](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213118%20Summary%20of%20AI%208.2.2%20SL%20positioning.docx) Summary of agenda item 8.2.2 on sidelink positioning (CATT) CATT discussion Rel-18 FS\_NR\_pos\_enh2

Discussion:

CATT clarify that the summary omits the discussion on the LS from SA2.

Easy agreed

Proposal 1 Abbreviation of SLPP is used as the name of new protocol for sidelink positioning between UEs and inform other WGs, i.e. SA2 and RAN1:

- SLPP: Sidelink Positioning Protocol

Proposal 2 RAN2 to confirm either of UEs, except not all UEs, including target UE and one or multiple anchor UEs may be OOC in partial coverage scenarios. How to enable the procedures/signaling for supporting SL positioning in partial coverage will be further discussed in normative work.

Proposal 9 RAN2 to enable the support of SL-PRS configuration in normative work based on the progress in RAN1.

Proposal 12 RAN2 to discuss the details of functionalities of LMF for supporting SL positioning in normative work.

Discussion:

On P1, Qualcomm think we can decide the name during stage 3 work. They have some doubts about the SA2 terminology but think this is not an urgent issue.

ZTE are fine with the SLPP name, because ranging is conceptually included in “sidelink positioning”.

Chair suggests we may need a name to use in the TP.

Intel prefer SLPP and think we may need a conclusion for WI creation.

Ericsson think there is an acronym collision with SLPP in SA2, and maybe we should check with them.

Qualcomm think we have only agreed to create a separate ASN.1 module, not a new spec, so the name may not be needed for the WID. Intel think we would need to indicate affected specifications in the WID, and if we introduce a new spec it would need a name.

Ericsson suggest SPP.

Lenovo prefer SLPP; they think the RSPP name wrongly suggests that ranging is not encapsulated within sidelink. CMCC also support SLPP.

On P2, ZTE think the wording “except not all UEs” is a bit unclear and may not be necessary.

Intel think we could say “at least one UE should be in coverage” for partial coverage.

Philips think if one UE has to be in coverage, we should clarify if it has to be an anchor UE; they think it would be OOC if all anchors are OOC. Huawei think the intention is that any one UE (target and/or anchors) has to be in coverage.

OPPO think we can further discuss if the LMF or a server UE is involved in PC scenarios, case by case.

Nokia have a similar view to OPPO and think the role of the LMF should be understood.

Ericsson think we can discuss the role of the LMF and coverage of the anchor UEs in normative work, but the important thing here is that at least one UE is in coverage.

On P9, ZTE think RAN2 can discuss the assistance data transfer, and they wonder if the SL-PRS configuration and the AD transfer work in parallel or if we design the AD transfer including the SL-PRS configuration, similar to LPP.

CATT think the experience of Rel-16 was that RAN1 designed the parameters of the reference signals and RAN2 designed how to configure the allocation to the target UE or other device. So they think that RAN2 can further discuss the configuration signalling in normative work.

Ericsson agree with CATT that we can wait for RAN1.

Xiaomi wonder if this means we will not discuss the server UE functionality related to resource coordination and allocation.

Intel can live with P9, but want to be clear that we still discuss the related server UE functionality in the offline.

Ericsson agree with Intel and think the resource coordination and allocation are up to RAN1.

On P12, Intel agree it can be discussed in normative work.

OPPO wonder if we should include the server UE in P2; the details of the server UE functionality may not be clear in PC cases.

CATT think the server UE should be discussed in the offline discussion of the issues from the SA2 LS.

Agreements:

Proposal 1 (modified) Abbreviation of SLPP is used as the working name of new protocol for sidelink positioning between UEs at least for RAN2’s TP to TR 38.859, and inform other WGs, i.e. SA2 and RAN1:

- SLPP: Sidelink Positioning Protocol

Proposal 2 (modified) RAN2 to confirm either of UEs including target UE and one or multiple anchor UEs may be OOC in partial coverage scenarios, but with at least one UE being in coverage. How to enable the procedures/signaling for supporting SL positioning in partial coverage will be further discussed in normative work.

Proposal 9 RAN2 to enable the support of SL-PRS configuration in normative work based on the progress in RAN1.

Proposal 12 RAN2 to discuss the details of functionalities of LMF for supporting SL positioning in normative work.

groupcast/broadcast aspect:

Proposal 13 RAN2 to confirm the applicability of at least the following positioning signaling for groupcast/broadcast (in addition to unicast):

• SL positioning capability (5)

• SL positioning assistance data (6)

Discussion:

Apple have no big concern on the proposal but think we may need to clarify what “applicability” means exactly.

Qualcomm wonder about the location information transfer and think we could capture it to be discussed in the WI phase.

Xiaomi wonder if the proposal applies only to group positioning or non-group positioning. They also think some capability could be transferred in the discovery procedure and wonder if the proposal refers only to SLPP signalling.

Intel think this was discussed previously and they are not sure if there is any new progress. For example, they think security for the capability could be a concern, and the details of the use case may not be clear.

CATT have a concern on distributing the capability by broadcast or groupcast without security, so they would like SA3 to look at this.

InterDigital have the same view as Qualcomm and Intel and think we should not preclude location information signalling; without information from SA3, they are not sure if we should exclude it, and in general they think we need SA3 input on what can be transmitted without security.

OPPO agree with CATT that SA3 input is needed.

Qualcomm think we should specify clearly what we mean by “security”. In some cases they understand that it means privacy, but they are not sure there is a privacy issue.

CMCC agree with the proposal in general but think we can revise the agreement if there is a security issue. They have a similar question to CATT regarding exactly what is included in capability.

Lenovo share CATT’s concern and think we had this issue raised in past agreements; it may be too late for SA3 feedback to the study, but we could indicate feasibility from RAN2 perspective. They understand that security relates to integrity and ciphering, both of which are applied on posSIBs.

Apple think we can confirm the feasibility from RAN2 perspective, but they wonder how we are going to resolve the security issue.

Nokia think we could add an FFS in the agreement on exactly what information would need to be protected.

CATT think we need to be clear with SA3 on what information and what procedures need to be checked. Huawei agree; in the current stage of the SI it might be too early to send a useful LS.

Huawei think groupcast/broadcast are an optimisation and unicast should always be the baseline.

Xiaomi wonder if an LS could also be sent to SA2 asking about their intention to support group positioning.

Intel understand that the security aspect was already mentioned in the SA2 LS, so the problem is already under consideration; they assume SA2 will also check with SA3. They think we need to identify the use case that calls for groupcast/broadcast. They do not see the need for a RAN2 LS to SA3.

Qualcomm think RAN2 have taken an agreement that unicast is the baseline, and it seems reasonable to ask SA3 about security aspects as well as asking SA2 about group positioning.

Apple think it is strange that we have security concerns but also concerns with asking SA3.

Lenovo think from RAN perspective, there is a key dependency of groupcast/broadcast on the kind of positioning techniques that are configured, e.g., requirement for multiple anchor UEs.

CATT think P13 is not necessarily related to group positioning; for instance, in DL-TDOA-like positioning, it would be possible to broadcast capability, AD, or even location information, from RAN2 perspective; so they would like to ask SA3 if it is possible to deliver this information without protection.

Nokia see the security issue as a dependency for RAN2, and they think we would benefit from information on what is reasonable on SA3 side.

Qualcomm are not sure why this is a difficult issue; we have security for the posSIBs, and we could do something similar here, but we need to determine whether the use cases and security requirements call for it.

OPPO support sending an LS to SA3; they think we need to resolve possible future concerns about security instead of repeating discussions.

Intel would not object to sending the LS, but they think the root issue is that companies have different understandings on the procedures and architecture. For instance, if we do not know which node will send a message to whom with what content, how can SA3 evaluate?

Lenovo indicate that RAN1 agreed to look at SL-TDOA (DL-like or UL-like), and in this case they see that there might be a need to groupcast the assistance data. Intel think this relates more to SL-PRS transmission.

CATT think for the specific information on the capability, it is clear that RF-related information and other information about PHY/MAC should not be broadcasted because it should be protected.

Agreements:

Proposal 13 (modified) RAN2 confirm that from RAN2 perspective, it is feasible to send at least the following positioning signaling for groupcast/broadcast (in addition to unicast):

• SL positioning capability (5)

• SL positioning assistance data (6)

Location information is not excluded and can be further considered in normative work.

Proposal 14 (modified) RAN2 to further discuss in normative work:

- the security issues (e.g., requirements for ciphering and/or integrity) on specific information of SL positioning capability and assistance data in groupcast/broadcast and consult to SA2 and SA3.

- the use cases for applying groupcast/broadcast.

LS to SA2/SA3 to indicate the agreement, that we are aware of SA2’s security concern, and inquire what security constraints would apply to transmission of SL positioning capability and distribution of assistance data by groupcast/broadcast. Inquire of SA2 if they have identified groupcast/broadcast use cases.

* [AT120][419][POS] LS to SA2/SA3 on sidelink positioning groupcast and broadcast (Apple)

Scope: Draft an LS indicating to SA2/SA3 the agreements from P13/P14 of R2-2213118 and requesting their views.

Intended outcome: Approvable LS in R2-2213142

Deadline: Thursday 2022-11-17 1800

Proposal 14 RAN2 to further discuss in normative work:

- the security issues on specific information of SL positioning capability and assistance data in groupcast/broadcast and consult to SA2 and SA3.

- the use cases for applying groupcast/broadcast.

To be discussed

Architecture aspect:

Proposal 3 RAN2 to discuss SL positioning architecture, including whether UE roles(target UE/ Anchor UE/ Server UE) are specified in SL positioning architecture, whether LTE PC5 is excluded for SL positioning.

Discussion:

Samsung prefer not to specify all the UE roles in the architecture; there are many UE roles and they think it will be simple and clear not to include them all. They understand that RAN1 are already designing new reference signals, so if we want to support SL positioning on LTE PC5, we would need new reference signals there as well, which seems out of scope of the SI and would need RAN1 discussion.

Ericsson agree with Samsung that the architecture should not capture the UE roles but should just show UEs, with the understanding that they may take different roles. They also agree that LTE PC5 should be discussed in RAN1.

Qualcomm agree that we should follow the SA2 architecture, which shows only a UE. On LTE PC5, they think the question is about transport of SLPP, not SL-PRS.

Intel wonder if the positioning architecture is related to the SA2 questions about the anchor UE and the server UE. On LTE PC5, they share the view with Samsung but think that RAN1 are better positioned to answer.

Huawei agree with others that from RAN perspective there are only two roles, target and anchor, and we do not need to introduce others in the architecture; for LTE PC5, they think the discussion should be separated between transmission of SL-PRS and transmission of signalling, with the first being a RAN1 issue and the second being related to our groupcast/broadcast discussion, since LTE PC5 is only used for broadcast.

Xiaomi think we can adopt a similar strategy to SA2, with the roles identified in a NOTE but not in the figure. They agree with Qualcomm that from RAN2 pov, we can discuss whether it should be supported for message transport.

vivo think the SID is specific to NR sidelink and LTE PC5 is not included.

OPPO think it is strange not to elaborate the UE roles in the architecture, especially the server UE.

Lenovo think if the UE roles are not captured, it is not clear how we capture the in-coverage scenario where there is a dependency on the LMF, vs. the OOC scenario where there may be a dependency on the server UE. On LTE PC5, they think this interacts with the RAN1 coexistence discussion.

Qualcomm think the signalling is independent of the SL-PRS, and there is no need to preclude LTE PC5.

Intel think we could confirm the intention to follow SA2 in architecture design.

Intel indicate that the WID only mentions NR sidelink as a related WI/dependency.

Apple support excluding LTE PC5.

Agreements:

UE roles are not captured in the diagram of the positioning architecture. Can discuss in normative work if some information is needed in stage 2 in association with the architecture (e.g., a NOTE with the figure).

RAN2 confirm the intention to follow SA2 architecture design.

RAN2 will not work on LTE PC5 in the study item. RAN2 leave it to RAN to determine if LTE PC5 is in scope of a future WI.

Session-based and session-less aspect:

Proposal 4 RAN2 to confirm that a positioning session is characterized by a time-limited two-way link enabling interactive expression and information exchange between two or more communication devices, typically in presence of state (ie, information about session history).

Discussion:

Xiaomi do not understand why the time concept is there; it is not in LPP. Nokia clarify that it means a session should have a start and an end.

vivo think the session-related topics are in SA scope and we did not have this kind of discussion for LPP. They would prefer to leave it to SA side.

ZTE agree with vivo, but if we want to specify something in RAN2, they think a positioning session should be associated with a service request (e.g., MT-LR or MO-LR) as in LPP. For the time limitation, they think we should not specify a QoS-related requirement in the definition.

Qualcomm indicate that the proposal just specifies what session-based means, not which group specifies it. They do not think that the LPP model is suitable for sidelink; there is no LPP “session” visibility.

Ericsson agree with ZTE and vivo. In the CN there is a session management function outside our scope, and they think this is in SA2 scope.

Nokia intend to establish a fundamental approach to the design of a session.

Intel understand that the AMF manages the positioning session based on the service request.

Xiaomi understand that we have some concept of a session in the LPP specification, but they think we could remove the time-limited aspect.

Qualcomm think Intel’s comment is exactly why we need to think about the positioning session: We do not have an AMF that manages the sidelink. They understand that in LPP, the transactions all belong to one session, and they think this is a valid definition.

Lenovo think it would be useful to define the session, and they agree with Qualcomm that something is needed because the AMF is not involved.

CATT indicate that there is an LPP session definition that can be reused. Chair points out we do not know what the equivalent of an LCS operation is.

Ericsson think the LPP session concept is a baseline for IC and PC, but OOC needs to be addressed.

Apple think there is not a real definition of an LPP session; it is mentioned but not really defined. They think at most we can say what is implied by session-based, and we may not be able to go much further with sessionless.

Qualcomm wonder what the SLPP session would be for OOC; would the LMF speak SLPP to a UE OOC? They think the service layer notion is not applicable to sidelink.

CATT think from SA2 perspective, the UE can provide location service, so it seems reasonable in SL positioning that the UE can provide its service to others in an MT-LR-type operation between two devices, so they think SA2 can design a service request between devices for OOC operation.

Ericsson think we should discuss session-based and sessionless together. They also think we could indicate to SA2 that RAN2 see the need of some session concept and would like their guidance.

Huawei wonder about the formulation “signalling of a session can be associated”; does it mean a UE can support multiple ongoing sessions? Otherwise they see no need to signal a session ID.

ZTE think there could be multiple sessions, as there can for LPP when a UE has multiple service requests. To Ericsson’s comment, they think the session-based is a baseline that we have agreed before.

Nokia wonder if we could also capture the need to study the functionality associated with a session-based or sessionless mode; what is different between them?

Apple are fine with the proposed language; with respect to sessionless, they think that some positioning methods like single-sided RTT might not require a session; e.g., all that is needed might be assistance data provided by broadcast.

Qualcomm agree with Apple and think session-based/sessionless is an important distinction.

Agreement:

Sidelink positioning supports a session-based concept in SLPP, in which signalling messages within a session can be associated with one another by the involved UEs. The relationship to upper-layer designs from SA2 can be discussed during normative work.

FFS if there is also sessionless operation and what aspects of session-based operation would not be included.

Proposal 5 RAN2 to discuss if the session modification (adding or removing UEs to a session) is supported or not in session-based.

Proposal 6 RAN2 to discuss if session-less positioning is anything else than session-based positioning as per Proposal 5 (if agreed)”, or session-less positioning is best-effort positioning without QoS guarantees, FFS other necessary and satisfactory characteristics for its definition, including security and integrity.

Proposal 7 RAN2 to discuss the scenarios where the session-less SL positioning are applicable, including:

- at least for some positioning methods (e.g. single-sided RTT)

- If security is not required, session-less is applicable.

- SLPP should support session-less operation to enable sidelink positioning with no discovery, no UE associations and no SLPP session.

Discussion:

Nokia think there is a clear need to distinguish session-based and sessionless depending on the method used.

Huawei think single-sided RTT might be a use case, but they are not sure that RAN1 have concluded to support it. Apple think RAN1 may not have concluded on any specific methods. Lenovo think SL-TDOA, SL-AoA, and SL-RTT solutions are agreed in RAN1.

Apple indicate that single-sided RTT is in the RAN1 study, which, however, is still open.

Huawei think if it is open in RAN1, we should continue the discussion in the WI phase.

Xiaomi think sessionless is not related to a positioning method, but only to the case where there is no need to exchange messages among UEs.

Intel wonder if there is a similarity to UE-based positioning; they see the sessionless concept as somewhat similar to the case where the UE does UE-based positioning based on broadcast assistance data, without a connection to the network.

Apple agree with Intel’s point, and think we definitely want an equivalent of UE-based positioning.

OPPO think sessionless operation does not require the UE message exchange, but it is dependent on broadcast operation. They think the security aspect can be conditioned on the information we get from SA3.

Nokia think the presence of a session should imply certain benefits; there is overhead associated with running a session and we should know why we accept this overhead.

Intel have a similar view to Apple that saying “do not require security” is too strong.

Xiaomi agree with Intel.

Fraunhofer see that the sessionless operation could be similar to preconfigured assistance data on Uu.

vivo wonder if we are introducing a new concept of groupcast and broadcast.

Intel see no relationship between sessionless and groupcast/broadcast.

Agreement:

At least in the case that positioning methods are supported that do not require a mutual exchange of SLPP messages associated with one another among UEs, SLPP sessionless operation can be supported. FFS if sessionless operation can be operated with security.

Distributed mode of operation aspect:

Proposal 8 RAN2 to discuss whether SLPP should support distributed (or decentralized) mode of operation, where each of the participating UEs perform the range and/or position computations on their own (based on the exchanged location information) and FFS the need of session-based/session-less in normative work.

Discussion:

Ericsson think this is fundamental and should be the baseline.

OPPO think conventionally in LPP there is only one target UE involved, and every involved TRP should take measurements of the reference signals from the target UE and send measurement results towards the LMF; the operation is always in this sense centralised around the target UE. Here they wonder if multiple target UEs are considered, and also how to obtain the position result for one target UE of a group.

Lenovo think normally the UE that is calculating the position would receive a service request; does this imply multiple UEs receive a service request?

Xiaomi think this looks like group positioning with multiple calculation at different UEs.

Qualcomm generally agree with Ericsson’s comment; they see several advantages of distributed over centralised positioning, e.g., the ability to avoid blockages, signalling efficiency.

Intel think distributed operation should be supported, but it seems only applicable for OOC, where there is no central node with a natural role computing the location estimate. For other cases they do not see a need to depart from the legacy way.

Nokia are not sure we need to take the proposal, although they have some sympathy for the idea of multiple UEs being able to localise themselves in parallel.

Qualcomm think the normal sidelink use case is that you want the location of a group of UEs, e.g., the range between multiple vehicles at the same time. So if there is a centralised calculation function it would have to distribute the estimate to many UEs. They also agree that it is independent of session-based/sessionless.

Ericsson think it is independent of session-based/sessionless, and primarily for OOC.

CATT think it is necessary to have distributed operation, for example, for RTT ranging where there are only two devices. In such a case, each device can calculate the range without a centralised calculation function. A car might calculate its own range to the RSU and get an absolute location in a tunnel scenario.

Xiaomi think SA2 have not decided to support group positioning.

OPPO think this operation assumes the UEs involved are all target UEs. If the position of the anchor UEs is unknown, it is not clear how to derive the absolute position of a UE. They see this as a sort of new cooperative positioning method that should be discussed in RAN1.

ZTE think this proposal needs a condition that it is used only for certain cases like group positioning.

Philips understand that SA2 consider that in OOC cases, positioning is centralised around a server UE.

Ericsson wonder if we could say that it is possible to do ranging without a central entity.

Nokia wonder how this would differ from multiple parallel sessions. Qualcomm see benefits in signalling overhead.

Lenovo are not sure it should be preconditioned on group positioning, since we already have conditions like TDOA involving multiple UEs.

Ericsson think there could be multiple UEs doing the computation at the same time as transmitting and performing measurements. They do not see it as limited to group positioning.

Agreement:

From RAN2 perspective, if it is determined to support group positioning, it is feasible to perform at least ranging with the estimate calculation at multiple UEs.

Anchor UE (re)selection aspect:

Proposal 10 For anchor UE(s) (re)selection, AS layer criteria should be considered besides the high layer criteria.

Proposal 11 For anchor UE(s) (re)selection criteria, the following assistance data can be discussed:

- the intended positioning methods are supported by the UE;

- the UE is capable of being anchor UE;

- Serving cell ID.

- the UE is stationary/fixed (e.g. RSU/PRU) and/or mobile (e.g. vehicle).

- the UE is location known

More assistance data can be further discussed in normative work based on the progress including RAN1:

- travelling path.

- Battery status

- location accuracy.

- velocity and direction.

- dynamic measurements including signal strength measurements. FFS further details.

R2-2213142 Draft LS on SL positioning broadcast Apple LS out Rel-18 FS\_NR\_pos\_enh2 To:SA2, SA3

The following documents will not be individually treated

[R2-2211226](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211226%20Discussion%20on%20SL%20Positioning.docx) Discussion on SL Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211230](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211230%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211252](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211252%20Discussion%20on%20sidelink%20positioning_final.docx) Discussion on Sidelink Positioning Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211462](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211462.docx) Support of sidelink positioning Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211661](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211661.docx) Server UE functions MediaTek Inc. discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211688](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211688-SL-POS-v0.docx) SLPP/RSPP protocol design Apple discussion FS\_NR\_pos\_enh2

[R2-2211839](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211839%20Further%20discussion%20on%20sidelink%20positioning.docx) Further discussion on sidelink positioning OPPO discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211917](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211917_SL_Pos.docx) Considerations on sidelink positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212082](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212082_Sidelink-Fraunhofer.docx) Considerations for UE Positioning using Sidelink Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2212096](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212096_SLPos_Solutions.docx) On SL Positioning Protocol and Architecture Lenovo discussion Rel-18

[R2-2212109](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212109.docx) Discussion of session-based and session-less sidelink positioning Nokia Germany discussion Rel-18

[R2-2212112](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212112.docx) Protocol and coverage aspects of sidelink positioning Nokia Germany discussion

[R2-2212169](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212169%20Discussion%20on%20potential%20solutions%20for%20SL%20positioning.docx) Discussion on potential solutions for SL positioning Spreadtrum Communications discussion Rel-18

[R2-2212359](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212359%20SL.docx) NW Assisted Ranging and Protocol Name and terminologies Ericsson discussion Rel-18

[R2-2212470](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212470%20Study%20of%20signalling%20procedures%20and%20design%20considerations%20for%20sidelink%20positioning.docx) Study of signalling procedures and design considerations for sidelink positioning LG Electronics Deutschland discussion Rel-18

[R2-2212506](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212506%20(R18%20NR%20POS%20SI%20A822_SLPos).doc) Discussion on Sidelink Positioning InterDigital Communications discussion Rel-18

[R2-2212554](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212554.docx) Signaling procedures to enable sidelink positioning Sharp discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212647](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212647%20Discussion%20on%20SL-PRS%20resource%20allocation.docx) Discussion on SL-PRS resource allocation schemes Samsung discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212685](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212685%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning ZTE Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212710](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212710%20Considerations%20on%20Sidelink%20positioning.doc) Considerations on Sidelink positioning CMCC discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212811](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212811%20Discussion%20on%20SL%20positioning.doc) Discussion on SL positioning Xiaomi discussion Rel-18

[R2-2212857](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212857_(Sidelink%20Positioning).docx) Study of Sidelink Positioning Architecture, Signaling and Procedures Qualcomm Incorporated discussion

[R2-2212883](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212883%20(8.2.2)%20Discussion%20on%20SL-POS%20protocol%20architecture%20design.doc) Discussion on SL-POS protocol architecture design Samsung Electronics Romania discussion

[R2-2212941](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212941_Protocol%20considerations%20for%20sidelink%20positioning_clean.docx) Protocol considerations for sidelink positioning Philips International B.V. discussion Rel-18 38.859 FS\_NR\_pos\_enh2 Late

### 8.2.3 RAT-dependent integrity

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

AI summary

[R2-2213119](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213119%20%5bPre120%5d%5b404%5d%5bPOS%5d%20Summary%20of%20agenda%20item%208.2.3%20on%20RAT-dependent%20integrity.docx) [Pre120][404][POS] Summary of agenda item 8.2.3 on RAT-dependent integrity InterDigital Communications discussion Rel-18

* Revised in R2-2213127

[R2-2213127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213127%20%5bPre120%5d%5b404%5d%5bPOS%5d%20Summary%20of%20agenda%20item%208.2.3%20on%20RAT-dependent%20integrity.docx) [Pre120][404][POS] Summary of agenda item 8.2.3 on RAT-dependent integrity InterDigital Communications discussion Rel-18

Proposal 1: use DNU flag for RAT-dependent integrity

Discussion:

Huawei would like to clarify whether this case is possible. The LMF sends assistance data to the UE, containing a DNU flag, and if the DNU flag is set to true, the UE can still use the AD for positioning but not for integrity calculation. If this scenario is valid, they believe the DNU flag is useful, otherwise it may not be needed.

Qualcomm think Huawei’s use case is one case but not necessarily the typical one. They assume the LMF sends only “healthy” assistance data to the UE, but in between assistance data updates, an event could happen that makes a TP not suitable for positioning calculations, and the UE needs to be informed that the existing assistance data is not suitable any more.

Intel wonder why the network would not just update the assistance data if this happens.

CATT have the same concern as Intel, and they want to understand the intention of the DNU flag: Do not use for what? If it is for positioning calculation, the network can also update that assistance data.

vivo see a slight majority to prefer the flag, but with varying reasons; they agree with CATT and Intel that the network can just update the assistance data.

Nokia think we did not discuss use cases for the DNU flag for RAT-independent integrity, and we agreed to follow the same principles; we have the concept of an integrity alert, and if we are going to follow the RAT-independent principles, it make sense to have the flag.

Qualcomm agree with Nokia; the DNU flags define the time to alert, so without them, we would need a new integrity concept with a new definition of TTA.

Ericsson think the same example from RAT-independent is valid: The DNU flag can indicate that a source is not to be used for integrity. This need cannot be met by not providing assistance data.

InterDigital think Huawei asked the right question: If there is a case where we can compute location with a DNU flag set, then the DNU has to be used. For example, if the TRP location is broken, a DNU flag could be useful. They see these as the only reasons.

ZTE want to confirm Huawei’s understanding; they think this case is valid and have the intention to split the DNU calculation and the positioning calculation. They see it as useful in case the network configures DL-PRS to the UE in a large validity area and needs to invalidate certain TRPs. They think we should have an FFS to support separate DNU flags in the UL and DL directions.

OPPO think if the TRP measurement is not good, the UE can monitor it based on the measurement results. For the TRP location information, the network can just update the assistance data. So they think the DNU flag may not be necessary.

CATT think in RAT-independent positioning, the LMF cannot update the assistance data itself because it comes from another entity, so the DNU flag makes sense; but in the RAT-dependent case, the LMF controls everything. Ericsson think the DNU flag is needed to validate whether the assistance data can be used for integrity or only for positioning.

Intel wonder if we can trust the result in this case.

ESA indicate that the position itself may still be useful, but what is missing is the measurement of the trust that you can put in that location; you do not have a certain TIR that you meet.

Lenovo support the use of DNU and think it helps in reusing the GNSS framework and providing an actionable procedure to control the integrity.

Xiaomi think the case for RAT-dependent positioning is different because the LMF controls the assistance data.

Comments related to Qualcomm’s comment on changing the integrity definition:

vivo think the DNU in the integrity definition is not related to the measurement or the assistance data, only to the result of the integrity.

Intel think if we do not use the DNU concept, it just means all of the assistance data would be considered not to have the DNU set for the definition.

Qualcomm think the RAT-independent case is not different from the RAT-dependent case, in the sense that the LMF still has to compute assistance data for the RAT-independent case, and they think we do not want different integrity algorithms for different cases. They point out the TTA is defined in terms of when a DNU flag has to be issued, so it cannot just be omitted as suggested by Intel. In case of something happening between assistance data updates, they think it may not be possible to update the assistance data within the TTA.

Nokia think we should have a common framework for integrity, rather than method-specific.

OPPO wonder if the network cannot update the assistance data in time, how it can send the DNU flag to the UE. Qualcomm understand it would be the same as GNSS, where the DNU update rate has to be set according to the TTA.

InterDigital assume the DNU flag can be placed on any parameters coming from the LMF, and they wonder if the affected parameter would always be recognised as an error source. Qualcomm think this depends on what RAN1 decide about the error sources; we may have one DNU flag for each error source, or a master “don’t use this TRP” flag.

CATT think based on the error sources identified so far in RAN1, we need the DNU.

ZTE think this is mainly about DL DNU, and they would like it clear that UL DNU is not precluded. They clarify that it means DNU flags signalled in the measurement report and sent to the LMF.

CATT do not observe a need for a DNU flag for the measurement report from gNB to LMF.

Nokia think this is our last main open issue, and if we can resolve this, we look at the uplink part as part of the normative work.

Huawei understand from RAN1’s study that they have agreed error sources exist in the TRP information report for uplink positioning, but there is no error source in the UE-assisted DL positioning.

Agreement:

Proposal 1 (modified): Use DNU flag for RAT-dependent integrity, with the meaning that the concerned assistance data cannot be used for integrity calculation but may be usable for positioning. Signalling details and relation to error sources can be determined in normative work. FFS which positioning methods are affected based on the progress in RAN1.

Proposal 2: UE sends capability info to LMF on integrity for the LMF-based integrity. Details of UE capabilities are discussed in the normative work.

Discussion:

Xiaomi think we may need new UE capabilities also for UE-based integrity.

Qualcomm think the proposal is not needed; we will anyway have capabilities wherever we need them when we introduce a new feature.

InterDigital think we just need to define the LMF-based procedure, and the intention is to capture this. Qualcomm do not see that we need a new procedure.

Lenovo think capabilities need to informed to the gNB as well.

InterDigital think we have a UE-based procedure already, and we need to follow a similar model for the LMF-based case.

Intel agree with InterDigital’s intention; they see that the LMF-based procedure is missing and we need to capture it.

Qualcomm think the procedure is just part of the measurement report: Provide Location Information including the new parameters that we add in stage 3, with no new procedures.

CATT indicate we have a UE-based procedure in the current TP, and it would be good to have an LMF-based version.

* [AT120][420][POS] LMF-based integrity procedure (InterDigital)

Scope: Develop a summary of the LMF-based integrity procedure, starting from P2/P3 of R2-2213127 and related discussion.

Intended outcome: Endorsable TP in R2-2213143 for merge into the TP being developed to 38.859

Deadline: Wednesday 2022-11-16 1800

Proposal 3: Remove steps 2a/2b from Figure 2, then Figures 1, 2 and 3 are updated with the UE capability signalling and the updated figures are captured in the TR as baseline. Exactly what messages are used are discussed in the normative work.

Proposal 4: Discuss integrity KPI/integrity results transfer procedures in normative work

Proposal 5: The mapping of integrity parameters should be handled by RAN1 instead of RAN2.

Proposal 6: RAN2 discuss the spec impact of RAT-dependent error sources based on the error sources found by RAN1.

Discussion:

CATT indicate the RAN1 error sources have been listed in the current TP along with LPP/NRPPa impact.

Proposal 7: Integrity alert output is performed when some defined integrity information or events are detected for both UE-based and LMF -based integrity modes.

Proposal 8: Support both Mode 1 (PL reporting) and Mode 2 (integrity flag reporting) reporting of integrity result for RAT-dependent positioning

Proposal 9: The position calculation and integrity calculation shall be performed at the same entity.

[R2-2213143](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213143%20%5bAT120%5d%5b420%5d%5bPOS%5d%20LMF-based%20integrity%20procedure%20(InterDigital).docx) [AT120][420][POS] LMF-based integrity procedure (InterDigital) InterDigital Communications discussion Rel-18

Discussion:

Ericsson think it is not the error sources as such that would be sent to the LMF, but “results related to integrity”.

Qualcomm think we are not sending error sources to the UE and LMF; the UE still sends measurements and some quality information, which could be called “integrity bounds” or something else. They wonder if we need to specify anything about procedures, since we would not introduce new procedures for integrity but use the existing LPP procedures with new parameters.

Intel think what we have here is aligned with what we previously agreed for UE-based integrity, and we need to agree something, irrespective of whether we call it procedures or signalling.

InterDigital have the same understanding as Intel.

Qualcomm think in UE-based, we don’t talk about moving error sources to the network.

Ericsson think the last note should be promoted to a fifth bullet, with “error sources” replaced by “results related to integrity”.

vivo think bullets 3 and 4 should be refined with the assistance data replaced by “information”. Qualcomm think for UE-assisted mode, we do not need assistance data for integrity anyway. Ericsson think we could say “results related to integrity” here as well.

Agreements:

Replace “error sources” with “results related to integrity” in the fourth bullet and the last note.

Replace “assistance data” with “results related to integrity” in bullets 2 and 3.

TP in R2-2213143 is endorsed to be merged into the main TP to 38.859, with these changes.

The following documents will not be individually treated

[R2-2211227](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211227%20Discussion%20on%20RAT%20dependent%20integrity.docx) Discussion on RAT dependent integrity CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211231](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211231%20Discussion%20on%20RAT-dependent%20positioning%20integrity.docx) Discussion on RAT-dependent integrity vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211251](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211251%20Discussion%20on%20RAT-dependent%20integrity_final.docx) Discussion on RAT-dependent Integrity Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211463](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211463%20_support%20of%20RAT%20dependent%20integrity.docx) Integrity for RAT dependent positioning methods Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211838](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211838%20Consideration%20on%20RAT-dependent%20integrity.docx) Consideration on RAT-dependent integrity OPPO discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211918](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211918_Integrity.docx) Considerations on some aspects for integrity of RAT dependent positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212050](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212050%20%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent integrity Lenovo discussion Rel-18

[R2-2212074](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212074%20Discussion%20on%20RAT-dependent%20positioning%20integrity.doc) Discussion on RAT-dependent positioning integrity Xiaomi discussion

[R2-2212170](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212170%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

[R2-2212242](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212242_(integrity).docx) Integrity of NR Positioning Technologies Qualcomm Incorporated discussion

[R2-2212358](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212358%20Integrity.docx) Text proposal and Signaling for Integrity Computation at LMF Ericsson discussion Rel-18

[R2-2212505](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212505%20DNU%20Integrity%20Alert.docx) Use of DNU flag for RAT-dependent positioning integrity Nokia, Nokia Shanghai Bell discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212509](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212509%20(R18%20NR%20POS%20SI%20A823_Integrity).doc) Discussion on RAT-dependent Integrity InterDigital Communications discussion Rel-18

R2-2212564 Discussion on RAT dependent integrity BUPT discussion Late

[R2-2212625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212625.docx) Discussion on the integrity issues CMCC discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212684](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212684%20Discussion%20on%20RAT-dependent%20methods%20positioning%20integrity.docx) Discussion on RAT-dependent methods positioning integrity ZTE Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212884](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212884%20(8.2.3)%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent integrity Samsung Electronics Romania discussion

Withdrawn/Not available

R2-2212361 Text proposal and Signaling for Integrity Computation at LMF Ericsson discussion Rel-18 Withdrawn

### 8.2.4 LPHAP

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

AI summary

[R2-2213120](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213120%20Summary%20of%20AI%208.2.4%20for%20LPHAP_final.docx) Summary of AI 8.2.4 for LPHAP Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

Enhanced SRS configuration

Proposal1: SRS positioning validity area for UL positioning in RRC\_INACTIVE can avoid frequent reconfiguration of SRS configuration upon cell reselection and is recommended for normative work from R2’s perspective if feasible from R1’s perspective

 The solution should not require the gNB to monitor multiple SRS configuration simultaneously for a UE

Proposal2: SRS configuration update request for SRS positioning validity area can be discussed during normative work

 Scenarios requiring SRS configuration update request include:

 Scenario1: During the UL positioning procedure, when the SRS configuration turns invalid, e.g., when the UE moves out of the SRS positioning validity area.

 Sceanrio2: At the initiation of UL positioning procedure when an event is detected.

 Detailed solution for the SRS update, e.g., with RRC message, UL MAC, or NG-AP message can be discussed in the WI phase

Discussion:

Qualcomm think the request is not necessarily for an “update” but just for an SRS configuration, and they think it should not be combined with the validity area.

Huawei agree we can remove “update”; for the second point, they think the point is to avoid signalling inefficiencies and have the UE request the configuration only when it needs it. They agree that even in legacy operation there is an event report when the UE wants to perform positioning.

Xiaomi wonder if the UE asks the gNB or the LMF. Huawei indicate it is the gNB, since the gNB provides the SRS configuration.

Intel think if the request is from UE to gNB, we need a new procedure in RAN3 to bring the new configuration to LMF.

vivo think there is an update procedure in NRPPa already.

Ericsson think RAN3 would need to check the applicability.

OPPO wonder about scenario 2; why do we need an additional configuration request over legacy operation? Huawei clarify the intention is to develop a unified solution for the UE to request a configuration from the network and avoid wasting resources, by having the UE only send the request when it needs to do positioning. OPPO wonder why the RRCResumeRequest does not work for such a scenario; Huawei understand this is mainly used for the UE to transit to RRC\_CONNECTED or do SDT.

Nokia think we are going into normative work details.

Intel wonder if we really want to do all these solutions as part of the normative work; everything can be discussed in principle, but we have limited time.

Nokia think we had limited study time also and this is the last meeting, so if we can agree on a framework we should.

Qualcomm agree with Intel, but they think this has happened historically with positioning WIs; we summarise our findings, and what goes in the WI is a plenary decision.

Proposal3: Pre-configuration of multiple SRS configurations for multiple SRS positioning valid areas can be discussed in normative work.

 The pre-configuration of multiple SRS configurations can be delivered to the UE either by dedicated signalling or SI broadcast

Proposal4: The following issues related to SRS positioning validity area can be discussed during the WI

 SRS configuration details, including common/UE-specific SRS configuration, association with DL reference signal, siganling design, SRS resources reservation, etc.

 SRS transmission validation

 Longer SRS transmission periodicity

RRC\_INACTIVE procedure

Proposal5: Paging relaxation by skipping paging reception in RRC\_INACTIVE for LPHAP is beneficial from power saving point of view and feasible from higher layer’s perspective. Skipping paging reception in RRC\_INACTIVE is recommended for normative work from R2’s perspective for achieving LPHAP requirements.

 Detailed solutions to be discussed during the WI phase, FFS which WI

Discussion:

CATT think this can also be done in deferred MT-LR, which is positioning business. Huawei agree.

ZTE have some confusion about why this proposal is “recommended” for normative work, vs. “can be discussed”. They think there is not a majority view in this respect.

Apple wonder if the proposal belongs to positioning and would prefer not to have it.

Intel think we just identify the potential solutions from RAN2 perspective, and whether they should be included in the WI is plenary business.

Ericsson agree with Intel; the important thing is what we are doing, i.e., dropping paging. They think it is not positioning-specific.

PRS and DRX alignment

Proposal6: Alignment between DRX and PRS is beneficial from power saving point of view for LPHAP and is recommended to normative work

 Two scenarios for DRX/PRS alignments are considered: (a) PRS alignment with fixed DRX (b) DRX alignment with fixed PRS

 Solutions for the PRS/DRX alignment, e.g., LMF-based/UE-based solution, to be discussed in the WI phase

 Impacts to different RRC states (RRC\_INACTIVE and RRC\_IDLE) to be discussed in WI phase

RRC\_IDLE positioning

Proposal7: DL positioning in RRC\_IDLE is recommended to normative work from R2’s perspective if power saving benefits are confirmed by R1

 Measurement is performed in RRC\_IDLE while measurement report is sent in RRC\_CONNECTED

 Feasibility of measurement report in msg5 should be evaluated with SA2/3 involved.

 Whether the CN can handle the measurement reports from the UE in RRC\_CONNECTED, while the positioning measurement was performed in RRC\_IDLE, should be evaluated in the WI phase with SA2 involved.

Proposal8: Leave the evaluation of whether UL positioning in RRC\_IDLE is feasible to R1.

 R2 can continue the discussion in WI phase if it is feasible from R1’s perspective

LS from SA2 for LPHAP indication

Proposal9: Confirm that R2 has not identified the the necessity of the LPHAP indication to the gNB before positioning procedure.

RRC state transition and LPP segmentation

Proposal10: RRC state transition assistance can be discussed in the WI phase

Proposal11: LPP segmentation can be discussed in separate agenda item from LPHAP

Event Report Skipping

Proposal12: Skipping event report for LPHAP can be discussed in the WI phase with SA2 involvement.

Agreements:

Proposal1 (modified): SRS positioning validity area for UL positioning in RRC\_INACTIVE can avoid reconfiguration of SRS configuration upon cell reselection and is recommended for normative work from R2’s perspective if feasible from R1’s perspective

 The solution should not require the gNB to monitor multiple SRS configuration simultaneously for a UE

Proposal2 (modified): SRS configuration request can be discussed during normative work from RAN2 perspective.

 Scenarios requiring SRS configuration request include:

 Scenario1: During the UL positioning procedure, when the SRS configuration turns invalid, e.g., when the UE moves out of the SRS positioning validity area.

 Scenario2: At the initiation of UL positioning procedure when an event is detected.

 Detailed solution for the SRS update, e.g., with RRC message, UL MAC, or NG-AP message can be discussed in the WI phase

Proposal3 (modified): Pre-configuration of multiple SRS configurations (e.g., for multiple SRS positioning validity areas) is feasible from RAN2 perspective and can be discussed in normative work.

 The pre-configuration of multiple SRS configurations can be delivered to the UE either by dedicated signalling or SI broadcast

* [AT120][421][POS] Remaining proposals on LPHAP (Huawei)

Scope: Discuss P5-P12 of R2-2213120 and attempt to converge.

Intended outcome: Report to CB session in R2-2213144

Deadline: Wednesday 2022-11-16 1800

[R2-2213144](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213144%20Discussion%20on%20the%20summary%20of%20AI%208.2.4%20for%20LPHAP_final.docx) Continued discussion summary of AI 8.2.4 for LPHAP Huawei, HiSilicon discussion Rel-18 FS\_NR\_pos\_enh2

Easy agreements

Proposal2: Alignment between DRX and PRS is beneficial from power saving point of view for LPHAP and is recommended to normative work. (14/15)

 Two directions of solutions for DRX/PRS alignments are considered: (a) PRS alignment with fixed DRX (b) DRX alignment with fixed PRS

 Solutions for the PRS/DRX alignment, e.g., LMF-based/UE-based solution, is to be discussed

 Impacts to different RRC states (RRC\_INACTIVE and RRC\_IDLE) is to be discussed

Proposal3: DL positioning in RRC\_IDLE is recommended to normative work from R2’s perspective if power saving benefits are confirmed by R1. (15/15)

 Measurement is performed in RRC\_IDLE while measurement report is sent in RRC\_CONNECTED

 Feasibility of measurement report in msg5 should be evaluated with SA2/3 involved.

 Whether the CN can handle the measurement reports from the UE in RRC\_CONNECTED, while the positioning measurement was performed in RRC\_IDLE, can be evaluated in the WI phase with SA2 involved.

Proposal4: Leave the evaluation of whether UL positioning in RRC\_IDLE is feasible to R1. (13/14)

 R2 can continue the discussion in WI phase if it is feasible from R1’s perspective

Potentially agreeable:

Proposal1: Paging relaxation by skipping paging reception in RRC\_INACTIVE for LPHAP is beneficial from power saving point of view and feasible from R2’s perspective. Skipping paging reception in RRC\_INACTIVE is recommended for normative work from R2’s perspective for achieving LPHAP requirements. (8/11)

 The power saving gain can be further evaluated in R1.

 Impacts of skipping paging for UE in RRC\_INACTIVE to the core network could be evaluated with SA2 involved in the WI phase.

Discussion:

ZTE think the first bullet should be removed and we should formulate the proposal as “if feasible from RAN1 perspective” in the main part instead.

Huawei think this recommendation is from RAN2 perspective, and of course if RAN1 conclude it is infeasible, it will not go into the WI phase.

Xiaomi would like to understand the relationship between this and the ultra-deep sleep discussed in RAN1, and whether we will discuss two different options. Huawei understand that the ultra-deep sleep is part of RAN1’s power evaluation model and not related to feasibility and benefit from RAN2 perspective.

CATT think from RAN2 perspective, the benefits of relaxed paging are there for deferred MT-LR, so the proposal seems fair.

Intel think RAN1 have agreed to support eDRX for power saving for LPHAP, and they wonder whether this paging relaxation is the same as what RAN1 did. Huawei understand they are two solutions, not mutually exclusive.

Ericsson think Intel and Xiaomi’s questions are essentially the same, but Huawei’s answers seem to imply they are different. They understand that it is not clear where paging relaxation would be discussed, in the positioning WI or elsewhere.

ZTE indicate that the reason for their concern is that RAN1 may find feasibility problems, e.g. related to missing SSBs.

Huawei think the analysis should be from RAN2 perspective and we should assume that this will not go to the WI phase if there are problems from RAN1 side.

CATT think Ericsson’s question about which WI should handle it can be answered: In their view this is about positioning because it is based on a positioning requirement.

Intel indicate that the WI content is a plenary discussion and the recommendation should be from RAN2 perspective.

Nokia think if paging can be skipped, so can measurement reports (P6 below), and we could merge the discussion.

CMCC agree with the current version of P1, and they agree with Nokia that P6 can be merged. Intel think the measurement part is unclear; does it mean the UE can skip an RRC measurement report, or skip a measurement report for PRS? Nokia indicate they were referring to LPP measurements of PRS.

Ericsson do not recall that we discussed skipping measurement reports, and they think there may be related RAN1 requirements.

Intel think P6 is based on offline discussions only and this is the first time we see it online

Proposal6: R2 can discuss on measurement report skipping in the WI phase

Discussion:

Ericsson think we should not capture this.

Nokia want to keep P6; they understand that we had as much discussion on paging as on measurements.

OPPO agree with Intel that we should not take P6 due to insufficient discussion.

Qualcomm agree with Ericsson; they do not see the connection with skipping paging. In LPP measurements, the LMF expects something and may take assumptions about the UE if the response does not come.

Sony also think skipping measurements should be configurable from the LMF; for the paging skipping, they wonder if we are saying that a UE in RRC\_INACTIVE can cease monitoring POs at all.

ZTE agree that P6 should be deleted.

vivo think P6 is similar to P5, because the measurement report in deferred MT-LR goes with the event report.

Lenovo think P6 is confusing and should not be captured.

CATT consider that there is a use case in deferred MT-LR for LPHAP where the UE can send an indication to the network that it can skip paging during positioning to save power, in something like a MICO mode for positioning specifically.

Nokia can accept not capturing the proposal, but to Qualcomm’s concern about the LMF missing a report, they assume something will be indicated saying the UE is skipping reports when the measurement is close to a previously reported measurement.

Issues to be discussed:

Proposal5: Discuss whether skipping event report for LPHAP can be discussed in the WI phase with SA2 involvement. (5/12)

Discussion:

Huawei think we have agreed that we will discuss SRS configuration request in the normative phase, and they think this may already be covered by that agreement.

Intel understand that this is SA2 work and there is no RAN2 aspect.

Xiaomi think in Rel-17 RAN2 defined a signalling procedure for RRC\_INACTIVE that used the event report as a trigger to LMF, and they think we can discuss a similar procedure for LPHAP and send an LS to SA2.

Qualcomm think this could be contribution-driven in the WI phase without capturing anything here.

Agreements:

Proposal2: Alignment between DRX and PRS is beneficial from power saving point of view for LPHAP and is recommended to normative work. (14/15)

 Two directions of solutions for DRX/PRS alignments are considered: (a) PRS alignment with fixed DRX (b) DRX alignment with fixed PRS

 Solutions for the PRS/DRX alignment, e.g., LMF-based/UE-based solution, is to be discussed

 Impacts to different RRC states (RRC\_INACTIVE and RRC\_IDLE) is to be discussed

Proposal3: DL positioning in RRC\_IDLE is recommended to normative work from R2’s perspective if power saving benefits are confirmed by R1. (15/15)

 Measurement is performed in RRC\_IDLE while measurement report is sent in RRC\_CONNECTED

 Feasibility of measurement report in msg5 should be evaluated with SA2/3 involved.

 Whether the CN can handle the measurement reports from the UE in RRC\_CONNECTED, while the positioning measurement was performed in RRC\_IDLE, can be evaluated in the WI phase with SA2 involved.

Proposal4: Leave the evaluation of whether UL positioning in RRC\_IDLE is feasible to R1. (13/14)

 R2 can continue the discussion in WI phase if it is feasible from R1’s perspective

Proposal1 (modified): Paging relaxation by skipping paging reception in RRC\_INACTIVE for LPHAP is beneficial from power saving point of view and feasible from R2’s perspective. Skipping paging reception in RRC\_INACTIVE is recommended for normative work from R2’s perspective for achieving LPHAP requirements, if feasible and beneficial from RAN1 perspective. (8/11)

 The power saving gain can be further evaluated in R1.

 Impacts of skipping paging for UE in RRC\_INACTIVE to the core network could be evaluated with SA2 involved in the WI phase.

The following documents will not be individually treated

[R2-2211228](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211228%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211232%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211250](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211250%20Discussion%20on%20LPHAP_final.docx) Discussion on LPHAP Huawei, HiSilicon, CATT, China Unicom, Nokia, Spreadtrum discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211464](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211464_support%20of%20LPHAP.docx) Support of LPHAP Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211840](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211840%20Further%20consideration%20on%20LPHAP.docx) Further consideration on LPHAP OPPO discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211919](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211919_LPHAP.docx) Considerations on some aspects for LPHAP Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212051](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212051%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2212072](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212072_SRS_Configuration_Fraunhofer.docx) SRS Configuration for supporting LPHAP Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2212075](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212075%20Discussion%20on%20LPHA%20positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2212180](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212180%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Spreadtrum Communications discussion Rel-18

[R2-2212230](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212230.docx) DL Positioning measurement report THALES discussion

[R2-2212243](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212243_(LPHAP).docx) Enhancements to Positioning in RRC\_INACTIVE State for LPHAP Qualcomm Incorporated discussion

[R2-2212360](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212360%20LPHAP.docx) UL SRS Inactive mode complexities and Sequence ID Management and Simulations Recommendations Ericsson discussion Rel-18

[R2-2212510](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212510%20DRX-related%20enhancement%20for%20LPHAP.docx) DRX related enhancement for LPHAP Nokia, Nokia Shanghai Bell discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212512](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212512%20(R18%20NR%20POS%20SI%20A824_LPHAP).doc) Discussion on LPHAP InterDigital Communications discussion Rel-18

[R2-2212648](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212648%20Discussion%20on%20the%20alignment%20between%20DRX%20and%20PRS%20configuration.docx) Discussion on the alignment between PRS and DRX Samsung discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212683](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212683%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP ZTE Corporation discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2212711](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212711%20Further%20considerations on LPHAP.doc) Further considerations on LPHAP CMCC discussion Rel-18 FS\_NR\_pos\_enh2

### 8.2.5 RedCap positioning

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

[R2-2211465](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211465%20_RedCap%20positioning.docx) Support of RedCap Intel Corporation discussion Rel-18 FS\_NR\_pos\_enh2

Proposal 1: Postpone the discussion on RedCap positioning until there is reasonable progress in RAN1.

Proposal 2: The decision on RedCap positioning is left to RAN1. No recommendation is needed from RAN2 on this.

Discussion:

Ericsson think we should say that RAN2 do not see any issue in pursuing RedCap; they think no recommendation at all is not good. They think we could recommend capability indication and signalling to support frequency hopping.

Intel think we could follow RAN1 decision from RAN2 perspective.

Huawei think we could follow RAN1 decision also.

Ericsson wonder if we could have a quick offline.

OPPO think following the RAN1 decision is enough.

Ericsson think Bluetooth methods would be missed.

Lenovo agree with Intel.

Huawei think Bluetooth would also be discussed in RAN1 as part of carrier phase.

Agreement:

Proposal 2 (modified): The decision on RedCap positioning recommendation is left to RAN1. No recommendation is needed from RAN2 on this.

[R2-2212228](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212228%20RedCap%20positioning%20requirements%20for%20Public%20Safety%20Personal%20Protection%20Equipment%20(PPE).docx) RedCap positioning requirements for Public Safety Personal Protection Equipment (PPE FirstNet, AT&T, UK Home Office, Erillisverkot, MINISTERE DE L’INTERIEUR, SyncTechno Inc., Softil, Nkom discussion

[R2-2211229](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211229-Discussion%20on%20RedCap%20Positioning.docx) Discussion on RedCap Positioning CATT discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211233](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211233%20Discussion%20on%20RedCap%20positioning.docx) Discussion on RedCap positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2211270](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211270%20Discussion%20on%20REDCAP%20Positioning.docx) Discussion on RedCap Positioning Huawei, HiSilicon discussion

[R2-2212052](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212052%20Discussion%20on%20RedCap%20Positioning.doc) Discussion on RedCap positioning Lenovo discussion Rel-18

[R2-2212076](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212076%20Discussion%20on%20RedCap%20UE%20positioning.doc) Discussion on RedCap UE positioning Xiaomi discussion

[R2-2212362](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212362%20RedCap.docx) Positioning for RedCap UEs including Bluetooth and Text Proposal Ericsson discussion Rel-18

[R2-2212515](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212515%20(R18%20NR%20POS%20SI%20A825_RedCap).docx) Discussion on positioning for RedCap UE InterDigital Communications discussion Rel-18

[R2-2212682](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212682%20Discussion%20on%20RedCap%20positioning.docx) Discussion on RedCap positioning ZTE Corporation discussion Rel-18 FS\_NR\_pos\_enh2

## 8.9 Enhanced NR Sidelink Relay

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

Time budget: 1.5 TU

Tdoc Limitation: 4 tdocs

### 8.9.1 Organizational

Including incoming LSs and rapporteur inputs.

[R2-2211120](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211120_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

Discussion:

LG think we may not have a sufficient understanding of the connected mode behaviour to answer yet. They also understand that RAN3 have made a decision on this and indicated this information is not needed from RAN3 perspective.

### 8.9.2 UE-to-UE relay

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

AI summary

[R2-2213121](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Docs\R2-2213121.zip) Summary of agenda item 8.9.2 on UE-to-UE relay vivo discussion

[Easy proposal]

Proposal 2: RAN2 to agree that in U2U relay, OOC UEs obtain discovery configuration from pre-configuration and IDLE/INACTIVE UEs obtain discovery configuration from SIB.

Discussion:

OPPO think also other common U2U configurations can come from preconfiguration and SIB, different from the U2N principle.

Proposal 5: RAN2 postpones the discussion on whether there is a need for an indication of whether gNB is capable of U2U relay.

Proposal 6: RAN2 to confirm that SL-SRB0 is reused for DCR message for discovery integrated into PC5 unicast link establishment procedure.

Discussion:

Intel understand SA2 are still discussing the integrated method of discovery, and they wonder if this implies that we in RAN2 agree with the design; maybe we could add a conditional.

vivo understand this is supported in SA2, but they are OK to add a conditional.

Qualcomm note that we have not received an LS, so it is hard to know how to progress on items related to their work.

Proposal 13: Source Remote UE can trigger U2U Relay selection when PC5 RSRP (FFS SL-RSRP or SD-RSRP) of direct link towards target Remote UE is below a threshold. FFS PC5 RLF of the PC5 direct link. FFS whether/how target remote UE can trigger relay selection.

Discussion:

OPPO think there is no clear concept of “source” or “target”; they would like to say any remote UE can trigger relay selection, and replace “target” with “peer remote UE is below a threshold”, and remove the FFS at the end.

vivo understand that the source role is clear in the SA2 TR, and the proposal reflects contributions.

Xiaomi think we do not have a clear definition of source and target in RAN2, and they like OPPO’s proposal as a first step.

Samsung agree with OPPO’s view and think there is no difference between source and target in RAN2 view.

Apple think relay (re)selection is in RAN2 work scope, and they are surprised that SA2 are taking decisions on it. On the proposal, they think this is talking about the case of a link quality drop between two directly connected UEs, and they think relay discovery should happen first.

CATT understand SA2’s source and target concept is about who selects the relay UE finally, and here we are talking about the selection triggering. They share OPPO’s view.

InterDigital understand that the source is the initiating UE for the relay selection, and they think the FFS should say it is FFS if during the selection the target makes some decision.

MediaTek agree with OPPO.

Xiaomi are not sure if we have only one remote UE triggering selection at a time; they think both might be able to do it simultaneously.

Futurewei suggest “initiator” and “responder” remote UEs.

Lenovo think one UE would realise first that the link is failing; they will not both trigger it at the same instant. They wonder if there is merit in the UE that detects it first going to the peer to say “let’s find a relay”, rather than finding a relay and having it reach out to the desired peer remote UE. So they would like to address the last FFS in the proposal now.

Apple think for the selection case, there is no difference between the two UEs, because they start with a direct link. They think the modified proposal does not fully address their concern because it is not clear if one UE is defined as the initiator. They think discovery should be triggered before selection.

vivo think for the relay selection procedure, in the SA2 TR the two UEs are understood as playing different roles; the source first discovers that the link is not good, and the target may respond to discovery or not, based on the received discovery message from the relay UE.

Fraunhofer have a similar view to Apple; if there is no direct link between the two remote UEs, there is no measurement to trigger the selection.

Intel think if we do not agree on source and target definitions, the proposals will be challenging. When there is a direct link, they understand that it is initiated from upper layers, and the UE that initiates the DCR is the source UE and has the burden of finding a new relay if the link quality fails. So they think the source UE retains its role for the lifetime of the connection.

Ericsson think the intention of the proposal was to say that relay selection happens when the PC5 link goes below a threshold.

LG think this is applicable on ly when the service is allowable for UE-to-UE relay, and we could either have the AS layers report SL-RSRP to upper layers and the upper layer trigger relay selection, or the upper layer inform the AS layer in advance if the service is allowable.

OPPO want to understand Apple’s concern better; for model A, the remote UE just needs to receive the discovery message, and once the relay UE transmits the discovery message, the remote UE can receive it. They see some relation to proposal 8.

Apple indicate that OPPO are describing the case where the UEs have some measurements before the link degrades, but their concern is for the case that there are not measurements in hand.

Proposal 14: Source remote UE can trigger U2U Relay reselection when PC5 RSRP (FFS SL-RSRP or SD-RSRP) between the source remote UE and the relay UE is below a threshold. FFS whether/how the Source Remote UE should know the PC5 RSRP for the second hop (e.g. based on relay UE indication). FFS whether/how target remote UE can trigger relay reselection.

Proposal 15: RAN2 does not agree T400 as a new relay reselection trigger because it is already considered when determining PC5 RLF to trigger relay reselection.

Discussion:

Xiaomi point out that we did not agree RLF is the reselection trigger, and they see T400 more as a case of predicting RLF rather than detecting RLF.

Ericsson think Xiaomi’s scenario is not correct.

Intel quote the previous agreement that we did agree RLF as a reselection trigger.

vivo wonder if T400 is really predictive; they understand that T400 expiry triggers RLF essentially at the same time.

Lenovo think we would not specify a behaviour like “just before T400 expires, the UE may…”, and they think reselection can be triggered without this.

Nokia agree with the proposal and think other methods can be used.

Proposal 16: As in U2N relay, when source remote UE receives PC5-RLF indication from the U2U relay UE, if source remote UE decides to release the PC5 link between the source remote UE and the U2U relay UE, it would inform upper layers and relay reselection can be triggered based on upper layer indication.

Discussion:

Apple have some doubts about the wording, because if the UE has to wait for the upper layer for reselection, it is not clear how/why it decides to release the PC5 link beforehand. They think reselection needs to be triggered when the PC5-RLF indication comes, irrespective of whether the link is kept for other reasons.

vivo think the sentence here is related to the U2N case, where the UE may decide to release the PC5 link when the Uu link fails; but they think Apple’s comment is reasonable.

OPPO basically agree with the modified proposal, but they think some clarification should be added to the effect that the remote UE that received the indication should trigger the reselection.

Xiaomi are not sure that the proposal says exactly what is intended; this is a case where the peer UE (e.g., the target) would be aware of the RLF and should be starting reselection.

Qualcomm wonder if the upper layer has to trigger reselection or can try to recover.

InterDigital think the modified proposal is parallel to U2N, where the upper layer decides if it can recover or should trigger reselection. Here they think recovery may not be possible because there is no other path to the peer remote UE.

Intel wonder if the remote UE behaviour on whether to keep or release the connection needs to be defined. In U2N we indicated that the implementation can decide whether to keep or release the connection.

Lenovo think the peer UE will also be looking for a new relay UE at the same time, and just indicating to the upper layer that the link has gone down may not be enough; the AS layer could try to recover. They are concerned that the layers could get out of sync.

InterDigital think we need behaviours both at the remote UE that detects RLF and the remote UE that receives the indication.

Ericsson have some sympathy for Apple’s scenario with a one-to-many mapping at the relay UE, and they think we could have different behaviours depending on the relay topology.

Proposal 17: Reuse Rel-17 U2N principle for SL-RSRP/SD-RSRP in relay (re)selection criteria in U2U relay, i.e., use SL-RSRP when there is data transmission and up to UE implementation to use SL-RSRP or SD-RSRP when there is not. FFS how RSRP on both hops are considered.

Discussion:

Nokia think this was a mistake in Rel-17 and should not have been left to UE implementation, because the other side cannot interpret the result and SL-RSRP and SD-RSRP can be totally different.

Xiaomi tend to agree with Nokia but would like to understand if it means there needs to be some negotiation of a mutually agreeable RSRP.

Apple think this case is different from U2N because the role of SL-RSRP/SD-RSRP is quite important here where it applies to both links. InterDigital agree with Apple and think it is important that the measurements are consistent.

OPPO do not see a big difference between SD-RSRP and SL-RSRP and do not think an additional FFS is needed in this direction.

Qualcomm think the measured quantity for the two hops can be independent.

Agreements:

Proposal 2: RAN2 to agree that in U2U relay, OOC UEs obtain discovery configuration from pre-configuration and IDLE/INACTIVE UEs obtain discovery configuration from SIB.

Proposal 6 (modified): RAN2 to confirm that SL-SRB0 is reused for DCR message if discovery is integrated into PC5 unicast link establishment procedure.

UE-to-UE relay selection can be triggered based on the PC5 RSRP (FFS SL-RSRP or SD-RSRP) of the direct link falling below a threshold. FFS which remote UE (or both) can trigger relay selection. FFS the relationship between selection and discovery.

UE-to-UE relay reselection can be triggered based on the PC5 RSRP (FFS SL-RSRP or SD-RSRP) between a remote UE and the relay UE falling below a threshold. FFS which remote UE (or both) can trigger relay reselection. FFS if/how the second hop between the relay UE and the peer UE is considered.

Proposal 15: RAN2 does not agree T400 as a new relay reselection trigger because it is already considered when determining PC5 RLF to trigger relay reselection.

Proposal 16 (modified): When the remote UE receives PC5-RLF indication from the U2U relay UE, it would inform upper layers and rely on upper layers to trigger relay reselection (or not). FFS if there would be any constraints on the remote UE implementation behaviour to keep or release the PC5 link with the relay UE.

[To be discussed]

Proposal 1: RAN2 to discuss to have a unified terminology for the three UEs in U2U relay operation, which are ‘source U2U end UE’, ‘U2U relay UE’ and ‘target U2U end UE’.

Discussion:

Ericsson think SA2 are already discussing terminology.

vivo think we do not have consensus on the source/target terminology, but the point is whether we need to replace “remote UE” with “end UE”. They understand SA2 use “remote UE” only for Rel-17 ProSe.

vivo think the terminology is a matter of company preference.

Intel think we need not change based on the SA2 TR.

Xiaomi think if we want to reuse existing text, we should keep existing terms to avoid rewriting a lot of text.

CATT agree with Intel that there is no need to change now.

Proposal 3: RAN2 to discuss in U2U relay, RRC\_CONNECTED UEs obtain discovery configuration from SIB or dedicated signalling.

Proposal 4: RAN2 to agree that mode-1 and mode-2 are supported in U2U relay for both remote UEs and relay UE.

Proposal 7: RAN2 to discuss whether the condition to control discovery message transmissions can be used to control DCR message as well in case of discovery integrated into PC5 unicast link establishment procedure.

Proposal 8: RAN2 to discuss whether the following can be agreed as AS-conditions for discovery message transmission at source/target remote UEs:

1) Source Remote UE can transmit discovery message only when the PC5 RSRP (FFS SL-RSRP or SD-RSRP) of direct link towards target Remote UE is below a configured threshold. FFS PC5 RLF of the PC5 direct link.

2) Target Remote UE can response based on the received discovery message only when the PC5 RSRP (FFS SL-RSRP or SD-RSRP) towards the relay UE is above a configured threshold.

Proposal 9: RAN2 to discuss whether the following can be agreed as AS-conditions for discovery message transmission at U2U relay UE:

1) Relay UE can forward discovery message to target remote UE only when the PC5 RSRP (FFS SL-RSRP or SD-RSRP) between the relay UE and source remote UE is above the minimum threshold. FFS whether maximum threshold is also applied.

2) Relay UE can respond discovery message to source remote UE only when the PC5 RSRP (FFS SL-RSRP or SD-RSRP) between this relay UE and target remote UE is above the minimum threshold. FFS whether maximum threshold is also applied.

Proposal 10: RAN2 to wait for more SA2 progress before discussing how to determine the neighbour list at U2U relay UE and whether it is used as discovery transmission condition at relay UE.

Proposal 11: RAN2 to agree that the same dedicated discovery resource pool (defined in Rel-17), if configured, can be used for non-relay discovery, U2N relay discovery and/or U2U relay discovery as baseline. Can be revisited if any impact on co-existence between U2N/U2U.

Proposal 12: RAN2 to further discuss whether to support co-existence between U2N relays and U2U relays and the potential specification impact if any.

Proposal 18: RAN2 to further discuss whether the following new criteria can be supported for relay (re)selection:

- Relay load

- PLMN/gNB/Cell ID

- Existed PC5 link (i.e. Relay UE having an established unicast link with target remote UE should be prioritized)

Proposal 19: RAN2 send LS to SA2 to check whether it is feasible to differentiate the Layer 2 ID for following cases:

- 1) between U2U relay and U2N relay/non-relay link

- 2) between U2U communication and U2U discovery

Discussion:

vivo think we have had contributions proposing this LS previously, and it would be beneficial to have it.

Samsung have a similar view to send the LS; they are not sure about U2U/U2N coexistence, but we can check.

Lenovo wonder what benefit we are looking for. In particular, they wonder if the same UE can do U2U and U2N at the same time.

Qualcomm think we need to check with SA2.

Ericsson see that the impetus for the discussion was about measuring SL-RSRP with the UE and using it for another service with a different L2ID.

ZTE also see the need to send the LS; they think there are interactions between the coexistence question and the scenarios that should be determined by SA2.

Lenovo understand the purpose is that a UE could use the measurement from one L2ID to another L2ID. They think that we have never tried to optimise for cases of the same physical UEs with different L2IDs before.

Kyocera think we should send the LS and we need clarification on the coexistence issue. They understand that a relay could support both U2U and U2N, and this could affect (re)selection.

Nokia also do not see the benefit of the answer: What would be the RAN2 impact? They understand that the services would be different and so the L2IDs would be different.

Apple support sending the LS and think there will be impact to the AS layers in many places.

OPPO also think there is value in sending the LS, and they think there is a relation to service continuity as well.

Lenovo think it is surprising that we talk about this optimisation now after not looking at it for several releases. If SA2 say that different L2IDs can be identified as the same physical UE, they are not sure what we would do.

InterDigital also support sending the LS, and they think the point is that here we want to distinguish between U2N and U2U, which is a new problem not reflected in Rel-16.

Intel support sending the LS.

LG think we should also ask about coexistence between U2U and U2N. Ericsson think this is not in the objectives.

Kyocera think we should ask about coexistence.

Ericsson think handling coexistence could open a can of worms.

Xiaomi think we need to be mindful of the time frame and we should not optimise for cases that may require a lot of extra work or a WID update.

LG point out that we may not need to support service continuity between U2U and U2N, but it is good to know if there are cases where a UE has to choose between them.

Qualcomm support asking about coexistence; they think it was proposed by several companies and it is better to get clarification.

Ericsson think SA2 do not have a related objective either.

Huawei think the coexistence is related to the first question; if there is no coexistence, then the differentiation is not needed. About service continuity, they wonder if it means lossless path switch at PDCP, or if relay reselection can be considered as service continuity.

Ericsson are afraid coexistence would trigger other discussions about optimisations based on the result.

Lenovo think if we do not ask the question and do not do anything about it, the same UE might function as both U2U and U2N, and this may not be a problem for AS layer; they also are not sure that the issue really impacts AS. They understand that the discovery L2ID for different purposes must be different, and since NAS knows which case is in use, it can determine whether it wants to support coexistence; they wonder if there is anything to do in the access stratum.

Kyocera think U2U and U2N have a lot of interaction with SA2 and we should find out what they can or cannot do.

* [AT120][422][Relay] LS to SA2 on L2IDs for U2U/U2N (CATT)

Scope: Draft an LS to SA2 inquiring whether it is feasible to differentiate the Layer 2 ID for following cases:

- 1) between U2U relay and U2N relay/non-relay link

- 2) between U2U communication and U2U discovery

Also ask if there is a coexistence scenario in which the UE supports both U2U and U2N.

Intended outcome: Agreeable LS in R2-2213152

Deadline: Thursday 2022-11-17 1800

[Deprioritized (CP procedures)]

Proposal 20: RAN2 to agree that QoS split is performed per direction.

Proposal 21: RAN2 to discuss which node is responsible for QoS split:

- Option 1: by source UE (in RRC\_IDLE/INACTIVE) or source UE’s serving gNB (in RRC\_CONNECTED)

- Option 2: by the Relay UE.

Proposal 22: RAN2 to agree that for U2U relay, PC5 adaptation layer header should include:

- Option-1: source UE ID, target UE ID (FFS local ID or L2 ID) and BEARER ID

- Option-2: only one UE ID (FFS local ID or L2 ID) and BEARER ID

Proposal 23: Path switch for service continuity is not supported in U2U relay from AS layer perspective. Path switch for other purposes is not excluded (e.g. condition for UE to change from indirect path to direct path)

R2-2213152 [Draft]LS on Differentiation of Layer2 ID and Coexistence of U2N/U2U CATT LS out Rel-18 NR\_SL\_relay\_enh-Core To:SA2

The following documents will not be individually treated

[R2-2211279](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211279%20Disussion%20on%20U2U%20relay%20discovery%20and%20(re)selection.docx) Discussion on U2U Relay Discovery and (Re)selection CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211400](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211400%20Discussion%20on%20NR%20sidelink%20UE%20to%20UE%20relay_cl.docx) Discussion on NR sidelink UE to UE relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211401](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211401_U2U_Relaying_Discovery_Reselection_Intel.docx) Discovery and reselection with UE-to-UE relaying Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2211534](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211534_Remaining_Issues_Relay_reSelection_and_Discovery.docx) Remaining Issues on Relay (re)Selection and Discovery Ericsson España S.A. discussion Rel-18

[R2-2211630](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211630%20(R18%20SL%20Relay%20WI_AI892%20RelayDiscoverySelection).doc) Discovery and Relay Selection for UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211675](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211675_Discussion%20on%20the%20common%20L2%20L3%20parts%20for%20U2U%20relaying.docx) Discussion on the common L2 L3 parts for U2U relaying vivo discussion

[R2-2211697](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211697%20Discussion%20on%20U2U%20relay.doc) Discussion on UE-to-UE Relay Apple discussion NR\_SL\_relay\_enh-Core

[R2-2211753](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211753%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211781](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211781+Discussion%20on%20U2U%20relay.doc) Discussion on U2U relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211785](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211785-U2U%20Relay%20open%20issues%20and%20coexistence%20with%20U2N%20Relay.docx) U2U Relay open issues and coexistence with U2N Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2211816](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211816%20Discussion%20on%20U2U%20relay%20communication.docx) Discussion on U2U relay communication ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211821](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211821_UE%20to%20UE%20relay%20discovery%20and%20(re)selection.docx) UE to UE relay discovery and (re)selection NEC Corporation discussion NR\_SL\_relay\_enh-Core

[R2-2211849](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211849%20Relay%20selection%20and%20reselection%20triggers-v2.doc) Relay selection and reselection triggers Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211933](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211933.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2212025](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212025%20Discussion%20on%20L2%20UE-to-UE%20relay%20v2.0.docx) Discussion on L2 UE-to-UE relay Lenovo discussion Rel-18

[R2-2212159](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212159.doc) Remaining issues on relay discovery and (re)selection for U2U relay Spreadtrum Communications discussion Rel-18

[R2-2212207](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212207%20Discussion%20on%20integrated%20U2U%20relay%20discovery.doc) Discussion on integrated U2U relay discovery Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212275](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212275_SL%20Relay%20Discovery%20and%20(Re-)Selection.docx) SL UE-to-UE Relay Discovery and (Re-)Selection Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

[R2-2212301](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212301_U2U_relay.docx) Considerations for U2U L2 relay operations Kyocera discussion

[R2-2212320](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212320%20Relay%20(re)selection%20for%20UE-to-UE%20relay.docx) Relay discovery and (re)selection for UE-to-UE relay MediaTek Inc. discussion Rel-18

[R2-2212321](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212321%20Connection%20management%20and%20procedures%20for%20L2%20UE-to-UE%20relay.docx) Connection management and procedures for L2 UE-to-UE relay MediaTek Inc. discussion Rel-18

[R2-2212404](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212404%20Further%20considerations%20on%20U2U%20relay.docx) Considerations on U2U relay (re)selection Nokia, Nokia Shanghai Bell discussion Rel-18

[R2-2212508](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212508%20Further%20U2U%20relay%20discovery%20reselection.docx) Further discussion on U2U relay discovery and relay selection Beijing Xiaomi Mobile Software discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212519](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212519-Relay%20(re-)selection%20and%20discovery%20for%20UE-to-UE%20relay.docx) Relay (re-)selection and discovery for UE-to-UE relay LG Electronics France discussion Rel-18

[R2-2212561](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212561_U2U_relay_reselection.doc) UE-to-UE relay (re)selection Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212610](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212610_AS%20condition%20for%20relay%20discovery%20message%20transmission.doc) AS condition for relay discovery message transmission Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212697](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212697%20Discussion%20on%20U2U%20relay.docx) Discussion on U2U relay CMCC discussion Rel-18 NR\_SL\_relay\_enh

Withdrawn/Not available

R2-2211830 Relay selection and reselection triggers Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core Withdrawn

### 8.9.3 Service continuity enhancements for L2 UE-to-network relay

Inter-gNB direct/indirect path switching; intra-gNB indirect/indirect path switching; and inter-gNB indirect/indirect path switching, to be supported by reuse of solutions for the other scenarios.

[R2-2211786](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211786-Open%20issue%20on%20service%20continuity%20for%20UE-to-Network%20relay.docx) Open issue on service continuity for UE-to-Network relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

Proposal 1: If a new event Z2 is determined to be introduced, only the same measurement quantity is used for event evaluation.

Discussion:

Intel do not think event Z2 is needed; on the particular issue of the proposal, they have no strong view.

LG agree with Intel that Z2 is not necessary.

Nokia also have concerns on Z2, and they think this limitation would be quite restrictive, because normally you have SL-RSRP with the current relay and SD-RSRP with the candidates.

Xiaomi think Z2 has quite a bit of benefit, e.g., for two different candidate relays on different cell edges, and they see that the restriction would interfere with this use case.

OPPO think the threshold-based mechanisms work well and this is more of an optimisation.

Apple also do not think Z2 is useful, but we can revisit it after the reply from SA2.

InterDigital have a concern about the restriction; if we support Z2, they think we should allow for different measurement quantities.

Huawei support Z2 for the same reasons it is used in normal handover; they do not see it as an optimisation. For the restriction, they think it could mean that only SD-RSRP is used for Z2.

vivo also support Z2, and they are open for the quantities.

LG are not sure how to use the same measurement quantity, because the L2IDs may be different between SL-RSRP and SD-RSRP and the remote UE cannot know that the relay UE is physically the same.

ZTE think Z2 is useful when the serving relay is overloaded; it may switch the remote UE to a different relay even though the PC5 link is good. They do not think the restriction is needed.

Proposal 2: If a new event Z2 is determined to be introduced, send an LS to ask SA2 whether the L2 IDs for U2N and U2U Relay can be same.

Proposal 3: Follow the work split: It is left to RAN3 to discuss which RAN node determines the target Relay UE/path type and the exchange information between the source RAN node and taret RAN node.

Discussion:

LG indicate that RAN3 have already sent an LS saying that RAN2 can take the decision on the target relay UE and RAN3 can add the necessary signalling, so RAN2 can discuss that part.

InterDigital understand that RAN3 confirmed their WA from last meeting on the path type and are still discussing the target relay UE.

Huawei also understand that RAN3 will be discussing it tomorrow.

Kyocera think RAN3 are discussing largely about RRC state issues, and they may not be able to decide this on their own.

LG indicate that the RAN3 discussion confirmed the source gNB selects the path type, and regarding the target relay issue, it will be discussed tomorrow; for now it is open from RAN3.

Intel think we do not need to agree on path type, and on the target relay UE we are waiting for RAN3.

Proposal 4: RAN2 does not pursue the following enhancement in Rel-18.

- CHO-like and DAPS like solutions

- Lossless path switching

- Prolonged path switching preparation time due to reconfiguration of the target relay UE for remote UE’s path switching

- Introduce the Allowed-List/Block-List to restrict candidate relay UE’s serving cell

[R2-2212698](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212698%20Discussion%20on%20service%20continuity.docx) Discussion on service continuity CMCC discussion Rel-18 NR\_SL\_relay\_enh

Proposal 1: Ask RAN2 to exclude the potential event Z2: Candidate L2 U2N Relay UE becomes an offset better than serving L2 U2N Relay UE.

Proposal 2: If source gNB makes decision target relay UE, source gNB should sends the ID related information to the target gNB, as Alt 1; if target gNB makes decision target relay UE, the source gNB should send a list of candidate target Relay UE information to the target gNB for selection,without measurement information, as Alt 2.

Proposal 3: RAN2 is suggested to discuss lossless path switching for inter-gNB scenario.

Discussion:

Ericsson think we agreed in Rel-17 that this is not a scenario we need to cover; we can rely on PDCP recovery.

Huawei think we need to consider lossless path switching for inter-gNB, because there are multiple nodes involved; we can reuse the PDCP status reports, but we may have additional forwarding.

InterDigital agree with Huawei. They understand that part of the reason we limited to intra-gNB in Rel-17 was to avoid lossless issues in inter-gNB, and we should progress from that in Rel-18.

Qualcomm wonder if the PDCP status report could be used to address the lossless issue; they understand that in Rel-17 it was not fully addressed and it may not be easy to address the lossless procedure.

Nokia support looking at lossless path switching; they think the Rel-17 mechanism cannot work with inter-gNB.

Apple think lossless path switching should be discussed. LG have a similar understanding.

Ericsson think there is no technical problem with supporting lossless in an inter-gNB case, and the data forwarding issue is a RAN3 concern. They understand that we considered RLF cases as corner cases in the path switch scenario.

Intel think lossless delivery does not need to be considered. They think P4 is also related, and they do not see a reason to mandate network behaviour for this case.

LG interpret from Ericsson’s comment that they think lossless can be supported, but also that the current scheme is sufficient. They think these points could be discussed separately.

ZTE think the Rel-17 mechanism is not workable for inter-gNB. The losses may be because of a bad PC5 link.

Ericsson think there is not a concern with supporting this, but the question is whether we do it based on existing procedures. They understand that RAN3 left it to RAN2. They do not see a technical issue with using the PDCP status report, and they wonder why issues that were corner cases in Rel-17 are not corner cases now.

Huawei think there can be packets not forwarded by the source gNB to the target gNB, and these cannot be recovered.

CMCC intended that the downlink is left to gNB implementation, but the uplink would have some PDCP spec impact.

Ericsson see the concern coming from the expectation that the SDU is discarded based on a lower layer acknowledgement; they think this is incorrect, and we had the same discussion in Rel-17.

InterDigital think there is concern that the existing mechanisms may not work. Huawei have the same view.

vivo prefer that if there is more specification impact in RAN2 we would not support it.

Apple think Rel-17 discussion concluded that we did not have time and we could discuss it in Rel-18, and they think we should give a chance for Rel-18.

OPPO can accept the agreement if it follows Rel-17 principles.

LG suggest we could agree that RAN2 will check whether Rel-17 mechanism can support lossless delivery.

MediaTek think we could have an FFS for whether there is spec impact.

Agreement:

RAN2 will investigate whether providing lossless delivery in DL and UL in the inter-gNB service continuity cases is feasible using Rel-17 mechanisms.

Proposal 4: RAN2 is suggested to discuss the restriction for network implementation for DL and UE implementation for UL in transmitting PDCP entity to avoid data loss.

Proposal 5: It is proposed to agree the overall procedure in Fig.2 as a baseline to support switching from indirect path to direct path under another gNB.

Proposal 6: It is proposed to agree the overall procedure in Fig.3 as a baseline to support switching from direct path to indirect path under another gNB.

Proposal 7: It is proposed to agree the overall procedure in Fig.4 as a baseline to support switching from indirect path to indirect path under another gNB.

[R2-2211280](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211280%20Consideration%20on%20Service%20Continuity%20Enhancements%20for%20L2%20U2N%20Relay.docx) Consideration on Service Continuity Enhancements for L2 U2N Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211399](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211399%20Discussion%20on%20further%20enhancement%20of%20service%20continuity_cl.docx) Discussion on further enhancement of service continuity OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211402%20-%20Service%20continuity%20enhancements%20for%20L2%20U2N%20relaying.docx) Service continuity enhancements for L2 U2N relay Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2211413](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211413_Considerations%20on%20Service%20Continuity%20Enhancement.docx) Considerations on Service Continuity Enhancement NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211535](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211535_Further_Aspects_Inter_gNB_Service_Continuity.docx) Further Aspects on Inter-gNB Service Continuity Ericsson España S.A. discussion Rel-18

[R2-2211607](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211607%20%20Discussion%20on%20service%20continuity.docx) Discussion on Service Continuity Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211631](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211631%20(R18%20SL%20Relay%20WI_AI893%20Service%20Continuity).doc) Open Issues on Service Continuity InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211676](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211676_Remaining%20issues%20on%20service%20continuity%20enhancement%20for%20L2%20U2N%20relay.docx) Remaining issues on service continuity enhancement for L2 U2N relay vivo discussion

[R2-2211698](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211698%20Discussion%20on%20service%20continuity%20enhancement%20of%20L2%20U2N%20relay.doc) Discussion on Service continuity enhancement of L2 U2N relay Apple discussion NR\_SL\_relay\_enh-Core

[R2-2211782](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211782_Considerations%20on%20service%20continuity%20enhancements.docx) Considerations on service continuity enhancements China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211786](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211786-Open%20issue%20on%20service%20continuity%20for%20UE-to-Network%20relay.docx) Open issue on service continuity for UE-to-Network relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2211875](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211875.docx) Discussion on service continuity enhancement Xiaomi discussion

[R2-2211897](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211897%20Service%20continuity%20for%20L2%20U2N%20relay.doc) Service continuity enhancement for L2 U2N relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211934](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211934.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2212026](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212026%20Service%20continuity%20in%20L2%20U2N%20relay%20case%20v2.0.docx) Service continuity enhancements for L2 U2N relay Lenovo discussion Rel-18

[R2-2212155](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212155%20Service%20continuity%20enhancements%20support%20for%20L2%20U2N%20relay.doc) Service continuity enhancements support for L2 U2N relay Spreadtrum Communications discussion Rel-18

[R2-2212253](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212253%20U2N%20relay%20inter%20gNB%20path%20switch%20issues.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-Core

[R2-2212254](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212254%20RSRP%20issue.docx) SL-RSRP and SD-RSRP measurement issues Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212276](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212276%20U2N%20Relay%20UE%20operation%20Threshold%20Conditions%20-%20Impact%20of%20UE%20Mobility%20-%20Toulouse.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-Core R2-2208158

[R2-2212307](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212307_U2N_path_switch.doc) L2 U2N inter-gNB service continuity Kyocera discussion

[R2-2212322](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212322%20Inter-gNB%20path%20switch%20to%20Relay%20UE%20in%20RRC_Idle,%20RRC_Inactive.docx) Inter-gNB path switch to Relay UE in RRC\_Idle, RRC\_Inactive MediaTek Inc. discussion Rel-18

[R2-2212410](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212410%20(R18%20SL%20Relay%20WI_AI893%20Lossless%20Service%20Continuity).doc) Lossless path switching from indirect to indirect/direct InterDigital, Inc. discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212520](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212520-Service%20continuity%20enhancements%20for%20L2%20U2N%20relay.docx) Service continuity enhancements for L2 U2N relay LG Electronics France discussion Rel-18

[R2-2212570](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212570-Discussion%20on%20remaining%20issues%20for%20i2i%20path%20switch.doc) Discussion on remaining issues for i2i path switch Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

Withdrawn/Not available

R2-2211632 Lossless path switching from indirect to indirect/direct InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core Withdrawn

### 8.9.4 Multi-path relaying

Study the benefit and potential solutions for multi-path support to enhance reliability and throughput. Includes the cases where a UE is connected to the same gNB using one direct path and one indirect path via 1) Layer-2 UE-to-Network relay, or 2) via another UE (where the UE-UE inter-connection is assumed to be ideal).

PCell location

[R2-2211208](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211208%20-%20Discussion%20on%20PCell%20location%20for%20Multi-path%20Relay_V2.docx) Discussion on PCell location for Multi-path Relay OPPO, ZTE, Huawei, HiSilicon, MediaTek discussion Rel-18 NR\_SL\_relay\_enh-Core

Observation 1 In [At-119bis][426], there were comments on adopting DC modelling when the issue of PCell location was discussed.

Observation 2 The legacy DC concept cannot handle the scenario where SpCell of one CG = a serving Cell (SpCell or SCell) of another CG.

Observation 3 The legacy sidelink design cannot enable ‘MCG Uu + SCG PC5’ or ‘SCG Uu + MCG PC5’.

Proposal 1 When R2 decide on the applicability of PCell location on indirect path, takes R1/R4 impact into consideration.

Discussion:

Apple wonder how we are going to take the impact into consideration without TUs from RAN1/RAN4; are we going to send an LS with the anticipated impact? OPPO understand that if we try to mandate the PCell on the direct path, there will be no RAN1/RAN4 impact, but if we allow PCell on the indirect path, we would have impact and need to decide how to involve RAN1/RAN4.

InterDigital think we have discussed the DC model from an architectural pov, without necessarily meaning that the PCell should act exactly like the PCell in DC.

vivo have a similar understanding to OPPO; there are three options, only one of which does not involve RAN1/RAN4.

Ericsson also support OPPO’s proposal and think it only makes sense to have the PCell on the direct path.

Xiaomi understand that all companies think that DC modelling should be adopted, because CA modelling is not feasible; so they understand that observations 2 and 3 apply even if the PCell is on the direct path. They wonder what modelling we would use; is it totally new?

Intel wonder if this applies only to scenario 1 or also scenario 2. If the PCell is on the indirect path, they wonder if the gNB would be able to configure which path is used for re-establishment/resume. They think we should not follow the DC modelling exactly but inherit some features, e.g., for duplication.

Apple wonder if this is only for the case that indirect and direct path have the same cell; otherwise there seems to be no problem.

Nokia also wonder what would happen if the indirect path is there, the direct path is not there, and we have defined the PCell on the direct path. They think it does not help to decide not to use the DC model, because anyway we would need to adapt the DC model.

OPPO indicate that the main applicability is if the two paths have different cells, but one problem with DC modelling is when the two paths have the same cell, so one cell of MCG is the same as a cell of SCG. With respect to the question from Nokia, they understand that the indirect path without the direct path is legacy operation with the PCell on the indirect path; we would only be requiring that in multi-path, the PCell is on the direct path.

vivo think is we have only the indirect path, it is not a multi-path case; they understand the implication would be that the network changes the PCell to the direct path when it switches the UE into multi-path operation.

MediaTek agree with OPPO.

Ericsson think there was no agreement to use the DC model, and the question is whether we use it now. They understand that a PCell on the indirect path has no meaning, and if we just keep the legacy PCell concept, it will necessarily be on the direct path.

Qualcomm think the important property of the PCell is that it should be the most reliable one, and in multi-path they expect that will be the indirect path.

CMCC think the simple way would be to focus on where the primary leg is, not on the PCell/SCell distinction.

LG think if the PCell is on the indirect path, we may need to change something for the direct link; we may have some more operations on the direct link to support PCell on the indirect link. So they find the implied proposal to have the PCell only on the direct link to be reasonable. Regarding DC modelling, they think we may not need an agreement not to use it; they find it a useful reference point, and we can focus on the PCell location.

InterDigital agree with Qualcomm and think that if we restrict the PCell to the direct path, we are removing an important use case where the UE is at the edge of coverage.

Nokia think we need to know what PCell functionality should be supported for the indirect path; they understand that the PCell is also there for PUCCH, random access, etc. So they tend to agree with Ericsson and are fine to have the PCell on the direct path only.

Ericsson think we should decouple the conversation between CP signalling and the PCell; if reliability is the issue, the gNB can configure the SRBs on the path it wants, and this also covers the cell edge scenario.

Apple think if the PCell is always on the direct path, we do not necessarily have a primary path concept, which is about the primary RLC entity.

Show of hands:

1 Support PCell on the direct path only - 12

2 Support PCell on the direct or indirect path – 6

Agreement:

Support PCell on the direct path only when the UE is in multi-path operation, for both scenario 1 and scenario 2.

AI summary

R2-2212964 Summary of agenda item 8.9.4 on multi-path relaying (Apple) Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

=> Withdrawn

[R2-2213122](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2213122%20summary%20of%20AI%208.9.4%20Multi-path%20relay_v3.docx) Summary of agenda item 8.9.4 on multi-path relaying (Apple) Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

Easy

Proposal 1 [Easy] RAN2 confirms the following WA for Scenario 2.

• 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. FFS how to configure the mapping.

• Without the adaptation layer over Uu link in scenario 2, a PDCP PDU can be delivered to an intended PDCP entity or RLC entity for support of more than one RB over Uu link e.g. by configuring 1:1 bearer mapping and different Uu RLC channels for relay UE local traffic and relay traffic for PDU delivery.

• Do not specify adaptation layer over Uu link for scenario 2 in RAN2.

Proposal 2 [Easy] How to configure 1:1 bearer mapping and potential spec impact can be discussed in normative phase.

Proposal 3 [Easy] In principle, Mode 1 RA can be supported for the remote UE configured with multi-path in Scenario 1.]

Discussion:

Apple observe that P6 is not needed in light of the previous discussion.

Ericsson think there might be RAN3 impact to P3, in case of CU-DU split architecture.

LG understand that mode 1 operation was already specified in previous releases, so any RAN3 issue should have been already solved.

Apple have the same understanding as LG and think we are not introducing anything new.

Ericsson think there could be an inter-DU case with the two paths connected to different DUs.

Samsung think with P1, we will discuss how to differentiate the scenarios in normative phase, since scenario 2 does not support SRAP. Nokia have the same understanding.

Agreements:

Proposal 1 [Easy] RAN2 confirms the following WA for Scenario 2.

• 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. FFS how to configure the mapping.

• Without the adaptation layer over Uu link in scenario 2, a PDCP PDU can be delivered to an intended PDCP entity or RLC entity for support of more than one RB over Uu link e.g. by configuring 1:1 bearer mapping and different Uu RLC channels for relay UE local traffic and relay traffic for PDU delivery.

• Do not specify adaptation layer over Uu link for scenario 2 in RAN2.

Proposal 2 [Easy] How to configure 1:1 bearer mapping and potential spec impact can be discussed in normative phase.

Proposal 3 [Easy] In principle, Mode 1 RA can be supported for the remote UE configured with multi-path in Scenario 1.]

Proposal 6 [Easy] If case B and case D are not supported for Scenario 2, PCell is always on the direct path for Scenario 2.

Proposal 7 [Easy] R2 confirms that split SRB can be configured with or without duplication as in legacy as a baseline. Further restrictions can be discussed in normative phase.

Proposal 13. [Easy]For scenario 2, non-split SRB1/2 is allowed to be configured on direct path.

Discussion:

Nokia think we should remove “as in legacy” in P7. Apple this this is OK but the need is not clear.

Intel wonder on P13 if it means “only allowed to be configured on direct path”. Apple indicate there are other proposals on this (13a and 13b) that were more contentious, and the proposal does not mean “only”.

On P7, Intel think we should add “for scenario 1 and scenario 2”.

Agreements:

Proposal 7 (modified) [Easy] R2 confirms that split SRB can be configured with or without duplication as a baseline, for both scenarios (assuming it is supported in scenario 2 as proposed elsewhere). Further restrictions can be discussed in normative phase.

Proposal 13. [Easy]For scenario 2, non-split SRB1/2 is allowed to be configured on direct path.

Proposal 14 [Easy] Remote UE storing indirect path configuration and resuming directly into multi-path configuration is not supported for scenario 1.

Discussion:

ZTE ask if “indirect path configuration” means SRAP configuration, PC5 channel configuration, or also the indirect bearer configuration. Chair understands it would apply to all layers. Apple have the same understanding; the main point is not to resume into multi-path.

Xiaomi think the focus should be on the second part.

Huawei understand the original intention was to say that the remote UE will not store the multi-path configuration and use it to resume into multi-path directly. They think we should not exclude configuring multi-path in the RRCResume message. So they prefer the original wording.

Agreement:

Proposal 14 (modified) [Easy] Remote UE storing indirect path configuration (e.g., SRAP and PC5-RLC channel configurations) and resuming directly into multi-path configuration is not supported for scenario 1.

Proposal 16 [Easy] If PCell is on direct path, and CSS for SI is configured within the active BWP, the remote UE can perform direct system information acquisition on PCell as currently specified in 38.331; Besides, dedicated signaling can be used to deliver SIB via SRB1 configured on direct and/or indirect path as currently specified in 38.331.

Discussion:

Ericsson think we should remove the condition about PCell being on direct path.

LG think it should say “active BWP on PCell”.

Xiaomi wonder if we should mix UEs in different states like this. Apple clarify that the first part is also about RRC\_CONNECTED UE, because it has an active BWP.

Agreement:

Proposal 16 (modified) [Easy] If CSS for SI is configured within the active BWP on PCell, the remote UE can perform direct system information acquisition on PCell as currently specified in 38.331; besides, dedicated signaling can be used to deliver SIB via SRB1 configured on direct and/or indirect path as currently specified in 38.331.

Proposal 17 [Easy] 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.

Discussion:

Qualcomm think split is valid, but we may not have SRB1 configured on the alternative path, depending on future proposals.

Nokia somewhat prefer the original text and think it does not block anything. Apple also think the original language is OK.

Agreement:

Proposal 17 [Easy] 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.

Proposal 21 [Easy] Legacy PDCP Control PDU transmission mechanism is reused.

Discussion:

Nokia think we could say the CPDU is not duplicated. They think we only discussed duplication and the other aspects of the transmission mechanism could be discussed.

Apple would prefer to keep the original text and add “e.g., CPDU is not duplicated”.

vivo thought the point was not duplicating the CPDU.

CATT agree with the original form of the proposal.

LG could agree with either version.

OPPO think the modified version is clearer.

Nokia think the original text could imply a primary path concept.

Agreement:

Proposal 21 (modified) [Easy] PDCP Control PDU is not duplicated.

To be Discussed

Proposal 3a [RAN2 to discuss] Whether/how to allocate mode 1 SL resource when PCell is not in direct path.

Proposal 4 [RAN2 to Discuss] Whether PCell location is on direct path only or can be on either path.

Proposal 5 [RAN2 to Discuss] RAN2 discuss the technical justification of Per-CP “Primary path” concept before determining whether to support it or not.

Discussion:

OPPO think we have discussed this issue several times, and they think it is easier to start from the question of concrete functions rather than the “primary path” abstraction.

Xiaomi think many companies have provided some justification; for example, the path can be differentiated by whether SRB1 is configured there or not.

InterDigital think one motivation is that many of the DC procedures depend on the primary path, and if we remove the concept the specification effort may be larger for multi-path in comparison to reusing legacy procedures.

Nokia are not sure the primary path helps much, because the quality of the relay path may be quite dynamic.

Lenovo agree with InterDigital: If the primary path is used, more spec reuse should be possible.

LG wonder if some companies are confusing UP and CP primary path concepts. They understand we still have the UP primary path in any case. For the CP, they think we do not need it.

MediaTek agree with Nokia.

Apple think the CP primary path is for more reliability, and anyway the SRBs can be configured by the gNB, which should be sufficient to give flexibility to configure them on the more reliable path.

Qualcomm are not sure what the concept would really mean in CP, but they agree with LG that we should distinguish clearly from the UP concept.

Intel do not see the need; they agree with Apple’s last comment and think we do not really know what the CP primary path functionality would be.

vivo wonder what is meant by CP primary path; the question is what we need for multi-path to work. They think the concept and wording can be further discussed in normative work.

Agreement:

RAN2 do not define a control plane primary path concept in the study phase; FFS if something needs to be defined in normative work, but it should be driven by functionality and technical benefits.

Proposal 8 [RAN2 to discuss] data volume threshold for split bearer (DRB) is used or not.

Discussion:

Nokia would like to postpone this discussion to the normative phase. Apple are fine to postpone it to normative work.

Proposal 6a [RAN2 to discuss] case B and case D are not supported for Scenario 2.

Proposal 9 [RAN2 to discuss] For Scenario 2, Case E are not supported.

Proposal 10 [RAN2 to discuss] For Scenario 2, whether Case G is supported or not.

Discussion:

Apple indicate that B and D are adding something starting with the indirect path, which most companies did not want to support.

vivo think there were no proposals not to support cases B and D, but to postpone it to normative work.

Ericsson agree with P6a. LG have the same view, and they think if we start to support cases B and D, we would also have to look at starting an RRC connection via the indirect path, which could be different from Rel-17 U2N due to the absence of SRAP.

Nokia have sympathy with LG and think we should downscope the supported scenarios.

Xiaomi think B, D, and E are supported in scenario 1, and the point is that we do not do additional work to support them in scenario 2. Apple think supporting B and D in scenario 2 would go against the SI guidance by requiring additional work specific to scenario 2.

Intel agree with Apple’s view; we agreed that we would always have the direct path available in scenario 2.

vivo think there is no consensus on the amount of work, which is why they wanted to leave this to normative work.

Ericsson think it is clear that these cases are not the intention of scenario 2 but more of a corner case, and we should not put in effort for them.

Xiaomi thought the concern was that there would be extra work or it would be outside the scope.

Ericsson wonder how this would solve the issues raised by LG.

Huawei agree with Ericsson that these cases cannot be supported without additional work.

OPPO think if we support B and D in scenario 1, it relies on PC5-RRC, which is not there in scenario 2.

Nokia agree with the technical issues from Huawei and Ericsson, and they think these cannot be applicable in scenario 2 since we agreed that the direct path is always there.

ZTE think scenario 2 was intended to be simple for implementation, which is why we have no SRAP, and supporting B and D would make things more complicated.

On P10, ZTE wonder if we would allow multiple relay UEs to be available for the remote UE in scenario 2, since we agreed there would be preconfiguration.

InterDigital have a similar understanding to ZTE.

Apple also have a similar view.

Xiaomi share the view that the relationship is static and the remote UE cannot change. CATT also have the same concern.

Ericsson have some sympathy for this case; they think the non-3GPP link can figure out by implementation if it wants to change.

LG have the same understanding as InterDigital, Apple, and others.

vivo agree with Ericsson that the non-3GPP link can handle the change in implementation, and they do not see an assumption that there is no other relay.

Samsung have a similar understanding to Ericsson and vivo.

Apple think the change of relay is controlled by the gNB, and in scenario 2 it is not clear how the gNB would know the relays.

Ericsson think the main technical argument for case G is that the main Uu link may drop quality, and if there is only one relay UE that link may break as well.

InterDigital think the companies saying this can be done are appealing to the non-3GPP link, and they wonder what spec impact there would be to support this. Huawei see that the remote UE would need to report candidate relay UEs and the network would need to configure candidate relays to the remote UE; they think we first need to discuss the whole solution for reporting and configuration of the remote UE.

Agreements:

Proposal 6a [RAN2 to discuss] case B and case D are not supported for Scenario 2.

Proposal 9 (modified) [RAN2 to discuss] For Scenario 2, Case E is not supported.

For Scenario 2, whether to support Case G is discussed in normative phase, but RAN2 will not do additional work to enable it for Scenario 2 over Scenario 1.

Proposal 12 [RAN2 to discuss] Whether SRB1/2 can be configured in different path for Scenario 1

Discussion:

Ericsson think we established that they should both be transferred on the most reliable path. Chair wonders if we should specify the behaviour or leave it to gNB implementation.

ZTE think we can leave the flexibility to the gNB. For example, SRB1 can be configured as a split bearer with duplication while SRB2 is a direct bearer.

vivo wonder what the bottleneck to having SRB2 on indirect and SRB1 on direct would be.

OPPO think in legacy DC operation, we have the path as a per-bearer configuration.

Nokia think the configuration is per-bearer, but there is no necessary use case for different paths; they think it can be up to gNB.

Xiaomi and Apple think this can be postponed to normative phase.

Agreements:

Whether SRB1/2 can be configured in different path for Scenario 1 can be discussed in normative phase.

Whether non-split SRB1/2 is allowed to be configured on indirect path for scenario 2 and whether split SRB1/2 is supported for scenario 2 can be discussed in normative work.

Proposal 13a. [RAN2 to discuss] whether non-split SRB1/2 is allowed to be configured on indirect path for scenario 2

Proposal 13b. [RAN2 to discuss]whether split SRB1/2 is supported for scenario 2

Proposal 15 [RAN2 to discuss] Whether to support Remote UE storing indirect path configuration or not and use it to resume to MP configuration for Scenario 2.

Discussion:

Ericsson think there could be a use case if the UE knows that it needs multi-path for a certain scenario.

OPPO wonder what the indirect path configuration would be for scenario 2, since it is implementation-defined.

LG think we can have the same approach for scenarios 1 and 2.

Ericsson think there is still a mapping between the Uu link and the non-3GPP link that could be maintained.

Apple have some concern about supporting this because the remote UE may change relays and resume on a relay with different capability, and they think there would be additional work on top of solution 1.

ASUSTeK agree with Ericsson and think we could discuss in normative work.

Ericsson think it is not a blocking issue and we should leave room for the WI phase.

InterDigital think there should be a compelling reason to support something for scenario 2 that we excluded for scenario 1.

vivo think this can be discussed in WI phase.

Apple think the only logical conclusion is to not support it.

Agreement:

Remote UE storing indirect path configuration or not and use it to resume to MP configuration in scenario 2 is not supported.

Proposal 18 [RAN2 to discuss] Whether to initiate RRC re-establishment if RLF is detected on a path carrying non-split SRB, or if RLF is detected on a path and alternative path with split SRB is suspended.

Discussion:

Apple indicate this proposal was added late in the discussion, but it seems like the logical behaviour.

Nokia think it is a natural consequence of having reporting on the alternative path.

Xiaomi think there are two conditions, and they wonder if they are equivalent or different.

Huawei wonder if the intention of the proposal is to say that assuming SRB1 is only configured on the indirect link, if there is RLF of the indirect link, UE needs to trigger re-establishment. Nokia understand that in such a case, the UE cannot report the RLF and there is no option except to re-establish.

vivo think we have to be careful, because we have agreed the PCell will only be on the direct path; so this would be a scenario where we have RLF, the PCell is not affected, and we trigger re-establishment. They think more discussion is needed.

OPPO do not fully understand the question from vivo; the current wording of the proposed agreement they think is OK, but they are not sure if there should be an additional restriction related to which path is the PCell.

InterDigital think this should not be a blocking issue. They agree with the spirit of the proposal, and they think the only potential issue is that for multi-path we have not defined what re-establishment really means, and there may be some clarification needed.

Apple think the point is that this remote UE wants to continue with multi-path operation rather than dropping into single-path.

vivo think the implication is that we do not have a restriction on where we can configure SRB1; they think if it is not duplicated, it should be on the PCell, and they think without clarifying this aspect we cannot take such a decision.

Nokia think if there is a critical concern, we can revisit it after discussing the split bearer.

Qualcomm think vivo’s comments make sense.

Proposal 21 [RAN2 to discuss] For triggering IDLE/INACTIVE relay UE to enter CONNECTED state, down select from

-Option 1 (SL-RLC or UP-based approach (excluding SL-RLC1)),

-Option 3 (PC5-RRC approach)

-Option 4( RRCReconfigurationComplete-based approach),

-Option 5 (Discovery/PC5-S based approach)

Discussion:

Apple think we cannot reduce to one option and we may not need to repeat the discussion.

CATT doubt the feasibility of option 1 because the UP will be established after the target relay UE enters into RRC\_CONNECTED.

OPPO think at least option 5 is not feasible, because in model A the discovery message is from relay to remote.

Ericsson think we could exclude option 4, given that we have the direct path and could send the ReconfigurationComplete there. They think it could be resolved on PC5.

InterDigital are sceptical about removing option 4, since it is a legacy procedure; they agree with OPPO that option 5 is the least feasible.

ZTE agree with InterDigital and think for option 4, we do not need to introduce any additional signalling; for option 5, they think maybe the remote UE just establishes the PC5 connection with the relay UE for monitoring paging, and the relay UE does not need to go to RRC\_CONNECTED.

Huawei think option 5 is possible, and we need to distinguish relays supporting only single-path from ones supporting multi-path.

Ericsson also think option 5 is feasible and think we should keep it. For option 4, they think sending the ReconfigurationComplete on the direct path is even more aligned with legacy behaviour.

LG think option 5 is feasible but would prefer an AS solution.

vivo want to clarify that this is just for scenario 1, and they think we could say at least 1, 3, and 4 are considered.

Nokia tend to agree with vivo; we can leave the door open for option 5 and start from 1, 3, 4.

Show of hands (non-binding):

1 AS approach - 18

2 NAS approach - 2

InterDigital think if we want to support a NAS-based solution, it should come from SA2.

Agreement:

RAN2 will downselect the solution for triggering IDLE/INACTIVE relay UE to enter CONNECTED state from:

-Option 1 (SL-RLC or UP-based approach (excluding SL-RLC1)),

-Option 3 (PC5-RRC approach)

-Option 4( RRCReconfigurationComplete-based approach),

Discovery/PC5-S-based solution can be further discussed if initiated from SA2.

Low priority

Proposal 11 [Low priority]Whether a single procedure can be supported for Case E and Case G.

Proposal 19 [low priority] RAN2 discuss whether/how to handle non-3GPP ideal link failure.

Proposal 22 [low priority] RNA2 to discuss signaling flow diagrams for path addition case A and case B in Scenario 1, based on input from R2-2211788, R2-2211814 and R2-2212699

Proposal 23 [low priority] RNA2 to discuss which option can be supported for reporting Inter-UE association in Scenario 2, when an indirect path is to be added:

Option 1: Remote UE reporting

Option 2: Relay UE reporting (either relay UE is in CONNECTED state or remote UE has triggered relay UE to enter CONNECTED via non-3GPP ideal link).

Agreement:

Multi-path relay study phase is complete and can proceed to normative work from RAN2 perspective, for both scenarios 1 and 2.

The following documents will not be individually treated

[R2-2211207](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211207%20-%20Discussion%20on%20multi-path%20Relay_V1.docx) Discussion on multi-path SL relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211281](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211281%20Discussion%20on%20Multi-path%20for%20Scenario1.docx) Discussion on Multi-path for Scenario 1 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211282](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211282%20Leftover%20issues%20on%20Multi-path%20scenario2.docx) Leftover issues on Multi-path scenario 2 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211403](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211403_Path%20management%20for%20Multi-path%20Relaying_Intel.docx) Path management for Multi-path Relaying Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2211414](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211414_Considerations%20on%20Multipath%20of%20Sidelink%20Relay.docx) Considerations on Multipath of Sidelink Relay NEC Corporation discussion NR\_SL\_relay\_enh-Core

[R2-2211536](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211536_Remaining_Issues_Multipath_Relays_Scenario1_Scenario2.docx) Remaining Issues on Multipath Relays for Scenario-1 and Scenario-2 Ericsson España S.A. discussion Rel-18

[R2-2211537](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211537_PCell_SRB_Handling_Multipath_Relays_Scenario1_Scenario2.docx) PCell and SRB Handling for Multipath Relays in Scenario-1, Scenario-2 Ericsson España S.A. discussion Rel-18

[R2-2211633](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211633%20(R18%20SL%20Relay%20WI_AI894%20MultipathAspects).doc) Design Aspects for Multi-path InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211677](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211677_%20Remaining%20Control%20Plane%20Issues%20for%20Multi-path%20Scenario%201&2.docx) Remaining Control Plane Issues for Multi-path Scenario 1&2 vivo discussion

[R2-2211678](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211678_%20Supporting%20Cases%20and%20Detailed%20Procedures%20for%20Multi-path%20Scenario-1%20and%20Scenario-2.docx) Supporting Cases and Detailed Procedures for Multi-path Scenario-1 and Scenario-2 vivo discussion

[R2-2211699](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211699%20Discussion%20on%20multi-path%20support.doc) Discussion on multi-path relaying support Apple discussion NR\_SL\_relay\_enh-Core

[R2-2211752](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211752%20Discussion%20on%20multi-path%20operation.docx) Discussion on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211783](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211783%20Discussion%20on%20multi-path%20relaying.docx) Discussion on multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211787](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211787%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

[R2-2211788](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211788-Further%20discussion%20on%20multi-path%20relay%20for%20Scenario%201%20and%20Scenario%202.docx) Further discussion on multi-path relay for Scenario 1 and Scenario 2 Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2211814](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211814%20Discussion%20on%20the%20remaining%20issues%20of%20multi-path%20relaying.docx) Discussion on the remaining issues of multi-path relaying ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211815](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211815%20Further%20discussion%20on%20the%20UE%20aggregation.docx) Further discussion on the UE aggregation ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211874](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211874.docx) Discussion on multi-path Xiaomi discussion

[R2-2211935](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211935.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2212027](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212027%20Second%20path%20addition%20and%20failure%20recovery%20for%20Scenario1%20v2.0.docx) Second path addition and failure recovery for Scenario1 Lenovo discussion Rel-18

[R2-2212156](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212156%20Discussion%20on%20multi-path%20relaying.doc) Discussion on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2212323](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212323%20MP%20modelling%20v01.docx) MP modelling MediaTek Inc. discussion Rel-18

[R2-2212562](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212562_C-plane_aspects_of_multi-path.doc) C-plane aspects of multi-path Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212563](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212563_discussion_on_scenario2_of_multi-path_relaying.doc) Discussion on scenario 2 of multi-path relaying Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212699](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212699%20Control%20plane%20issues%20in%20multi-path.docx) Control plane issues in multi-path CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2212700](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212700%20Protocol%20stack%20for%20multi-path.docx) Protocol stack for multi-path CMCC discussion Rel-18 NR\_SL\_relay\_enh

[R2-2212722](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212722%20Multipath%20relay.docx) Support of multipath relay Nokia Korea discussion

[R2-2212737](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212737_Control%20Plane%20aspects%20for%20multi-path%20Relaying_Intel.docx) Control plane aspects for multi-path relaying Intel Corporation discussion Rel-18 NR\_SL\_relay-Core

[R2-2212813](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212813_SLRelay_S1&2_v1.doc) Discussion on common features for scenario 1&2 in sidelink relay enhancement Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212814](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212814_SLRelay_S2_v1.doc) Discussion on specific issues for scenario 2 Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2212866](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212866%20Discussion%20on%20Multi-path%20relaying.docx) Discussion on Multi-path relaying Lenovo discussion NR\_SL\_relay\_enh-Core

### 8.9.5 DRX

Study the gains and, if needed, specify signalling between gNB and relay UE in sidelink mode 2 to assist the determination of the sidelink DRX configuration used for remote UE. This agenda item will be handled at lower priority.

[R2-2212274](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212274_Motivation%20for%20SL%20U2N%20Relay%20DRX%20coordination.docx) Motivation for SL U2N Relay DRX coordination Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

Proposal 1: RAN 2 to define a mechanism to align Uu DRX active time and SL DRX active time for both, U2N Relay UE and Remote UE.

Discussion:

Samsung understand that Rel-17 DRX can be applied to Rel-17 relay operation, and the principle is to have alignment between Uu and PC5 DRX; so they are not sure what is needed.

Nokia have the same understanding as Samsung that it should be handled in sidelink evolution if there is anything to be done.

Apple think the alignment can be done by gNB side without any signalling, so they have some concern about the proposal.

Qualcomm support the proposal; they think for mode 2 there is something missing, because the relay sets the SL DRX and there is no matching of QoS profiles.

MediaTek agree with Samsung and Nokia and think it can be supported in Rel-17.

Lenovo also tend to think the existing mechanism should work.

Sony think it is clearly in Rel-18 relay WI scope.

LG think there is no consensus at this moment; they do not support enhancements from company perspective, but from rapporteur perspective they see no consensus for supporting an enhancement. They also indicate that there is a DRX objective in the WID.

ZTE think the Rel-17 mechanism can support DRX for the relay and we do not need to consider optimisations.

Huawei think the proposal is generic, and there should be specific issues if we have something to discuss.

vivo agree with others; they think the issues mentioned by Qualcomm can be left to gNB and relay UE implementation.

Intel do not see the need for any enhancement, and they agree with vivo about the issues raised by Qualcomm.

Qualcomm indicate that only mode 1 can be controlled by the gNB, and for mode 2, the relay UE only knows the PDB, which is not enough to set SL DRX. They suggest that we allow the gNB to set SL configuration for mode 2.

Xiaomi think there is something to be done for mode 2 within the scope of the WI.

[R2-2211700](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211700%20Discussion%20on%20SL-DRX%20for%20L2%20relay.doc) Discussion on SL DRX for L2 Relay Apple discussion NR\_SL\_relay\_enh-Core R2-2209774

[R2-2211754](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211754%20On%20sidelink%20DRX%20for%20L2%20U2N%20relay.doc) On sidelink DRX for L2 U2N relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2211789](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211789-SL%20DRX%20for%20L2%20U2N%20relay.docx) SL DRX for L2 U2N Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2211876](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211876.docx) Discussion on SL DRX in U2N relay Xiaomi discussion

[R2-2211936](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2211936%20Relay_DRX.docx) Discussions on Sidelink Relay DRX Sony discussion Rel-18 NR\_SL\_relay\_enh

## 8.19 R18 Other

Misc Impacts from Other RAN WGs and TSGs (incl MC Enhancements). LS ins for Rel-18 topics that has no RAN WI.

Time budget: 0.5 TU

Tdoc Limitation: -

[R2-2212244](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202211 - RAN2_120, Toulouse\\Extracts\\R2-2212244_(SL Relay).docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202211 - RAN2_120, Toulouse\Extracts\R2-2212244_(SL Relay).docx) On Positioning Support for L2 UE-to-Network Remote UEs Qualcomm Incorporated discussion R2-2210367

[R2-2212372](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202211%20-%20RAN2_120,%20Toulouse\Extracts\R2-2212372%20RelayPos.docx) Relay based Positioning Procedure Ericsson discussion Rel-17